

Федеральное агентство по образованию

Государственное образовательное учреждение
высшего профессионального образования

Воронежский государственный архитектурно-строительный университет

АНГЛИЙСКИЙ ЯЗЫК ДЛЯ СТРОИТЕЛЬНЫХ ВУЗОВ

Учебное пособие для студентов, обучающихся по направлению
270100 «Строительство»

Воронеж 2005

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Г.М., Фомина З.Е.

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270100 «Строительство»

Под общей редакцией профессора Фоминой З.Е.

Воронеж 2005

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Данное учебное пособие предназначено для студентов архитектурно-строительных вузов всех специальностей. Основной целью пособия является подготовка студентов к практическому владению английским языком в сфере профессионально-ориентированного чтения и перевода соответствующей научно-технической литературы по специальности. Практические упражнения, содержащиеся в учебном пособии, нацелены на адекватное развитие и закрепление навыков перевода, необходимых для восприятия и понимания научно-технических текстов, подготовку устного и письменного реферирования текстов по специальности, усовершенствование дискуссионных навыков, развитие и закрепление навыков коммуникативного поведения и выполнение креативных заданий.

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Предисловие

Пособие предназначено для студентов строительных вузов всех специальностей, продолжающих изучать английский язык в 1 – 4 семестрах, имеющих по учебному плану 340 часов, из них 170 аудиторных занятий и 170 часов внеаудиторной самостоятельной работы.

Необходимость написания данного учебного пособия «Английский язык для строительных вузов» объясняется прежде всего малочисленностью учебной литературы, которая предназначается для студентов строительных вузов, обучающихся по следующим базовым специальностям: *Промышленное и гражданское строительство, производство строительных материалов и конструкций, строительные и дорожные машины и оборудование, автоматизация технологических процессов в строительстве, архитектура, теплогазоснабжение и водоотведение, автомобильные дороги, пожарная безопасность, экономика и управление на предприятии.*

Аппарат данного учебного пособия включает *аппарат организации усвоения материала* (вопросы, предтекстовые и послетекстовые упражнения, тесты), *аппарат ориентировки* (введение, предисловие, заключение, оглавление, библиографические списки, словари, систему рубрикаций и шрифтовых выделений, сокращения и условные обозначения) и *аппарат издания в целом* (титульный лист, аннотация и выходные сведения).

Отбор текстового материала обусловлен тематикой в соответствии с требованиями Программы по английскому языку для студентов, обучающихся строительным специальностям.

О структуре и о пользовании учебным пособием. Пособие состоит из 10 разделов: *Industrial and Civil Engineering* (Карнова Л.В.), *Builddding Materials* (Ликутова Г.М., Кудинова Ю.С.), *Mechanical Engineering* (Кочнева М.Г.), *Automation of Technological Process and Production* (Меркулова Н.В.), *Architecture and the Architect* (Рыжков О.И.), *Road Engineering* (Крячко Л.Н.), *Heating and Air Conditioning* (Топоркова Е.Н.), *Water Supply and Water Disposal* (Топоркова Е.Н.), *Fire Safety in Building* (Нестерова О.Ф.), *Economics Today* (Лукина Л.В.). Пособие содержит краткий грамматический справочник. В подготовке всех вышеуказанных разделов принимала участие доктор филологических наук, профессор, зав. кафедрой иностранных языков ВГАСУ Фомина З. Е. Активным соредактором данного учебного пособия является доцент кафедры Лукина Л.В.

Каждый раздел включает три текста (Text A, Text B, Text C) по специальности, соответствующей наименованию раздела. Каждая строительная специальность репрезентируется иллюстративной картинкой, служащей своеобразным символом того или иного строительного профиля.

Первые три текста нацелены на формирование у студентов навыков и умений научно-технического перевода. Каждый текст предваряется описанием соответствующей специальности, указанием конкретной учебной темы, *перечнем* грамматического материала, который будет изучаться в рамках работы над текстом.

Далее к учебному тексту предлагаются *вводные* практические задания, цель которых состоит в формировании (или репродукции) *фонетических* навыков, стимулировании *ассоциативных смыслов*, связанных с соответствующей специальностью (ассоциограмма), развитии специальных *научно-технических коммуникативных* навыков.

Следующий фрагмент учебного пособия содержит *англо-русский терминологический словарь*, ориентированный на соответствующую специализацию обучаемых. Словарь должен помочь обучаемым активизировать специальную (строительную) лексику и успешно справиться с переводом текста. В целях интенсивного усвоения лексического минимума в Словаре. Каждая часть речи сопровождается соответствующей грамматической характеристикой.

Затем обучаемым предлагаются *практические упражнения* различного характера: лексико-стилистические, грамматические, коммуникативные, а также упражнения, нацеленные на обучение технологии перевода научно-технических (строительных) текстов. В каждом разделе присутствуют *тестовые задания*, цель которых состоит в верификации и закреплении пройденного материала.

При успешном выполнении вышеуказанных методических этапов работы студентам рекомендуется *ознакомиться с текстом А (Text A)*. (Тексты большого объема в целях более детального анализа подразделяются на отдельные абзацы). Каждый текст сопровождается большим перечнем специальных практических заданий, цель которых заключается в детализированном и многоаспектном анализе-разборе аутентичного текста по специальности.

Тексты *А, В, С* располагаются по принципу от простого к сложному. В работе над *текстами В, С*, следующими после текста *А*, сохраняется адекватная методико-дидактическая стратегия анализа и техники перевода, соблюдается последовательность следующих друг за другом этапов работы: *вводные упражнения, Словарь, предтекстовые задания, текст, послетекстовые упражнения*. Однако существенное отличие послетекстовых заданий (после текстов *В, С*) заключается в степени сложности и усовершенствовании техники перевода, а также практической реализации коммуникативных навыков. Одна из главных целей практических заданий заключается в формировании навыков *устного и письменного реферирования научно-технического текста*.

В каждом разделе даны *коммуникативно-грамматические клише*, которые должны использоваться при пересказе и реферировании соответствующих текстов.

Следующую часть раздела представляют *тексты по специальности для самостоятельной работы*, при анализе которых обучаемые должны практически продемонстрировать свои навыки и умения, приобретенные ими при работе с текстами (*А, В, С*). В частности, они должны использовать все методические приемы устного и письменного перевода.

Заканчивается каждый раздел *Списком основной и дополнительной литературы* по конкретной специальности.

В целях успешного усвоения грамматического материала пособие снабжено *кратким грамматическим справочником*, находящимся в конце пособия.

Учебное пособие содержит *Заключение*, в котором представлены обобщения, рекомендации по дальнейшему обучению английскому языку как языку строительных специальностей. Оно имеет прогностический характер, так как ориентирует обучаемых на перспективные возможности использования английского языка в их будущей профессионально-практической деятельности.

Аппарат организации усвоения материала позволяет, на наш взгляд, рассматривать учебное пособие как руководство, как средство для эффективного овладения учебным материалом.

Аппарат ориентировки как элемент учебного пособия позволяет обучаемому самостоятельно работать с пособием и дополнительными материалами. В издании представлена как основная, так и дополнительная литература по специальности, предлагается большое количество практических упражнений и тестовых заданий, приведено достаточно много примеров, служащих образцами для выполнения тех или иных заданий.

Составителями данного учебного пособия являются преподаватели кафедры иностранных языков Воронежского государственного архитектурно-строительного университета, которые в течение многих лет, преподавая английский язык в строительном вузе, накопили большой практический методико-дидактический опыт преподавания английского языка в неязыковом (строительном) вузе, в том числе в сфере научно-технического перевода и реферирования специальных текстов (текстов по строительным специальностям).

Коллектив кафедры выражает большую благодарность ассистентам кафедры иностранных языков Кудиновой Юлии Сергеевне и Базилевской Александре Олеговне за большую техническую помощь, связанную с подготовкой учебного пособия к печати.

Надеемся, что данное пособие окажет Вам практическую помощь в изучении английского языка и использовании полученных знаний, сформированных умений и навыков в Вашей будущей профессиональной деятельности.

Ваши отзывы и предложения присылайте по адресу:

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ВВЕДЕНИЕ

Данное учебное пособие представляет собой одно из немногих учебных пособий, изданных в нашей стране за последние 15-20 лет, которые предназначены непосредственно для студентов, изучающих *английский язык в строительных вузах*.

Стремительное развитие международных связей в условиях глобализации всех сфер общественной жизни, обширный двусторонний поток научно-технической информации, совместные проекты российских и зарубежных крупных строительных корпораций, строительных фирм, совместные научно-исследовательские Программы делают необходимым конкретизировать цели и задачи обучения иностранному языку как в целом в российских высших школах технического профиля, так и в строительных вузах, в частности, с учетом их многопрофильной ориентации. В связи с этим важнейшая роль отводится прежде всего обучению *профессионально -ориентированной коммуникации* молодых специалистов, включающей развитие и закрепление не только *языковой*, но и *профессионально-коммуникативной* компетенции обучаемых.

Практическое владение английским языком в сфере строительства предполагает, с одной стороны, адекватное владение фонетической, лексической и грамматической базой английского языка, восприятие и понимание текста по строительной специальности, развитие и закрепление навыков прямого и обратного перевода, подготовку устного и письменного реферирования текста по специальности, в том числе, чтение соответствующей литературы по профилю, с другой стороны - в сфере устной речи и межкультурной коммуникации в соответствии с Госстандартом образования.

В предлагаемом учебном пособии " Английский язык для строительных вузов" представлен актуальный учебный материал по всем основным профильным специализациям строительных вузов": *"Промышленное и гражданское строительство", "Производство строительных материалов и конструкций", "Строительные и дорожные машины и оборудование", "Автоматизация технологических процессов в строительстве", "Архитектура", "Теплогазоснабжение и водоотведение", "Автомобильные дороги", "Пожарная безопасность", "Экономика и управление на предприятии"*.

Дидактическая обработка текстов в значительной степени способствует адекватному восприятию содержания учебного материала обучающимися.

С методико-дидактической точки зрения учебное пособие отличается тщательностью и последовательностью структурного оформления. Дидактическая четкость построения учебного пособия является в известной степени надежным базисом для работы над большим учебным

материалом, представленным в пособии и связанным с будущей профессией молодых специалистов.

Предлагаемое учебное пособие позволит обучаемым приобрести навыки профессионально-ориентированной устной и письменной коммуникации на английском языке, будет способствовать их конкурентоспособности в условиях современной рыночной экономики, в условиях внедрения основных положений Болонского соглашения в учебный процесс, откроет новые перспективы карьерного роста молодых специалистов.



Unit I

Industrial and Civil Engineering

Speciality:	Industrial and Civil Engineering
Grammar:	Modal Verbs, Active and Passive Verb Forms, Comparatives, Noun Combinations, Word building, Simple Tenses

What do builders do?

Builders are the key men to create working facilities and living space for the population using late building materials and techniques. They realize bold ideas in municipal and federal projects as new housing estates, modern highways, slender bridges, leisure and educational facilities, industrial buildings, hydraulic engineering structures, shopping centres. Many of them are really worthy of admiration as the visible sign of the new culture and way of life.

People today are provided with better modern conveniences than before. Builders give us a sense of beauty and great pride of man's significance. The demand for builders' services will continue at a high level for many years to come.

What's your opinion about builders' services? Is construction very prestige? Why do you think so?

Text A. Some Basic Problems in Construction.

Vocabulary

1. research [rɪˈsɜːtʃ], n	научное исследование
2. not to keep pace with, v	не отставать от
3. engineering problems, n	строительные проблемы
4. behaviour [beɪˈheɪvjʊə], n	поведение
5. service conditions, n	условия эксплуатации
6. to provide for [prəˈvaɪd], v	обеспечивать
7. crack [ˈkræk], n	трещина
8. shrinkage [ˈʃrɪŋkɪdʒ], n	усадка
9. plain [ˈpleɪn], adj	неармированный
10. reinforced [ˈrɪɪnˈfɔːst], adj	армированный
11. cast-in-place = in – situ, – adj	монолитный
12. structural materials, n	конструкционные материалы
13. precast [preɪˈkæst], adj	сборный
14. prestressed [preɪˈstrest], adj	преднапряженный
15. flexibility [ˈfleksɪˈbɪləti], n	гибкость
16. opportunity [ˈɒpəˈtjuːnɪti], n	возможность
17. investigation [ɪnˌvestɪˈgeɪʃn], n	исследование
18. conception [kənˈsepʃn], n	понимание, понятие
19. composite construction, n	составная конструкция
20. to reduce [rɪˈdʒʊs], v	уменьшать
21. to handle [ˈhændl], v	доставлять
22. productivity [ˈprɒdʌkˈtɪvɪti], n	производительность
23. delivery [dɪˈlɪvəri], n	поставка
24. working operations, n	производственные операции
25. supervision [ˈsʊpəˈvɪʒn], n	надзор
26. schedule [ˈsedʒl], n	график
27. job site, n	строительная площадка
28. employment [ɪmˈplɔɪmənt], n	работа, занятость
29. indispensable [ˈɪndɪsˈpensəbl], adj	необходимый
30. staff [stɜːf], n	штат, персонал
31. to assume [əˈsjuːm], v	брать
32. function [ˈfʌŋkʃn], n	функция

Task 1. Read and translate text A “Some Basic Problems in Construction”.

1.1. Text A: “Some Basic Problems in Construction”

Though civil engineering has solved many problems, problems demanding an engineering solution still remain in construction.

The need for research. Without research modern industry could not keep pace with the ever changing demands for new materials, greater economy and faster operations. It is research that has helped in the solution of many engineering problems. Only research gives the answers to the problem of behaviour of structures under service conditions and provides detail information for design purposes.

Subjects for research in construction may include concrete cracks, the creep and shrinkage characteristics of concrete, deep foundations, methods of prestressing, etc.

Site investigations are needed as a basis for the preparation of plans for a given project. They provide the information for economical design of foundations for buildings.

Soil stabilization is also of great importance for engineers.

Building materials. Of the various structural materials concrete plain or reinforced, cast-in-place, precast or prestressed is the material most favoured by architects and engineers for structures to show all the technical and economic advantages. They are: flexibility in design, speed of construction, structural strength.

New methods in prestressed concrete construction offer the greatest opportunities for further investigation, new conceptions and new forms.

Composite construction. A popular and excellent form of construction is that using a prestressed concrete unit combined with an in-situ top. By this means the amount of prestressed concrete is reduced, handling problems are simplified. This type of construction has become standard for bridges and house - building.

Productivity in construction depends upon many factors. They include important areas of construction activity, the design of structures, the schedule of deliveries and the working operations, the supervision of work, the flow of materials to job site and the skill of the workers.

The market for the services of the construction industry is widening. The increasing productivity lowers costs and provides for more employment for construction and working trades.

Specialists. Today the majority of construction firms have qualified and competent engineers on their staff if their operations are to be carried out efficiently and economically. Engineering operations are varied and extensive. Men of all levels of training and competence may be required to perform engineering activities. The work of a draftsman, a toolmaker, a plant operator is indispensable but does not require the imagination.

Specialists take decisions and assume responsibilities for the result.

Engineers do have their problems and solve them in the most economical and safest way.

The more knowledge specialists have of different materials and of the functions to which they put structures, the better buildings will be.

Exercise 1. Read the definitions of the following words and word combinations and memorize them.

Engineering -	наука или профессия инженера; строительство.
Industrial engineering -	промышленное строительство. Возведение и реконструкция заводов, цехов и различных предприятий и материального производства.
Civil engineering -	гражданское строительство; Возведение жилых, общественных, торговых и других гражданских зданий.
Research -	научное исследование. Детальное изучение предмета или темы для получения новых фактов и данных
Site investigations -	изыскания. Геодезические исследования места строительства, его размеров и т.д. для получения данных о возможности строительства.
Prestressed concrete -	преднапряжённый бетон. Строительный материал с новыми свойствами. Его получают натяжением арматуры специальным оборудованием и заливают бетоном.
Composite construction -	составная конструкция. Её получают сочетанием преднапряжённого элемента с монолитной верхней частью.
Schedule -	график поставок строительных материалов и доставки рабочих на стройплощадку.

Job site -

стройплощадка.

Productivity of labour -

производительность труда.

Способность человека создавать условия для увеличения выпуска строительных материалов и сокращения сроков строительства.

Exercise 2. Put the given words - *decisions, factors, problems, solution, forms* - into the gaps.

1. Civil engineering has solved many important ...
2. It is research that has helped in the ... of various problems.
3. Productivity in construction depends on many ...
4. New methods in prestressed concrete construction offer new ...
5. Specialists take competent ...
6. Composite construction has become the dominant ... for modern bridges.
7. Civil engineers do have their ... and solve them successfully.
8. Only the research opens the ..., which influence the behaviour of structures under load.
9. Reinforced concrete demonstrates new ..., speed of construction and durability of structures.
10. Demands for new materials with greater economy require non-standard...

Exercise 3. Match the following words and word combinations from two columns.

- | | |
|-------------------------|-------------------------------|
| 1. structural materials | a. условия эксплуатации |
| 2. construction project | b. новые методы |
| 3. productivity | c. возможности |
| 4. new methods | d. строительный объект |
| 5. opportunities | e. экономическое преимущество |
| 6. service conditions | f. конструкционные материалы |
| 7. economic advantage | g. производительность |

Task II. Remember that modal verbs show the speaker's attitude toward the action which is usually considered as possible, obligatory, necessary or uncertain.

Can expresses:

1) physical or mental ability

for example:

Can you speak English well? – Вы хорошо говорите по-английски?

2) possibility

for example:

I can't see the chief engineer today. – Я не могу увидеть главного инженера сегодня.

***Must* expresses obligation.**

for example:

One must do his duties. – Каждый должен выполнять свои обязанности.

Students must always come to the University on time. – Студенты обязаны всегда приходить в университет вовремя.

***May* expresses:**

1) permission

for example:

May I write to you? – Можно мне написать вам?

2) reproach

for example:

You might be more active during discussion. – Вы могли бы быть более активны во время обсуждения.

Exercise 4. Find modal verbs in the text and explain their meanings.

For example:

Subjects for research may include concrete cracks, methods of prestressing etc.
may include – могут включать

Exercise 5. Put the modal verbs-*can, must, could, are to, may* - into the gaps.

1. Without research modern industry ... not keep pace with the changing demands for new materials, greater economy and faster operations.
2. The technical and economic advantages of prestressed concrete ... be fully utilized.
3. Specialists ... solve engineering problems in construction.
4. Faster operations ... to be carried out efficiently and economically.
5. People of different levels of training and competence ... be required to perform engineering activities.
6. The engineer ... combine a thorough knowledge in his field of service with high ethical and professional standards.
7. Experience is also important. It ... only be acquired with time.
8. This work ... be done quicker and at low cost.
9. No one ... say what his next building ... look like.
10. New construction ... reflect the modern age.

Task III. Learn the information about the Passive Voice.

To be + Past Participle

We use a passive verb form to say what happens to the subject.

Who or what causes an action is often unknown. But if we want to say who does or causes the action, we use by...

For example: The academic year is divided into two terms. – Учебный год делится на два семестра

You are always waited for. – Вас всегда ждут.

The plan was carefully worked at. – План был тщательно разработан.

Exercise 6. Underline the sentences in the Passive Voice and translate them into Russian.

1. One of the basic problems in construction is financial.
2. This hotel was built two years ago.
3. Engineering operations are varied and numerous.
4. A new research was carried out successfully.
5. Productivity in construction depends upon many factors.
6. Engineering problems will be solved using new building materials and techniques.
7. Builders are the key men to create living space for the population.
8. Precast concrete is widely used in all types of construction.
9. Many building materials have excellent fire-resistance and durability.
10. The demand for builders' services will continue for many years to come.

Exercise 8. Use the verbs in brackets in the Present, Past or Future Simple Passive.

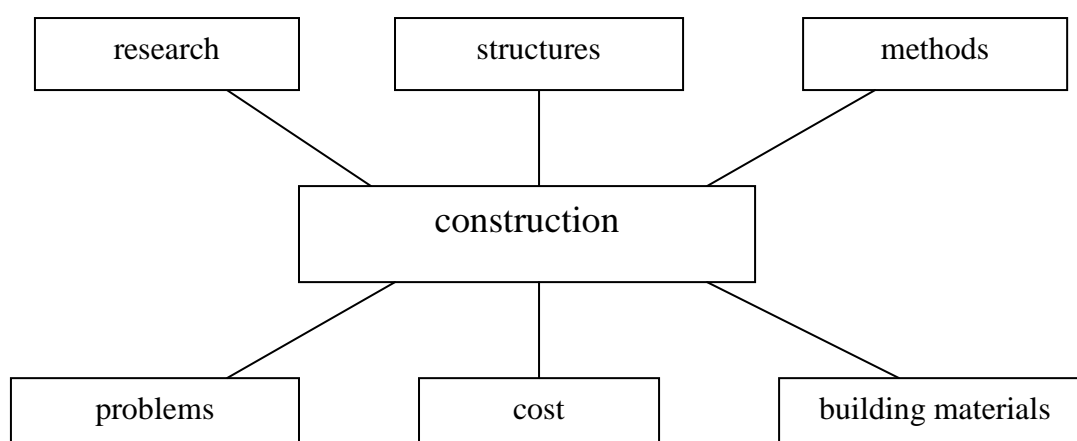
1. Site investigations (to need) as a basis for the preparation of plans for a given project.
2. The amount of prestressed concrete in units (to reduce) not long ago.
3. Handling problems (to simplify).
4. More structural materials (to use) in modern structures.
5. Qualified and competent engineers (to require) everywhere.
6. New striking buildings (to see) everywhere in many cities.
7. Quality of individual home design (to pay) much attention to.
8. The monotony of earlier building (to avoid) now.
9. What (to include) current projects?
10. Men of all levels and training and competence (to need) to perform engineering activities.

Exercise 9. Translate the following sentences into English.

1. Проблемы, требующие технического решения, ещё остаются в строительстве.
2. Только научное исследование даёт ответы о поведении сооружений в условиях эксплуатации.
3. Строительные операции разнообразны и многочисленны.

4. Преднапряжённый бетон предлагает огромные возможности для дальнейшего исследования и новых форм.
5. Многие фирмы имеют компетентных специалистов для реализации смелых замыслов.
6. Специалисты принимают решения и несут ответственность за результат.
7. Производительность в строительстве зависит от многих факторов.
8. Это – проектирование сооружений, графики поставок материалов, контроль над выполнением производственных операций.
9. Темами для научного исследования могут быть усадочные трещины, методы предварительного напряжения арматуры, фундаменты глубокого заложения.

Exercise 10. Study the scheme to understand what aspects the term "*construction*" includes and how they are connected.



Exercise 11. Answer the following questions.

1. What is the text about?
2. Why is research so important for construction?
3. What methods of construction do you know?
4. What are the most important problems in construction?
5. Speak about structural materials.
6. What factors does the productivity of construction depend on?
7. What is the role of specialists in construction?
8. What do builders do?
9. What do they need for qualified work?
10. What municipal projects do you think are really worthy of admiration in Voronezh?

Task IV. Retell the text using all the information you've got about some basic problems in construction. If possible recommend their solutions. Make use of the following phrases:

- I am going to speak about...
- It's a well-known fact that...
- As far as I remember...
- It is necessary to say...
- It got to be known...
- It would be interesting to note...
- In conclusion I'd like to say...
- It would be interesting to note...

Text B. “Engineering and Its Present Status”.

Vocabulary

1. to shape ['SeIp], v -	принимать форму
2. to fit, v -	устанавливать
3. to stand up ['stxnd 'Ap], v -	выдерживать
4. to break ['breIk], v -	разрушать
5. to catch fire ['kxC], v -	загореться
6. to define [dI 'faIn], v -	определять
7. to deal with, v -	иметь дело с
8. to lay the foundation, v -	закладывать фундамент
9. to enable [I 'neIbl], v -	давать возможность
10. execution [ˈeksɪˈkjuːʃn], n -	выполнение
11. engineering techniques, n -	технические средства
12. factual approach, n -	фактический подход
13. strikingly ['straɪkɪŋli], adv -	удивительно
14. bulk of engineering, n -	объем инженерного искусства
15. to allow [q 'lau], v -	предоставлять
16. off-the-shelf approach, n -	стандартный подход
17. to customize ['kAstqmaɪz], v -	выполнять по индивидуальному заказу
18. technical design, n -	техническое проектирование
19. environmental compliance, n -	соответствие с окружающей средой
20. diversity [daɪ 'vʊsɪtɪ], n -	разнообразие
21. affinity [q 'fɪnɪtɪ], n -	близость
22. creative [krɪ 'eɪtɪv], adj -	творческий
23. to expect [ɪks 'pekt], v -	ожидать
24. tailored ['teɪlɔd], adj -	приспособленный
25. selective [sɪ 'lektɪv], adj -	избирательный

Task I. Read and translate the text “Engineering and Its Present Status”.

1.2 Text B: “Engineering and Its Present Status”

Engineering is the art and science by which the properties of matter and energy are made useful to man in structures, machines and products. The basis of engineering is knowledge of the materials used, knowledge of how they are made, how they are shaped, how you fit them together, how they stand up to stress, how they break and how they catch fire. Civil engineering is defined as that phase of engineering which deals with the planning, design and construction of projects. The branch of civil engineering provides for the initial development of natural resources and lay the foundation for other technical progress.

There are greatest opportunities today for civil engineers in construction than at any previous time in the history of our country. These opportunities enable engineer to take a basic part in the conception design and execution of problems which are essential to the growth, development and defense of our country.

The application of engineering techniques to construction makes civil engineering the only factual approach to construction problems.

Engineering is a constantly changing and developing profession. Invention, the adoption of some strikingly new device, method or technique play a part in this continuing evolution.

But the great bulk of engineering consists in doing better something that has been done many times before.

Engineering works have been built for the use and convenience of man. They mark the increasing mastery of man over nature, which has made possible our continuing progress toward a better life.

Engineering tasks nowadays are different from those 10-15 years ago when stable business structures allowed off-the-shelf approach to technical design. Present designs, by contrast, are increasingly customized and might incorporate such factors as regional diversity reflecting a closer understanding of the market and affinity to the needs of society.

Engineering becomes a very creative profession and global markets today demand creativity.

The most creative and elegant engineering solutions are expected from the engineer combining his knowledge of technology with the demands of business, economics and people. The need to develop products and services faster, cheaper and better than ever before is obvious.

Customers are more selective and require production tailored for specific needs, delivered quickly and anywhere with no reduction in quality.

Builders have constructed the tallest, longest, largest and deepest structures in history.

As a result mankind in the 21st century is better off with the proper food, sanitation, housing and all material comforts which modern science, engineering and industry can provide.

Exercise 1. Choose the correct word from the two words given in brackets.

1. Engineering is the art and science by which the properties of matter and energy are made (useless, useful) for man in structures and products.
2. The basis of engineering is (knowledge, skill) of the materials used, their properties and mathematics.
3. Civil engineering deals with (destruction, construction) of various projects.
4. Engineering (works, tasks) have been built for the use and convenience of man.
5. Engineering is a (temporary, constantly) changing and developing profession.
6. There are (more, less) opportunities today for civil engineering in construction than before.
7. Engineering works mark the (increasing, decreasing) mastery of man over nature.
8. Global markets demand (creativity, novelty).
9. The need to develop products faster, cheaper and better is (obvious, premature).
10. (Much, little) is expected of the builders and designers in the future.

Task II. Study the information about comparatives. Comparative and superlative adjectives and adverbs are formed in three ways.

1. with **-er** and **-est** for one-syllable words:
high – higher – the highest
2. with **-ier** and **-iest** for two-syllable words ending in y:
early – earlier – earliest
3. with **more** and **most** before multisyllable words:
intelligent – more intelligent – the most intelligent

Some other ways of comparing are:

As ... as; the same as ... – to express equality (такой же ... как);

Not so ... as – to express inequality (не такой ... как);

Much ...-er than – намного ... чем;

The ... the – чем ... тем (The more you study, the less you know).

Exercise 2. Put the words in brackets in the correct form.

1. She is ... (little) experienced than her friends.
2. Do you think ... (the same as) other members of your group?
3. This article is ... (much difficult) than the previous one.
4. Oxford is one of the ... (old) and (famous) universities in the world.
5. The ... (hard) you work, the (good) the result will be.
6. This problem was ... (little interesting) than I expected.
7. My flat isn't ... big ... yours.
8. That building will be ... (high) in our district.

9. Research opportunities are ... (much wide) today than before.

Exercise 3. Compare and remember the difference in meanings of adjectives and adverbs.

Adjectives	Adverbs	Adverbs with -ly
high – высокий	high – высоко	highly – весьма, очень, чрезвычайно
wide – широкий	wide – широко	widely – очень, значительно
near – близкий	near – близко	nearly – почти
late – поздний	late – поздно	lately – недавно, за последнее время
close – близкий	close – близко, рядом	closely – тщательно
long – длинный, долгий	long – давно	
very – самый, тот самый	very – очень	
only – единственный	only – только	
far – далекий	far – далеко	
hard – трудный	hard - упорно	
real – настоящий		really – действительно
hard – трудный		hardly – едва
large – большой		largely – очень, в основном, главным образом
direct – прямой		directly – сразу, непосредственно
ready - готовый		readily – быстро, легко

Exercise 4. Match the words and their definitions.

- | | |
|-------------------|--|
| 1. to shape | a. particular, certain needs |
| 2. design | b. the work of building |
| 3. to deal with | c. to make the form of something |
| 4. affinity | d. to do business or connection |
| 5. construction | e. close likeness or connection |
| 6. approach | f. a drawing showing how something is to be made |
| 7. specific needs | g. a manner or method of doing something |

Exercise 5. Translate the following sentences into Russian.

- Civil engineering is defined as that phase of engineering which deals with the planning, design and construction of projects.

2. The branch of civil engineering provides for the initial development of natural resources and lays the foundation for other technical progress.
3. Engineering is a constantly changing and developing profession.
4. Engineering works have been built for the use and convenience of man.
5. Builders have constructed the tallest, strongest, largest and deepest structures in history.
6. The application of engineering techniques to construction makes civil engineering the only factual approach to construction problems.
7. The great bulk of engineering consists in doing better something that has been done many times before.
8. The most creative and elegant engineering solutions are expected from the engineer who combines his knowledge of technology with the demand of business, economics and people.
9. Customers are more selective now and require production tailored for specific needs, delivered quickly and anywhere with no reduction in quality.
10. The need to develop products and services faster, cheaper and better than ever before is obvious.

Exercise 6. Do you agree or disagree with the following opinion?

Use the given phrases:

Yes, I think so

I certainly agree with you

I am sure you are right

I don't think so

I doubt it

I disagree (with you)

1. There are less opportunities today for civil engineers in construction than before.
2. The basis of engineering is knowledge of materials used and mathematics.
3. Civil engineering never dealt with planning, design or construction of various projects.
4. Present designs are very simple but interesting.
5. Engineering tasks nowadays are practically the same as 10 - 15 years ago.
6. Our cities should be comfortable and beautiful.
7. The type and style of dwellings in urban areas depend on natural conditions and local traditions.
8. The problem of the house is the problem of the epoch.
9. People and buildings require sunlight and air.
10. New housing is characterized by the wide expense of glazing and the development of public services and communication.

Exercise 7. Insert the necessary word.

1. Construction problems are (simple, mixed, complex).
2. The work of the engineer is predominantly (intellectual, varied, manual).

3. The branch of engineering provides for the initial development of (artificial, natural, fundamental) resources.
4. Engineering works mark the (decreasing, unknown, increasing) mastery of Man over Nature.
5. Engineering becomes a very (conservative, important, creative) profession.
6. Modern science, engineering and industry provide (housing, sanitation, material comforts) for people.
7. The values, potentialities of modern engineering have been most fully (provided, realized, demanded).
8. Builders have constructed the tallest, longest, largest and deepest structures for the (use, convenience, admiration) of man.
9. Engineers today play (little, vital, dominant) role in construction.

Task III. Read and translate the information about Industrial Construction.

Buildings are erected either for housing or for industrial purposes.

Industrial engineering is a complex multifunctional system comprising a very significant type of construction.

Industrial buildings vary in function, structure and volume. So they require their own structural solutions and techniques.

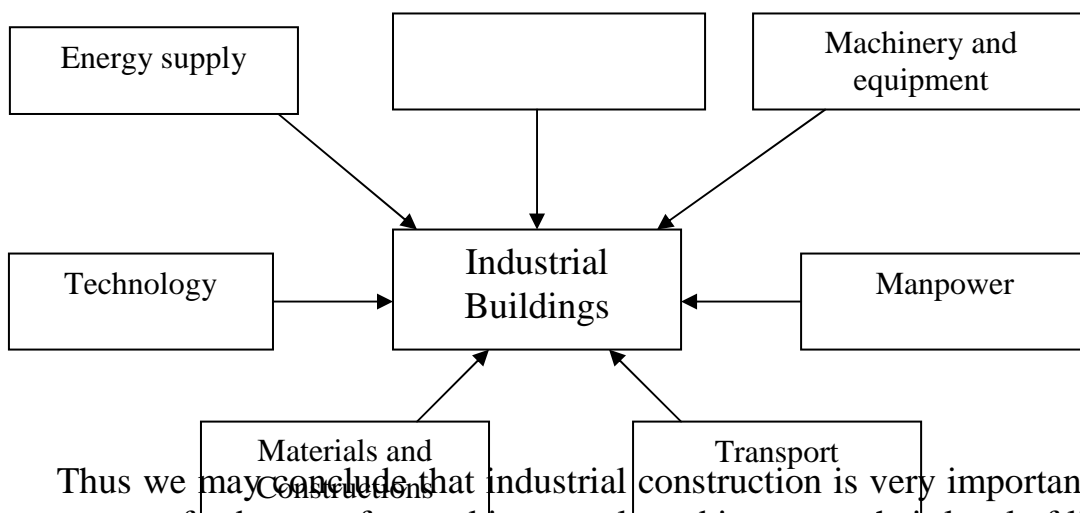
But all of them are intended for producing necessary building materials, metal constructions, machinery and different equipment etc. to develop vital projects.

Besides, industrial structures give places of work to a great number of people.

Current industrial projects include engineering buildings, hangars, shops, offices, factories and plants, storage facilities and laboratories.

Stability and strength of such structures are provided by a well-prepared foundation, the proper choice of building materials and techniques.

The development of industrial buildings is influenced by many factors. Let's analyze some of them.



Thus we may conclude that industrial construction is very important as it gives means of substance for working people and improves their level of living and in the long run, it ensures further economic progress of our country.

Exercise 8. Answer the following questions.

1. What is the information about?
2. What is industrial engineering?
3. What do industrial buildings vary in?
4. What solutions do they require?
5. What are industrial structures intended for?
6. Speak about current projects of industrial construction in Voronezh.
7. What are strength and stability of such structures provided by?
8. Look at the scheme and say what factors usually influence the development of industrial buildings.
9. Can you add more factors?
10. Make a conclusion about industrial construction in Russia.

Task IV. Study the information about the industrial building given below and be ready to describe it.



1. Suppose this building is a future factory. What kind of factory do you think it will be?
brickmaking / glassware / furniture
2. The construction process involves the following: planning, design, construction, maintenance and restoration activities.
What stage of building is shown in figure above?
3. Non-standard design of the factory harmonizes with the surroundings.
Where may it be located?
in the outskirts of the city / in the center of the city / in the remote area
4. Different building materials and modern techniques are used in realization of this project.
What materials and techniques are used in this project?
5. Modern industrial buildings demonstrate the advantages of reinforced concrete panels, metal frames and double-strength glass.
The advantages of what materials does this factory demonstrate?

6. Sum up what you've learned about the industrial building, using the following word combinations:
 - size, location, cost
 - non-standard design
 - construction materials used
 - modern techniques
 - the necessity of this industrial building.

Exercise 9. Complete the sentences using the words from the box to characterize the significance of civil engineering today.

construction, projects, mastery, technology, changing, economics, to develop

1. Civil engineering deals with the planning, design and construction of...
2. There are greatest opportunities today for civil engineers in ... than before.
3. Engineering is a constantly ... profession.
4. The need ... products and services faster, cheaper and better than before is obvious.
5. Engineering works mark the increasing ... of man over nature.
6. A civil engineer must combine his knowledge of ... with the demands of business, ... and people.

Exercise 10. Answer the following questions concerning civil engineering.

1. What is the information about?
2. How is civil engineering defined?
3. What does the branch of civil engineering provide for?
4. Speak about present opportunities for civil engineers in construction.
5. What makes civil engineering the only factual approach to construction problems?
6. Why do you think engineering is really a constantly changing and developing profession?
7. What do present designs incorporate?
8. What does the great bulk of engineering consist of?
9. What is the aim of creating buildings for a man?
10. What housing and material comforts can modern science, engineering and industry provide in the 21st century?
11. Make a conclusion about "Engineering and its Present Status".

Exercise 11. Speak about «Engineering and its present status» using the key words and word combinations.

- engineering as a constantly developing profession
- modern problems in construction

- engineering tasks
- present designs
- demand for engineers' services
- significance of industrial construction

Text C: "New projects: the architect-engineer-contractor team"

Let us, this day and generation,
perform something worthy to be
remembered.
Daniel Webster

Vocabulary:

1. team ['tɪm], n –	бригада, команда
2. to interrelate ['IntWɪleɪt], v -	взаимодействовать
3. triple ['trɪpl], adj -	тройной
4. triangle ['traɪxŋɡl], n -	треугольник
5. objective, n = aim, n -	цель
6. in spite of, prep –	несмотря на
7. to accept [ək'sept], v -	принимать
8. particular [pɑ'tɪkjʊlə], adj -	частный
9. discerning [dɪ'swɪnɪŋ], adj -	проницательный
10. to exist [ɪg'zɪst], v -	существовать
11. mutual respect, n -	взаимоуважение
12. outstanding success, n –	выдающийся успех
13. to coordinate [ko'ɒdɪneɪt], v -	координировать
14. to achieve [ə'tʃɪv], v -	достигать
15. magnitude ['mæɡnɪtɪd], n -	важность
16. to cultivate ['kʌltɪveɪt], v -	культивировать, поощрять
17. final decision, n -	окончательное решение
18. estimate ['estɪmeɪt], n -	смета
19. structural engineer, n -	инженер-проектировщик
20. to be aware of, v -	знать, сознавать
21. owner ['əʊnə], n -	владелец, собственник
22. to secure [sɪ'kjʊə], v -	обеспечивать
23. to suggest [sə'ɡest], v -	предлагать
24. schedule ['sedʒnl], n -	график
25. target ['tɑɡɪt], n -	задача
26. to maintain [meɪn'teɪn], n -	поддерживать, осуществлять
27. spectacular [spek'tɪkjʊlə], adj -	эффективный, импозантный
28. to contribute [kɒn'trɪbjʊt], v -	вносить вклад

Task I. Read and translate text C “New projects: the architect-engineer-contractor team”.

1.3 Text C: “New projects: the architect-engineer-contractor team”.

1. Nearly two thousand years ago the Roman architect Vitruvius listed three basic factors in architecture - *convenience, strength and beauty*.

These factors are actual today. They are always present and are always interrelated in the best structures.

2. The architect, the engineer and the contractor form parts of a triangle all of which are essential to the completion of a construction project. Together they are working towards the same objective - better construction, better materials, better design.

In spite of the increased cost of today's buildings as compared with those of 10 years ago no one would accept a new structure of the older type of design and construction.

One aim, one responsibility, one striking result. The activity of the engineer and the architect in design and construction is of particular interest.

Between competent and discerning practitioners of both professions there exists and should exist a mutual respect for their individual abilities.

In fact no important building project has been an outstanding success without the respective training experience and skill of engineers and architects coordinated towards a common result.

3. The chief function of the architect is to solve a particular problem of construction in such a way as to achieve a structure or structures with proper and harmonious balance of utility, strength, beauty and economy. If the project is of any magnitude the conception takes material form through the skill of the engineer.

In such project the engineer must depend on the planning and skill of the architect; the architect - on the construction skill of the engineer. Thus, engineers and architects can cultivate the mutual respect, which will develop the harmony and solidarity of basic professions. In most cases it is the architect who must make the final decisions based on the contractor's estimates of cost, his faith in the structural engineer and his willingness to take a chance with new construction methods. First the structural engineer must become aware of new developments, must learn how to design the new structure, know the cost of construction and be aware of the esthetic problems of the architect. Then he must suggest structures to the architect, talk with the contractor about them and find their advantages and disadvantages.

4. The following steps are usually taken in putting up a building. The owner, be it a corporation, bank or individual, feels the need for a new building and secures a site. These two fundamental decisions what is to build and where to build are made by the owner, sometimes with architectural or engineering advice.

Then the contractor plans the site layout, prepares the project program, schedules and targets.

The engineer in his turn controls the quality of his structure in two ways - by the specifications he writes into the contract and by the inspection he maintains during construction. These two factors have a significant effect on the productivity of the contractor's organization.

5. As a result of the combined efforts of the engineer, the architect and the contractor, new forms and new methods of construction are developed and three main aims - economic, esthetic and technical, single or in combination, are successfully realized in spectacular building by the architect, the engineer and the contractor, each of which has contributed to this development.

Exercise 1. Find the English equivalents to the following word combinations in the text.

Три основных фактора; образовывать части треугольника; завершение строительного объекта; одна цель; взаимоуважение; деятельность инженера и архитектора; прочность; красота и экономия; компетентный практик; материальная форма; мастерство инженера; новые формы; подрядчик; инженер проектировщик; знать, как проектировать; планировать расположение на площадке.

Task II. Read the following information about noun combinations.

Two or more nouns can be combined in several ways:

1. 's possessive
2. one noun used as an adjective
3. phrases with *of*
4. compound nouns forming one word

Match these examples with the categories above:

- a) brickwork
- b) builders' service
- c) type of construction
- d) job site

1. We use 's to express a relationship between a person and another person or object.

Ann's boss student's life Mr. White's three main objectives

2. When two nouns are used together, the first noun functions as an adjective and describes the second noun.

an office complex construction process

3. Two nouns are joined by *of* when the ideas are more abstract.

the way of life *the cost of living*

4. Some compound nouns are written as one word.

Headquarters *software* *brickwork*

Exercise 2. Find noun combinations in the text and write them under the following four headings:

's possessive / one noun used as an adjective / phrases with of / compound nouns forming one word

Task III. *Skimming* means reading quickly to get the main idea. Skim through the text to understand what it is about.

1. The text is about new projects that characterize modern construction.
2. The information is about the work of the architect, the engineer and the contractor.
3. The text deals with the stages of putting up a building.
4. Give your own variant of the main idea of the text.

Exercise 3. The following suffixes are used to form different parts of speech. Find the words with corresponding suffixes in the text:

Nouns with -ing, -or, -ture, -sion, -tion, -ive, -ity, -ty, -ment, -y, -ness;

Adjectives with -ic, -al, -ant, -ent, -ing, -ed, -ous, -er;

Verbs with -ate, -ize/ise, -fy.

Exercise 4. Say what is special about the nouns and verbs of the following words.

Offer, research, test, matter, house, project, number, concrete, increase, face, conduct, study, conflict, feature, decrease, form, influence, question, dream, change.

Exercise 5. Write in the number of the paragraph that deals with the following topics:

- архитектура - нелёгкое искусство
- деятельность инженера и архитектора
- стадии возведения здания
- появление новых форм и методов строительства

Task IV. *Scanning* means looking for special information in the text. Scan the text to find information on the following topics:

- the chief function of the architect
- the work of the structural engineer
- the result of the combined efforts of the team
- the formula of the success to be remembered.

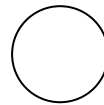
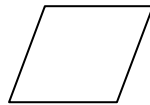
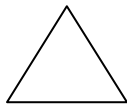
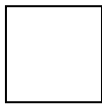
Exercise 6. Choose the key sentence from each paragraph.

1. Vitruvius listed three basic factors in architecture - convenience, strength and beauty.
- 2.
- 3.
- 4.
- 5.

Exercise 7. Write down the key word combinations from the text.

Exercise 8. Answer the following questions.

1. By what geometric figure can you express the interdependence in the work of competent practitioners?



a square [sk 'wFɔ] – квадрат

a circle ['sWkɪ] – круг

a triangle ['traɪxŋɡl] – треугольник

a rhomb [rɒm] - ромб

2. What's your opinion about new projects in Voronezh?
3. Enumerate some of the most interesting projects.
4. How do you appreciate the work of the architect, the engineer and the contractor?
5. What contribution are you going to make when you become a civil engineer?
6. Think of your own questions concerning new projects in Voronezh.
7. What are their advantages and disadvantages?

Task V. *Summarizing* means taking only the essential points of the original without changing their meaning and rendering them in your own words. Study the plan and the given example. Then write your variant of the summary.

Plan

1. Three basic factors in architecture.
2. The role of competent practitioners in creating new projects.
3. The interdependent work of the key men.
4. The advantages of the combined efforts of specialists.

The information deals with a great role of the competent practitioners in solving complicated engineering problems and creating new forms and really beautiful buildings.

They follow three basic and interrelated factors in architecture - convenience, strength and beauty. The architect, the engineer and the contractor form parts of a triangle in their work. They have one aim, one responsibility and work for one striking result. Engineering work is varied and intellectual. The advantages of the teamwork are quite evident:

1. Solving the problems in the most economical and safest way.
2. Flexibility in design.
3. Speed of construction.
4. Structural strength.

Exercise 9. What meaning of the word *intellectual* corresponds best to the context?

1. Concerning the intellect.
2. Able to use intellect well.
3. Showing unusual reasoning powers.
4. A person, who works and lives by using his mind and who is interested in activities, which include thinking and understanding rather than doing.

Task VI. Agree or disagree with the following statement and write an essay of 100-150 words to support your opinion.

The architect-engineer-contractor team is the basis of the engineering know-how in creating new architectural forms.

Texts for self-study and analysis

Industrial and Civil Engineering

Text 1.

Building codes.

Like everything else in this fast-moving world building codes must be kept abreast of the times.

The purpose of a building code is to provide for the safety of the public physical as well as financial.

Society has long demanded and still does a security in the structures it inhabits.

In the Louvre Museum in Paris there is a Babylonian Column dated around 2000 B. C. on which is engraved the building regulations of the period, it reads "if a contractor builds a house for a man and does not build it strong enough and the house which he built collapses and causes the death of the house owner, then the contractor shall be put to death".

Civil engineering structures today tend to be large, costly, mainly static "constructions, which are usually built in small numbers or even singly. They are subjected to varied complex and uncertain loadings which in origin are either geophysical - gravitational, meteorological, seismological or they are man induced due to occupational uses or the construction techniques.

The social pressure for larger, lighter, more unusual and more economic structures despite the conditioned conservatism of the engineer leads periodically to failures.

The causes of structural failure are quite varied. The structures are damaged by fire, by wind loads, due to local overloading. Human errors are caused by 1) lack of ability 55%; 2) lack of experience 45%.

High cost of land in city centres forces developers to build as high as possible.

There are three major factors for consideration in the design of structures - strength, rigidity and stability. In design of tall buildings the structural systems must also meet these requirements.

In order to satisfy these requirements in a structure there are two basic approaches. The first is to increase the size of the elements beyond and above the strength requirement. This approach has its own limit since it may not be practical to increase the size of the Column.

The second approach is to change the form of the element into something more rigid and stable in order to confine the deformation and increase the stability.

For tall modern buildings lateral sway has posed a problem because taller structures are subjected to increasing wind loads and increasing lateral sway at upper levels.

Wind and tall buildings.

The development of design for wind effects on buildings is a continuous evolutionary process.

From the earliest times designers used experience and intuition in designing against wind action.

The Eiffel Tower, for example, was designed on the assumption of a maximum static wind load. In reality the natural wind is always turbulent and produces loads, which fluctuate with time.

Text 2.

Leaning Tower of Pisa.

Why the famous Italian monument completed in the Fourteenth Century is still standing and what might be done to save it.

The Leaning Tower of Pisa may be compared to a building 180 ft high, whose base is at the building line and whose top leans over the sidewalk. Its height is three times its diameter and that it has now become more than 14 ft out of plumb.

Leaning history - The construction of the Tower of Pisa was started in 1174 under the supervision of a Florentine named Bonanno. The foundation consisted of a large ring of masonry about 20 ft wide and about 60 ft in exterior diameter, bearing on the soil, it is believed, only a few feet below ground level. The soil probably consisted of a wet volcanic silt, called, in some accounts fine sand and clay, and if anything had been known at the time about the 'bearing values of soils, the tower would never have been built. No modern building code would assign to such a soil a presumptive value of more than about 1/2 ton per sq ft whereas the actual load under the tower foundation is about 8 tons per sq ft. By the time the equivalent of three stories had been erected, settlement had occurred, and the tower was tilting at an alarming rate. The cities of Florence and Pisa were not too friendly at the time, and ugly rumors of deliberate sabotage began to float around Pisa. Bonanno thought it was about time to leave town - construction was abandoned, and the tower remained three stories high for 60 years.

By that time it had settled into the ground sufficiently to consolidate 'the soil', and temporarily to arrest the settlement. It was with confidence therefore, that Giovanni de Simone decided to finish the tower. As the work progressed, an attempt was made to straighten the structure by adding additional courses of masonry on the low side. Giovanni added another story, and it is believed that the settlement and tilting increased alarmingly. In any case, the work was stopped and Giovanni disappeared.

Nothing further was done for nearly 100 years, by which time continued settlement had developed new consolidation in the soil sufficient to cause the structure again to come to apparent rest. An architect of Pisa named Tomasso, then deciding that it was safe to finish the structure, designed a narrow belfry, made other minor changes in the plans, and proceeded. The structure was finished in 1350, and we have every reason to believe that the settlement and the tilting, accompanied by the consolidation process, has continued over the 600 years.

Text 3.

Arctic Village Under Ice

Local materials, snow and ice, were exploited to the full when United States Army engineers built a village beneath the Arctic icecap in Greenland. The village, 800 miles from the North Pole and completed only a short time ago, is lighted and heated by atomic power.

Known as Camp Century, the project was built by agreement between the U.S. and Danish governments. It is a scientific research laboratory where 100 American scientists and technicians are studying weather conditions.

Greenland is the source of weather for much of the Northern Hemisphere. By drilling into the icecap, samples of ice formed hundreds, or even thousands of years ago, can be brought to the surface and analyzed. In the content and structure of these ice samples, the history of snowfall and weather for many centuries has been preserved, enabling the experts to make fairly accurate predictions on future weather cycles. The camp consists of 21 tunnels in the icecap, criss-crossing each other. Inside these snow tunnels 30 prefabricated wooden buildings have been erected, including research laboratories, living quarters, a water supply system, atomic power plant and virtually every facility needed by a self-sufficient community.

Text 4

Egyptian pyramids have always attracted scientists' attention, who discuss the mystery of their construction. At present some scientists have quite different opinions about it.

Building the Great Pyramid

The Great Pyramid at Giza, built for the Egyptian pharaoh Cheops, is massive yet so precisely built that it has aroused endless speculation about how it could have been made by an ancient society. Historians do not have all the answers, but they are certain that the Egyptian architects had some knowledge of geometry. The pyramid's base is almost a perfect 750-foot square. Its sides are triangular in shape. Its sides are so perfectly laid out that they run almost exactly

from north to south and from east to west. Some believe that the builders used a star as a guide by which to achieve this precise orientation.

The Great Pyramid is made of colossal stone blocks, averaging 2.5 tons each and totaling 6.5 million tons. Each of these blocks was transported and raised probably by some type of ramp, to build a structure 481 feet high. The historian Herodotus estimated that to build the Great Pyramid about 100.000 workers were replaced every three months for a period of 20 years. Others contend that this is a wild exaggeration. However, a huge work force of masons, quarrymen and stonecutters was required to construct the tomb of Cheops.

Text 5

Stones of Pyramids

Twelve years of research in the field of chemistry and archeology have given quite a definite answer about the stones of pyramids. They were made synthetically. Egyptians produced some special solution. Later they mixed it with one of the minerals. It took them several hours to transform this mixture into very hard rock. This rock was produced just on the construction site and so there was need of transporting heavy stones.

Now scientists and engineers know how to produce hard material synthetically. At present similar materials are used in industry. The synthetic rock looks like limestone granite or any other rock.

The Egyptians had a great knowledge of mathematics and chemistry and they could know this technique. The necessary minerals could be found everywhere.

Only the usage of this technique can explain some strange facts. First of all the presence of huge monolithic stones inside the pyramids which are too large for the entrance door and the presence of human hair which is 21 cm long inside one of the stones.

Text 6

London's New Telecommunications Centre

LONDON'S new telecommunications centre, Fleet Building, in Farrington Street, has been designed and erected under the supervision of the Chief Architect's Division, Ministry of Works, to meet the requirements of the General Post Office. Built by Tersons, Ltd., it will house both operational equipment and office staff. Contained in the building is the automatic Telex switching exchange, which gives access to the whole of the United Kingdom, the Continent and other places abroad. Eventually, the building will accommodate the Fleet Street telephone exchange and a further exchange if and when it should be required.

The site of the new building is roughly square in shape and has a frontage of 230 ft to Farringdon Street, 250 ft to Stonecutter Street, and 230 ft to Shoe Lane. The northern boundary of the site is occupied by existing buildings and there is a difference of about 16 ft in the levels of Farringdon Street and Shoe Lane, with a gradient of 1 in 16 to Stonecutter Street.

In plan the building is E-shaped, the 15-floor tower block forming the upright of the E. The lower six floors of the building are 14 ft 9 in. floor to floor and designed to take heavy loading for Post Office equipment; the upper nine floors are 10 ft floor to floor, with lighter office loading. The three lower floors are mainly in basement accommodation.

The plan of the building has been dictated by operational requirements, and a module dimension of 11 ft 5 in. was chosen to agree with Post Office apparatus lay-out. This module runs in both directions and, within each module dimension two window bays have been provided. The irregular dimensions of the northern boundary have been taken up with three staircases, which vary in width.

Height Limit

The Town Planning Authority insisted that the 80 ft height be adhered to in Farringdon Street and the height of the tower, about 165 ft above street level, was dictated by day lighting considerations.

On Shoe Lane the elevations have been set back to accommodate the curve and rise to this frontage; advantage was taken of the boundary wall to place ventilation grilles behind it. The projecting staircase serves the double purpose of providing a stop to the north elevation and also support to the adjoining party wall.

Construction

The superstructure is of reinforced concrete construction throughout, with solid floors in operational areas and hollow tile construction for office floors. Generally, the columns are carried directly on the retaining walls and the foundation slab next to earth. The column spacing externally is 5 ft 8 in., to suit the module construction throughout. Where the construction is hollow tile, a flush soffit appears between the internal spine beam and external columns; in operational areas cross beams span at 5 ft 8 in. centres.

Founded on firm clay the lowest basement level, in the South-West corner, is about 50 ft. The walls of the basement are of semi-mass concrete construction with a maximum thickness of 9 ft. Excavation was by the trench and dumpling method and little water was encountered during these excavations.

Generally, the columns and beams have been left fair-face and not plastered and throughout the job column and pier sizes were standardized. Bored piles were used on the northern excavations where constructional difficulty was experienced with adjoining buildings. Cladding is of Portland stone.

Text 7

With future expansion in mind

The Assumption High School of East St. Louis, Illinois, was built to accommodate 650 students with provisions for expanding horizontally and vertically to provide facilities for an eventual one thousand students.

The school consists of three units: an academic unit containing classrooms; a gymnasium unit including gymnasium, cafeteria, shops, and laboratories; and a Brother's House, independent of the other buildings, which contains living quarters for 24 Brothers. The academic unit has provisions for expansion to the east. In addition, a second floor can be added to the present one story portion. The Gymnasium Unit is designed so that there is sufficient physical education, shop, laboratory, and cafeteria space for additional students if classroom facilities are increased.

Structural Steel was used exclusively in the framing of this new school because of its versatility, its tremendous load bearing capacity, and its economy of use-qualities that make it ideal for all types of school construction. Small wonder that today's architects and engineers are specifying Structural Steel frameworks for more and more schools, churches, and small buildings. Just look at these advantages:

1. Structural Steel is the strongest, yet most economical of load bearing materials.
2. Structural Steel will withstand more abuse than other structural materials, effectively resisting torsion, tension, compression, and shear.
3. Once enclosed in buildings, it lasts indefinitely - requiring no maintenance.
4. Structural Steel may be riveted, bolted or welded ... can be erected in any weather in which men can work.

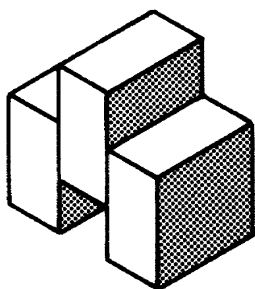
Steel members are fabricated indoors; therefore, weather can have no effect on the quality of workmanship.

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**Unit II****Building Materials**

Speciality:**Building Materials****Grammar:****Indefinite tenses. Active and Passive forms.****Comparative and Superlative degrees of the adjectives.****Modal verbs and their equivalents.**

WHAT DO ENGINEERS – TECNOLOGISTS DO?

Construction is growing from year to year in our great country. This requires the use of new building methods and new building materials which play a very important role in the work of architects and builders. They help to develop modern architecture, speed up construction work and decrease its cost.

To create new building materials the designers and engineers–technologists must take into account the achievements of chemical, mathematical, physical and other sciences. They must be able to select, simulate and adapt such materials of construction that will give the most effective results by the most economical means. In this choice of materials for any work of construction, the technologists must co-operate with other specialists and consider many factors. These factors include availability, cost, physical, mechanical, chemical properties of materials and others. Technical progress is now impossible without high–quality materials. Research in creation of new synthetic materials is conducted on a wide front.

TEXT A. The Basic Problems of a Building Materials Industry

Vocabulary

1.industrial construction [in'dAstriql kqn'strAkS(q)n]	– промышленное строительство
2.facility [fq'siliti], n	– средство, удобство
3.govern , v ["gAv(q)n]	– управлять
4.building industry ['bildiN 'indqstri]	– строительная промышленность
5.durability , n ["djurq'biliti]	– долговечность
6.obtain , v [qb'tein]	– получать
7.search , v, n [sWC]	– искать, поиск
8.accuracy , n ['xkjurqsi]	– точность
9.by and error [bai xnd 'erq]	– методом проб и ошибок
10.ratio , n ['reiSiql]	– соотношение
11.simulate , v ['simjuleit]	– моделировать
12.technical advance ['teknik(q)l qd'vRns]	– технический прогресс
13.challenge , n ['Cxling]	– зд. задача
14.as yet [xz jet]	– пока, все еще
15.matter , n ['mxtq]	– вещество, материя
16.strength , n [streNT]	– сила, прочность
17.withstand (withstood, withstood) , v [wiD'stxnd]	– выдерживать, противостоять
18.property , n ['prOpqti]	– свойство
19.error , n ['erq]	– ошибка
20.strain , n [strein]	– натяжение, нагрузка
21.stress , n [stres]	– давление, напряжение
22.enable , v [i'neible]	– давать возможность (сделать что-либо)
23.reliably , adv [ri'laiqbli]	– надежно
24.ultimately , adv ['Altimitli]	– окончательно
25.huge loads [hjHG lqudz]	– огромные грузы, нагрузки
26.grain , n [grein]	– зерно
27.furnace , n ['fWnis]	– печь
28.powder , n ['paudq]	– порошок
29.sinter , n ['sintq]	– шлак, сплав
30.save , v [seiv]	– беречь, спасать
31.spray , v [sprei]	– распылять
32.fine , adj [fain]	– мелкий

Task I. Read text A “The Basic Problems of Building Materials Industry”.

Building industry including residential, public and industrial construction holds a considerable place in the national economy and is being carried on a large scale. It is the largest industry in the country. The problems of construction have grown into major, political issues in most countries.

The evolution of techniques is conditioned by economic factors – the search for a maximum of stability and durability in building with a minimum of materials, labour, time and at low cost.

Technical progress is now impossible without high-quality building materials. Success in this field depends on the achievements of physics, chemistry, mathematics, and other sciences. Building materials that are used for structural purposes should meet several requirements. In most cases it is important that they should be hard, durable, fire-resistant, ecologically clean and easily fastened together.

Research in the creation of new synthetic materials is being constantly continued. A great economic advantage is already obtained from the use of polymer and plastic materials in a number of structural elements and different components.

Nowadays, many processes of man's activities can be mathematically described and, therefore, technical facilities are used to simulate these processes automatically. Automation makes it possible not only to free man from doing various operations but also to perform these operations with a greater speed and accuracy.

During the 20th century several entirely new class of building materials appeared. These are different kinds of plastics, synthetic rubbers, reinforced concrete and others. Most new materials were discovered by complete accident, some by trial and error. For example, technologists take some metals mixing them together in certain ratios and temperature and observing what comes out. The process of studying a material's behaviour under pressure, at high and low temperature, in and out of magnetic and electric fields and other conditions can take years and decades. But recent advances in computing and mathematical methods make it possible to simulate the properties of building materials. The simulations begin with the advance of quantum mechanics that govern the matter on the atomic and subatomic level. The work that used to take years can now be done much quicker. Thanks to the new achievements in computing technology and design it makes complex calculations much easier. Where the simulations work, they bring a great change to materials development and research. Thanks to the new simulation technology the 21st century will get new materials to solve various construction purposes. Building materials with universal properties are as yet the challenge of the future.

The Great Galileo considered the science of materials strength as one of the basic engineering disciplines. Technologists and designers have to produce building materials capable of withstanding cosmic cold and vacuum, great strains and stresses. To be sure, there were also errors and tragedies when buildings fell in, machines broke down or bridges collapsed .

The problems of strength of materials are hidden in the mysteries of atomic and molecular structure. Another new discipline is being created. Called the mechanics of destruction it'll enable us to design machines, structures and mechanisms that function reliably. Further development of the science of strength will ultimately result in delicate bridges, light airy buildings, small but powerful machines capable of carrying huge loads.

Another achievement of our technologists is the creation of superhard materials. Powder metallurgy helps to obtain such materials. The operational principle of powder metallurgy is well known – an article of necessary size is modelled, in a mould, out of very small metal grain and put into an electrothermic furnace where the grains get sintered together.

There is another method when powder is sprayed onto metal parts. The spraying of powder on articles made of usual steel makes them highly heat – resistant and much stronger. Their reliability and length of service increase. The powder is pressurized, melted and sprayed in a thin layer on different metal parts. Such a coating makes metal corrosion-resistant for a long period.

Mankind was entering an age of high speeds, pressures and standards which could be generated and withstood only with the help of new and universal materials.

Task II. Read the definitions of the following words and word combinations and memorize them:

corrosion – химическое разрушение, разъедание

mechanics – отрасль техники, занимающаяся вопросами применения учения о движении и силах к решению практических задач (строительная механика)

technologist – специалист по технологии производства

Exercises 1. Use the words from the active vocabulary and put them into the gaps.

1. Cement is a fine... . 2. Building materials differ in hardness, ... and fire-resistance. 3. To...the universal properties of the building materials is the ... of the future. 4. Engineers have to avoid ... in design and constructions. 5. New materials ... high pressure and stress. 6. Reinforced concrete offers technical

...over traditional post-and-beam constructions. 7. A great economic advantage is ... from the use of polymer and plastic materials. 8. Automation makes it possible to perform operations with a greater speed and 9. There is another method when powder is ... onto metal parts. 10. ... used instead of bricks in construction is the most cost-effective way to save money spent on building materials.

Exercises 2. Match the words from the columns.

1. achievement	a развитие
2. to create	b разрушение
3. development	c создавать
4. strength	d достижение
5. destruction	j принцип
6. to simulate	e прочность
7. stress	i разрушение
8. research	h исследование
9. collapse	f напряжение
10 principle	g моделировать

Task III. Learn the information about Passive Voice.

We make passive verb forms with the verb **to be** + **past participial**. We use a passive structure when it is not necessary to know who performs an action.

Exercises 3. Study the models and

- 1) put the verbs into the Past and Future Indefinite
- 2) make the sentences interrogative and negative.

Model a) Aggregates are used for various purposes.
 Aggregates were used in the past.
 Aggregates will be used to produce concretes.

Model b) Are aggregates divided into two classes?
 Aggregates are not divided into two classes.
Were aggregates divided into 5 classes?
 Aggregates were not divided into 5 classes.
Will aggregates be divided into 3 classes?
 Aggregates won't be divided into 3 classes.

1. The term “aggregate” is used to describe inert substances, which are mixed with cement to produce concretes.

2. Cements are not used alone but they are always mixed with inert substances
3. Aggregates are graded in size from fine to coarse.
4. Inert substances are called fine if they pass a 3/16 inch mesh.
5. Others are called coarse aggregates.
6. Aggregates are divided into heavy and lightweight.
7. Expanded clay, perlite and ash are used to produce lightweight concretes.
8. Crushed rock, sand and gravel are used to produce dense concretes.
9. Heavy aggregates are used to produce dense concrete.
10. A wide variety of aggregates is used for various purposes.

Exercise 4. Use the Passive instead of the Active Voice.

For example: Builders use concrete practically everywhere.

Concrete is used practically everywhere by builders.

1. The Egyptians did not know cement in old times.
2. They used clay for producing concrete.
3. The Romans and Greeks made concrete of gypsum and lime.
4. For what structure did the Egyptians, Romans and Greeks use concrete?
5. Builders today produce concrete by mixing water, cement and aggregates.
6. We know different kinds of concrete today.
7. Many factors influence the strength of any concrete.
8. Students prepare concrete during their practice.

Task IV. Find the passive verb forms in the text and give special attention to their forms and use.

Exercises 5. Put the verbs in brackets in the correct tense, active or passive.

1. The term “aggregate” ... (use) to describe inert substances, which ... (mix) with cement to produce concrete. 2. Reinforced concrete ... widely (use) in construction since the 19th century throughout, as bearing elements, beams, floors, spans, columns, panels. 3. A great economic advantage ... already (obtain) from the usage of polymer and plastic materials in a number of structural elements and different components. 4. Aggregates ... (divide) into heavy and lightweight. 5. Most new materials ... (discover) by complete accident, some by trial and error. 6. The problems of strength of materials (hide) in the mysteries of atomic and molecular structure. 7. Contacting with water many metals ... (subject) to corrosion. 8. The simulation ... (begin) with rules of quantum mechanics that ... (govern) the matter on the atomic and subatomic level.

Exercises 6. Translate into English.

1. Строительные материалы должны отвечать некоторым требованиям. 2. Строительные материалы должны быть твердые, огнестойкие, долговечные, экологически чистые и легко соединяться вместе. 3. Технический прогресс невозможен без высококачественных строительных материалов. 4. Исследования по созданию синтетических материалов идут широким фронтом. 5. Последние достижения математики, физики, компьютерного моделирования сделали возможным моделирование свойств материалов. 6. Специальное покрытие защищает металл от коррозии. 7. Благодаря совершенствованию технологии моделирования ученые получают новые строительные материалы. 8. Материалы, обладающие универсальными свойствами, задача будущего.

Exercises 7. Answer the following questions:

1. What materials are as yet a challenge of the future?
2. What are the most important properties of building materials?
3. What new building materials have chemists created?
4. What helps eliminate mistakes in design and construction?
5. What new discipline is being created and why is it necessary?
6. Where are the problems of strength of materials hidden?
7. Is simulating a new way of creating materials?
8. What makes it possible to simulate the properties of building materials?

Task V. Speak about the Basic Problems of building materials using expressions.

I'm going to speak about ...

The text is about ...

I'll start by saying that ...

Now just a few words about ...

One of the main problem is ...

We shouldn't forget that ...

In conclusion I'd like to say that ...

The problem of the text is of the great importance ...

To sum it up ...

Text B. The Choice of Material.

Vocabulary

1. **meet requirements** ['mʃt ri 'kwaɪqmɒnts]- отвечать требованиям

2. **take into account** ['teɪk ɪntə 'kaʊnt]- принимать во внимание

3. **advantage**, n [qd'vRntiG] - преимущество
4. **to be subjected on** [tH bJ sqb'Gektid 'on] - подвергаться
5. **reinforced concrete** ["rJin'fLsd 'kOnkrit] - железобетон
6. **prestressed concrete** [pri'srest 'kOnkrit] - напряженный бетон
7. **utilized** ['jHtilaizd] - использованный
8. **brittle**, n ['britl] - хрупкий
9. **load**, n [lqud] - нагрузка
10. **masonry units** ['meisnri junit]- кирпичная кладка, каменная кладка
11. **mortar**, n ['mLtq] - раствор
12. **floor**, n [flL] - перекрытие
13. **spans**, n [spxnz] - пролеты
14. **beam construction** ['bJm kqn'strAkS(q)n]- каркасная конструкция
15. **homogeneous**, adj ["hOmqu'GJnjqs] - однородный
16. **reinforcement**, n ["rJin'fLsment] - арматура
17. **rust**, n [rAst] - коррозия, ржавчина
18. **rubber**, n ['rAbq] - резина, каучук
19. **handle**, n ['hxndl] - ручка
20. **pliers**, n ['plaiqz] - клещи
21. **spanner**, n ['spxnq] - гаечный ключ
22. **lightweight bricks** ['laitweit brik] - легковесные кирпичи
23. **compressive strength** [kqmp'resiv streNT] - прочность на сжатие
24. **plaster** ['plRstq] - штукатурка
25. **capacity of hardening** [kq'pxsiti ov 'hRdniN] - способность к твердению
26. **precast prestressed concrete** [pri'kRst pri'srest 'kOnkrit] - сборный предварительно напряженный бетон
27. **slip**, v [slip]- скользить, проскальзывать
28. **wire mesh** ['waiqmeS] - проволочная сетка
29. **distribution**, n ["distri'bjHS(q)n] - распределение
30. **storage tank** ['stLriG 'txNk]- резервуар, цистерна
31. **method of reinforcement** ['meTqd qv "rJin'fLsmqnt] -метод армирования
32. **gain strength** [gein 'streNT] - наращивать прочность

Task I. Read text B “The Choice of Material”.

There is a great number of building materials now – ancient and new ones. Materials that are used for structural purposes should meet several requirements. They should be hard, durable, fire-resistant. In this choice of materials for

construction, the engineer must take into account many factors – availability, cost, properties and others. Which material can be used to best advantage for a particular part of the building, depends as well on the kind of load to which it is subjected and on the shape of the part. That the development of the metallurgical and machine-building industry made possible mass production of the prefabricated large-size concrete and reinforced-concrete structural elements is a well-known factor to influence the choice of materials. It is advantageous to employ reinforced concrete in such structural elements.

Reinforced concrete is a building material in which the compressive strength of concrete and good elastic properties of steel are effectively utilized; so the resulting material has the advantages of both. Being brittle, concrete cannot withstand tensile stresses, and it can't therefore be used in structures subjected to tensile stresses under loads. But if steel is introduced into concrete it changes the property of material. To introduce steel into concrete the method of reinforcement is generally used. It consists in putting a wire mesh or a system of rods into the concrete in definite proportions. Concrete and steel form such a strong bond – the force that units them – that the steel cannot slip within the concrete. Specialists have to calculate the quantity and the distribution of the reinforcement in concrete mix. Thanks to the continuity of steel reinforcement separate elements of a building become homogeneous and monolithic. All elements act together and a reinforced concrete beam-and-slab system is structurally more efficient than a wooden floor composed of separate joints. Reinforced concrete offers technical advance over traditional post-and-beam construction. Supports are smaller, spans are wider and there is almost no upward limit to height. Besides reinforced concrete walls can also be thinner and it will not need further fireproofing, it withstands a temperature of 2300 F for eight hours.

It has the wearing properties of stone and acts as a heat insulator. Another advantage is that steel does not rust in concrete.

There are two kinds of reinforced concrete: with ordinary reinforcement and concrete with prestressed reinforcement. Reinforced-concrete structures and elements are widely used both for residential house and industrial buildings. Prestressed concrete is traditionally used for beams but now employed extensively for columns, pipes, storage tanks, etc. Prestressed concrete uses less steel and less concrete. Because it is so economical, it is a highly desirable material. It is also widely used in building bridges and arches. It is difficult to imagine modern building without reinforced concrete.

One of the most significant facts about both industry and building has been research on synthetics and plastics. Plastics have appeared comparatively recently, owing to their inherent valuable and diverse properties, have found a wide application in many industrial fields. In respect to physical and mechanical properties at a normal temperature of 20⁰C all plastics are divided into rigid, semi-rigid, soft and plastic. In respect to the number of constituents plastics may be classified as simple and complex. Plastics consisting of one polymer are referred to

as simple. Thus, organic glass (plexiglass) consists of one synthetic resin. But in building field we usually deal with complex plastics. Because many resource materials are available and many different combinations are possible, the plastics family is very large and is constantly growing larger.

In many cases bricks too are very satisfactory for use in the construction. A brick is best described as “a building unit”. It may be made of burnt clay, of concrete, of mortar or of a composition of sawdust and other materials. The shape and convenient size of a brick makes it easy to work. Bricks generally present a pleasing appearance and can be obtained with various qualities, colours and textures. Being of a high volume weight and high thermal conductivity, ordinary brick is not always satisfactory in building practice. There are other kinds of bricks which are more effective, they are light-weight building bricks, hollow or porous bricks. Light-weight building bricks differ from ordinary clay bricks in a lower volume weight and lower thermal conductivity, and are therefore more economical than ordinary bricks.

Rubber is an elastic substance which is made naturally or artificially. In the beginning of the 20th, the technologists started an extended research into the chemistry of synthetic rubber. In fact, the synthetic product is not rubber at all. It is an assembly of molecules derived from such products as coal, petroleum and limestone. Synthetic rubbers are better for many purposes than the natural products. Chemists know at least 3000 formulas for making rubber-like substances. A further step in rubber technology was the combining of rubber with metals, wood and asbestos so as to obtain a product having the elasticity of rubber and the strength or special properties of the other components. This phase of research greatly increased the potential uses of rubber. Synthetic rubber is widely used in construction and road building. It is used for coatings: roofs (ruberoïd), walls, floors and tubes, wires, for handles of engineering tools: hammer, pliers, screwdriver, spanner, etc.

Lime, gypsum and cement are the three materials most widely used in building construction for the purpose of binding together masonry units, such as stone, brick and as constituents of wall plaster. Cement is furthermore the most important component of concrete.

The most important building materials may now be considered to be structural steel and concrete. Concrete is an artificial conglomerate of crushed stone, gravel or similar inert material with a mortar. There are three stages in producing concrete: mixing, setting and hardening a mixture of sand, screenings or similar inert particles with cement and water which has the capacity of hardening into a rocklike mass is called mortar. The fundamental object in proportioning concrete or mortar mixes is the production of a durable material of required strength, watertightness and other essential properties at minimum cost. To obtain this effect careful attention must be given to the selection of cement, aggregate, and water.

Construction is growing from year to year in our great country. This requires the use of new building methods and new building materials which play a very important role in the work of architects and builders. They help to develop modern architecture, speed up construction work and decrease its cost.

Exercise 1. Choose the correct word from the two words given in brackets.

1. The material doesn't ... high temperature (stand, withstand).
2. When a series of beams and columns are rigidly ... (connected, continued) together they form a frame which distributes the loads and stresses of one part to all the others.
3. The idea of applying steel and concrete together is to use ... of concrete and ... of steel (high compressive strength, good elastic properties).
4. Building mortars are classified according to their applications and kind of ... (building, binding) materials, which is used to produce them.
5. Another advantage of reinforced concrete is that steel does not ... (rust, expand, contract) in concrete.
6. Reinforced concrete acts as a heat ... (insulator, conductor).

Exercise 2. Match the words and their definitions.

- | | |
|----------------------------|---|
| 1. method of reinforcement | a) it is a mixture of water, cement, aggregates (usually gravel, sand, crushed stone) |
| 2. concrete | b) unified whole |
| 3. building mortars | c) it is a mixture of binding material (lime, gypsum, cement) fine aggregates and water |
| 4. advantage | d) prepared right at the building site |
| 5. homogeneous (element) | e) preferable properties of material |
| 6. precast concrete | f) putting a wire mesh into the concrete |
| 7. monolithic (in-situ) | g) prepared at a factory |

Task II. Find the comparative and superlative degrees of the adjectives in the text and give special attention to their forms and using. Learn the information about the formation of degrees of adjectives.

You add *-er* for the comparative and *-est* for the superlative of one syllable adjectives.

Example: cheap – cheaper – the cheapest.

You add *more* for the comparative and *most* for the superlative of two syllable adjectives, and longer.

Example: beautiful – more beautiful – the most beautiful.

A few common adjectives have irregular comparative and superlative forms.

Example: good – better – the best

bad – worse – the worst

far – farther/further – the farthest/furthest

little – less – the least

Exercise 3. Give the comparative and superlative degrees of adjectives.

1. In comparison with steel timber is ... (light, cheap, easy) to work. 2. ... (more, the most) important building materials may now be considered to be structural steel and concrete. 3. There are other kinds of bricks which are (more, the most) effective than common ones. 4. Synthetic rubbers are ... (good) for many purposes than the natural products. 5. Supports are ... (small), spans are ... (wide) and there is almost no upward limit to height. 6. Reinforced concrete is a combination of two ... (strong) structural materials concrete and steel. 7. The ... (new) building materials created nowadays comprise film products, alloys plastics, glues and others. 8. Besides, reinforced concrete walls can also be ... (thin). 9. The ... (more, most) important mortars for industrial building are those, which gain necessary strength in short time. 10. Prestressed concrete uses ... (little) steel and ... (little) concrete.

Exercise 4. Translate sentences, paying special attention to modal verbs and their equivalents.

a)

1. We must use new methods in our research work.
2. Due to the energy of the atom man can produce electric energy at atomic power stations.
3. Mortars may be applied for jointing panels, for brickwork or for plastering.
4. They ought to help their friend to solve this important problem.
5. She could not complete her research in time as she worked very slowly.
6. You should turn off the light before you leave the room.

b)

1. The atom is to serve mankind.
2. He had to work hard before he was able to complete his research.
3. Nobody was able to understand this mysterious phenomenon.
4. Are students allowed to use this device for calculations?
5. The students were unable (were not able) to the work without their teacher's help. He had to help them.

Exercise 5. Put the modal verbs into the Past and Future Indefinite.

1. Every engineer must know at least one foreign language.
2. Who can prepare cement mortars?
2. Are students allowed to use this device for calculations.
3. You may use this instrument in your experiments.
4. They can't understand the essence of this phenomenon.

Exercise 6. Put the sentences in negative and interrogative forms. Translate them.

1. We must use the new tools to cut and form this metal parts.
2. This equipment can produce parts with very high accuracy.
3. They could easily define the properties of this material.
4. He may complete all necessary measurements himself.
5. With the help of a new device the scientists design new building materials.

Exercise 7. Choose the correct modal verbs and their equivalents.

1. If you want to know English you ... to work hard (may, can, have to).
2. He ... go to the Far East on business (to be, may, can).
3. He ... to use the mobile equipment (to be allowed, to be able, ought to, to be).
4. We ... walk home because the last bus had gone (had to, might, could).
5. She ... translate this text without a dictionary (can't, mustn't, may not).
6. ... I take this book? (Can, May, Must) – No, youI need it myself.

Exercise 8. True or false?

1. Natural rubbers are better for many purposes than synthetic products.
2. Both materials steel and concrete are very strong and are widely used in building separately.
3. Brick was the first artificial building material made by man of clay and sand.
4. Air, water, sand, salt, coal, petroleum are familiar elements in the everyday life, but they form the basic sources of the world's fastest growing industry – plastic.
5. Another advantage of reinforced concrete is that steel does not rust in concrete.

Task III. Using the information of the text, characterize:

- the problem of the choice of material
- the main properties and advantages of reinforced concrete.

Exercise 9. Put the missing words into the gaps, using the words under the line.

1. Materials that are used for structural purposes should They should be hard 2. Reinforced concrete is a building material in which the ... of concrete and good ... of steel are effectively 3. In building field we usually ... complex plastics. 4. Bricks generally ... a pleasing appearance and can be ... with various qualities, colours and textures. 5. Building mortars are classified according to the applications and kind of ... material, which is used to produce them. 6. There are three stage in producing concrete: ..., settings, 7. A further step in rubber technology was the ... of rubber with metals, wood and asbestos, so as to ... a product having the elasticity of rubber and the strength or special properties of the other components.

meet requirements; the compressive strength, good elastic properties, combined; durable, fire-resistant, acid-resistant; present, obtained; mixing, hardening; deal with; binding; combining, obtain.

Task IV. Speak about the most important and widely used building materials using the key words and word combinations.

1. method of reinforcement
2. concrete with prestressed reinforcement
3. extended research
4. essential properties
5. for the purpose of binding together

Text C. Classification of Building Materials.

Vocabulary

1. enormous, adj [i'nLmq̃s]	огромный
2. output, n ['autput]	выпуск
3. cost price [kOst prais]	себестоимость
4. bearing, a ['bFqriN]	несущий
5. plane, n [plein]	плоскость
6. auxiliary, a [Lg'ziljqri]	вспомогательный
7. precast prestressed concrete [pri'kRst pri'sres 'kOnkrit] –	сборный предварительно напряженный бетон
8. permeability ["pWmj̃q'biliti]	проницаемость
9. liquid, n ['likwid]	жидкость
10. evaluate, v [i'vxljueit]	оценивать
11. ability, n [q'biliti]	способность
12. impact, n ['imp̃xkt]	удар

1. Great possibilities are open to our architects and builders by using modern building materials, achievements in science and technology in building.

2. As to the application all building materials are divided into three groups:
 - a) main building materials such as rocks and artificial stones, timber and metals, which are used for bearing structures.
 - b) binding materials such as lime, gypsum and cements, which are used for jointing different planes.
 - c) secondary or auxiliary materials which are used for interior parts of the buildings, such as: tiling, synthetic linoleum, coatings and other facing materials.

3. If the materials do not require any technological changes in their chemical structure they are called natural building materials. These are: stone, clay, sand, lime, timber. Many of these materials have been known from time immemorial. Thus, the ancient Pyramids were constructed of stone. Stones are strong, durable, weatherproof and some of them are so attractive that the walls constructed of them don't need any special finish. Cement, concrete, reinforced concrete, plastics and others are examples of artificial building materials. The great discoveries of our time in physics, chemistry, and other sciences make it possible to create new building materials.

4. The properties of building materials are generally classified as physical, chemical and mechanical. Physical properties of materials include their characteristics relating to weight and density, their permeability to liquids, gases, heat and their resistance to aggressive environmental conditions. Chemical properties of materials are essentially evaluated by their resistance to acids, alkalis and salt solutions. The ability of materials to resist compression, tension, impact, penetration by a foreign body and other actions involving force, are generally known as mechanical properties.

5. Along with traditional building materials new ones have been created such as reinforced concrete, lightweight concrete, precast and prestressed concrete,

etc. The newest building materials created nowadays comprise film products, alloys, plastics, glues and others.

6. As to their qualities, building materials should be durable, strong, water resistant, acid-resistant heat resistant, etc. Some of them should also have a pleasant appearance. Materials with universal properties are as yet a challenge f the future.

Exercise 1. Find the English equivalents for the following word combinations in the text.

Огромные возможности, текущая задача, специальные капиталовложения, искусственный камень, вспомогательные материалы, различные плоскости, универсальные свойства, внутренние части, химическая структура, технологические изменения, облицовочные материалы, синтетический линолеум, приятный внешний вид, устойчивость к кислотным воздействиям, сопротивляться удару, инородное тело, легковесный бетон, сплавы, предварительно напряженный бетон.

Exercise 2. Scan the text and write the number of the paragraph that deals with the following topics.

- a) the application of building materials
- b) the properties of building materials
- c) the importance of building materials industry
- d) the qualities of building materials
- e) the traditional and the newest building materials
- f) natural and artificial building materials

Exercise 3. Scan the text to find the information on the following aspects.

- classification of building materials according to their application
- the main properties of building materials
- the main qualities of building materials

Exercise 4. Match the sentence beginning (1-5) with the correct ending (a-e):

1.The main current tasks are ...	a) natural building materials.
2.Technical progress is now impossible without ...	b) To speed up the development of the building materials industry, to decrease the cost price of its manufacture.

<p>3.If the materials do not require any technological changes in their chemical structure they are called ...</p> <p>4.The newest building materials created nowadays comprise ...</p> <p>5.As to the qualities, building materials should be ...</p>	<p>c) high-quality materials.</p> <p>d) durable, strong, water-resistant, acid-resistant, etc.</p> <p>e) film products, alloys, plastics, glues and others.</p>
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Exercise 5. Write down the key sentence from each paragraph.

Example: 1. The main current tasks are to speed up the development of the building materials industry and to decrease the cost price of manufacture and the special capital investments.

- 2.
- 3.
- 4.
- 5.
- 6.

Exercise 6. Do you agree or disagree with the following opinion? Write an essay of 100-200 words to support your opinion.

Use given expressions to help you:

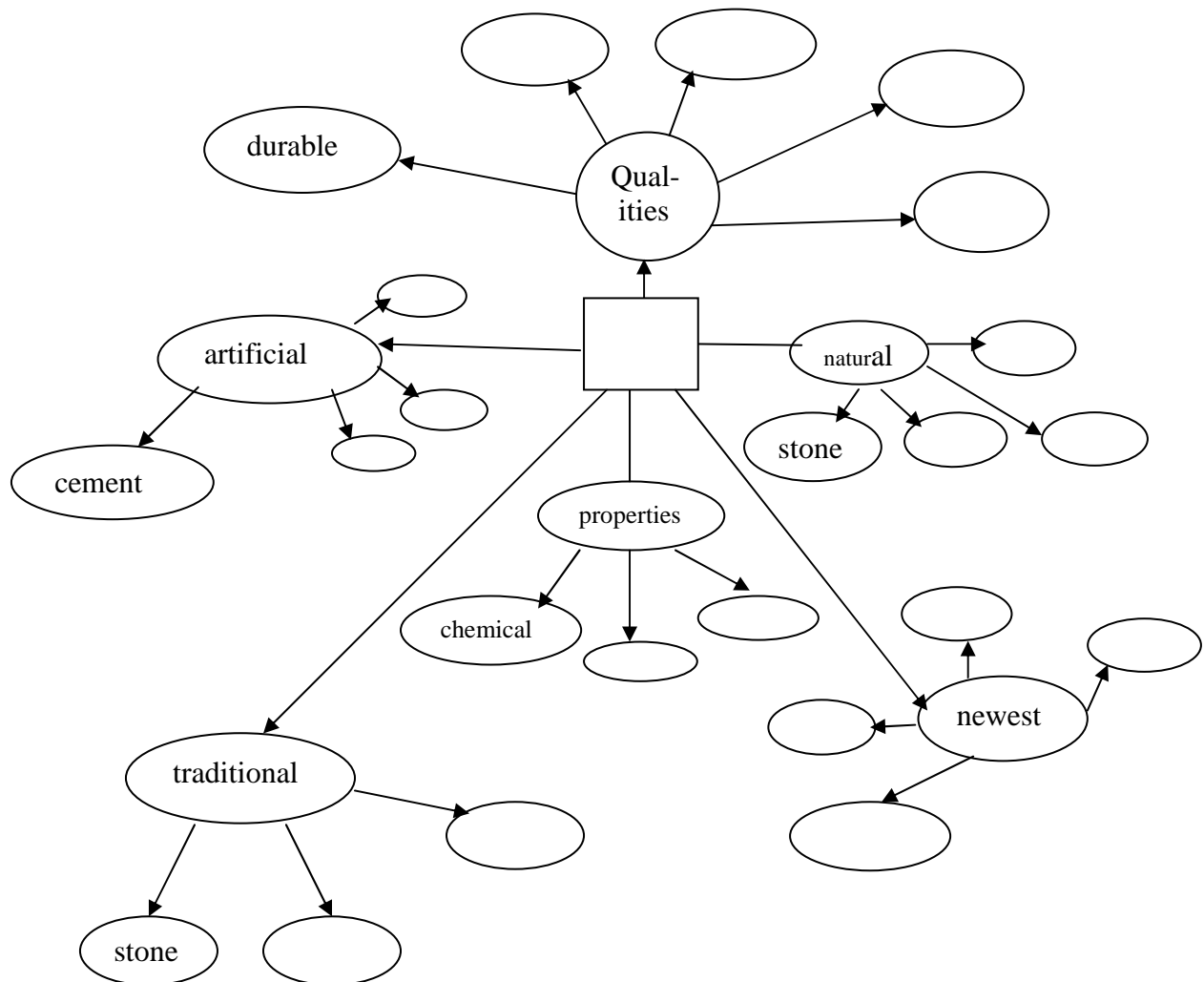
in my opinion, as far as I know, if I'm not mistaken, as far as I remember, it should be noted.

-materials with universal properties are as yet a challenge of the future.

Task II. Write your own variant of the summary of the text.

For example: In my opinion technical progress is now impossible without high-quality building materials. It should be noted that engineers-technologists must select, adapt and create such materials that will give the most effective result by the most economical means.

Task III. Build up the scheme:



Texts for self-study and analysis

Building materials

How materials influence the schools of architecture.

Since the beginning of civilization man has always been a builder. A building reflects the society of its time more than any other art-form. It is interesting to note briefly the influence of materials upon the schools of architecture. Where clay abounded, as Egypt, sun-dried bricks were easily and cheaply made. Stone was also obtainable, and because of its durability it became the material of the temples and palaces; the less pretentious dwellings were built of brick. In Mesopotamia large brick buildings were constructed, and, in the absence of stone and wood to span their areas, the arch and dome came into being. Greece possessed perfect marble for columns and beams, and the arch and dome received little attention. A fortunate combination of lime, limestone, clay and pozzuolana gave Rome stone and cement, and the great variety of its structures is largely due to the union of stone, brick, strong mortar, and concrete. In Northern Europe, Switzerland, and Russia, where forest abounded and other materials were difficult to obtain, wooden architecture was favoured for buildings of all types.

During the Roman Empire round arches, vaults and domes were perfected, as never before, in stone, brick, and concrete, this development being made possible by the abundance in Italy of good limestone and pozzuolana, a volcanic material, which when mixed with lime produced an excellent cement.

Most of the world's great architecture is in stone, because until recently this was the material used in practically all the buildings where monumentality and permanence were desired. Thus the stone tradition has permeated much of our architectural thinking and has determined much of our taste and judgment.

In conclusion it is necessary to say that in building structures special attention must be paid to the proper use of materials. Science, machinery, and easy transportation are now bringing to the hands of architects resources of materials hitherto unknown or unobtainable.

Concrete

Concrete is an artificial stone. It is made by mixing cement and water with sand and crushed stone, gravel or other inert materials – aggregates. Then this mixture is

placed in forms, a certain chemical action takes place between the constituents and the mass hardens.

Concrete is not a modern building material. It was used by the Egyptians, Romans and Greeks in the construction of bridges, roads and many of their buildings were constructed of concrete. As cement was not known in those times, concrete was made of clay. Plain or mass concrete can be used for almost all buildings purposes. At present concrete is made by mixing water, cement and aggregates usually sand, gravel and crushed stone.

There are three stages in producing concrete: mixing, setting and hardening. The resulting material is strong, durable, hard, heavyweight or lightweight, acid-, air-, water-, gas-, heat-, and corrosion resistant.

There are different kinds of concrete: dense, lightweight, super-heavy, extra-lightweight, cellular. The kind of concrete depends on the aggregates used.

There are different methods in producing concrete. It may be prepared right at the building site and is called monolithic or in-situ concrete. It may be prepared at a factory and is called precast. The strength of any concrete is influenced by the following factors:

- 1) the activity of cement,
- 2) the water–cement ratio,
- 3) the quality of aggregates,
- 4) the hardening condition.

Concretes are classified according to the following main characteristics: bulk density, type of building material, strength, frost resistance, and application.

By their bulk density concretes are divided into super heavy concretes, heavy concretes, lightweight concretes. According to the kind of binding material, concretes are available in the following varieties: cement concretes, lime-sand concretes, gypsum concretes and concretes from organic binding materials.

Strength and durability are major characteristics of the quality of concretes. Durability of concretes is evaluated in terms of their frost resistance. By compressive strength concretes fall into a number of grades: heavy concretes, lightweight and extra-heavy ones. Heavy concretes is manufactured from cement and common dense aggregates, and lightweight concrete, from cement and natural or artificial porous aggregates. A variety of lightweight concrete is cellular concrete which is a hardened mixture of a binding materials, water, fine silicate component and pore-forming agent. It is distinguished by a high (up to 90 per cent) with uniformly distributed pores, up to 3 mm in size.

Lime-sand concretes are obtained by mixing lime and quartz sand and subsequently hardening mould items in autoclaves at pressures between 8 and 12 atm. and temperature from 170 to 200 C.

By application, concretes are divided into the following kinds: 1) common concretes are used for concrete and reinforced concrete supporting elements of buildings and installations (columns, beams, slabs, panels). 2) hydraulic engineering concretes (for dams, facing of channels). 3) concretes for walls of buildings and light floors, 4) asphalt concretes (for road surfaces and bases), 5)

concretes for special purposes, such as acid – and heat-resistant super heavy concretes.

Concrete is one of the structural building materials which led to great innovations.

Plastics in building

One of the most significant facts about both industry and building has been research on synthetics and plastics. Plastics are substances, natural or artificial, which can be moulded into any desired shape by application of heat and pressure. Plastics have appeared comparatively recently but, owing to their inherent valuable and diverse properties, have found a wide application in many industrial fields. Application of plastics in building fields widens from year to year.

The word plastics is a general name for a group of materials meaning “capable of being moulded”. They retain the plastic properties at definite stages of their production and contain synthetic resin, forming high molecular substances. The plastic industry dates perhaps from 1870 with the initial production of celluloid. Except for celluloid, made from chemically modified cotton, wood and other materials, plastics are produced by synthesis from such natural resources as water, air, coal, salt, petroleum and natural gas.

Now there are hundreds of different plastics, each with its own particular properties. Some plastics are hard, rigid and quite impenetrable by light, even they are very thin. Others are flexible as celluloid even more transparent and yet extremely hard. By alloying, modifying and changing the structure of polymers technologists produce different kinds of plastics. There are two basic groups of plastics: “thermosetting” and “thermoplastics” distinguished by their behaviour when heated. In respect to physical and mechanical properties at normal temperature of 20 C all plastics are divided into rigid, and semi-rigid. In respect to the number of constituents plastics may be classified as simple and complex. Plastics consisting of one polymer are referred to as simple. Thus, organic glass (Plexiglas) consists of one synthetic resin. But in building field we usually deal with complex plastics, e.g. plastics consisting of a polymer and other components.

Today plastics are of great importance because they offer a unique combination of properties valuable for construction. They are: small unit weight, great mechanical strength, durability, good insulating properties, variety of colors, resistances to corrosion and chemicals. Plastics have a pleasant appearance. Some of them are transparent and easy to glue. Some may form thin protective films.

Plastics may be easily formed into different articles of given size and shape. Their ability to soften makes it possible to mould them, to press and to stamp. All these ways of production lead to high precision of sizes and correct shape of details produced.

Plastics can be reinforced by fibrous materials such as glass fiber and nylon. Plastics are suitable for many purposes. In some cases they replace metal and glass.

Plastics have a wide application in construction as films, resins, tiles, tubes for cold water. Pipes may be available in colours stable to exposure; therefore they

will not be subjected to corrosion. The lightness and toughness of such pipes offer definite advantages in transportation and fixing.

Because many resource materials are available and many different combinations are possible, the plastics family is very large and is constantly growing larger. The raw materials of the industry are numerous and varied, and the development goes on all the time in finding new and better uses.

Plastics give people the opportunity to create warmth, colour and variety. A great future is open for plastics.

Metals

Man has used metals for centuries in gradually increasing quantities.

Today we know more than sixty-five metals the majority of which are available in larger enough quantities to be used in industry.

All metals are divided into ferrous metals and non-ferrous metals. Ferrous metals include iron, steel and its alloys. Nonferrous metals are metals and alloys, the main component of which is not iron but some other element.

Metals, in general, and especially ferrous metals are of good importance in variations. Metals possess the following properties: 1) All metals have specific metallic lustre. 2) They can be forged. 3) They can be pulled. 4) All metals, except mercury, are hard substances. 5) They can be melted. 6) In general, metals are good conductors of electricity.

These characteristics are possessed by all metals but the metals themselves differ from one another. Still and cast iron are referred to the group of ferrous metals. Cast iron is the cheapest of the ferrous metals. It is chiefly used in building for compressed members of construction, as the supporting members.

Steel. There are different kinds of steel. Alloyed steel (or special steel) is corrosion-resistant steel. It is used for cutlery, furnace parts, chemical plant equipment, valves, ball-bearings, etc. The availability of steel and concrete has made possible the most characteristic kind of modern structure: the steel or concrete frame building. Not only towering modern skyscrapers, but also many less gigantic and spectacular buildings have a skeleton of steel and concrete that bears the weight of the structure.

Non-Ferrous Metals. Non-Ferrous metals have the following characteristics: high electric and heat conductivity, high corrosion resistance, non-magnetic qualities, light weight.

Copper. Copper is the best conductor of electricity. There are different alloys with copper. An alloy of copper and tin is called bronze.

Aluminium. Aluminium is one of the most remarkable materials of today. It weighs much less than steel but has many the same properties. Aluminium beams have already been used for bridge construction and for the framework of a few buildings. Aluminium can be rolled into sheets, or drawn into wire. It is an excellent conductor of electricity and heat, it resists the corrosion of many acids, and can form a wide variety of alloys with other metals. Aluminium is non-

magnetic, which makes it preferable to steel for certain parts of electrical machinery.

Special aluminium paint reduces absorption of heat from the sun. Lightweight metals show the way to greater speed in transport. This is why aluminium is being extensively used in the new stream-lined trains. Scientists believe that in due course aluminium will become more important than iron.

Timber

Timber is one of the most important natural building materials. It is self-renewing and trees have always exerted significant effects on people and the environments. In comparison with metal timber is lighter, cheaper and easier to work. Timber has many valuable properties for construction. Its positive properties are: 1) strength in combination with low volume weight, 2) poor thermal conductivity, 3) the easiness of treatment, 4) the simplicity of jointing, 5) high frost resistance.

There are many types of timber available for use in buildings that architects will find some difficulty in choosing the best for any particular purpose. This is especially the case with the woods used for joinery and for the more decorative parts of a building. Possibly the best advice is to acquire a good knowledge of the timbers in most general use for structural purposes.

A usual broad classification is into softwoods and hardwoods. Softwoods are used for most structural work and for painted joinery. Hardwoods are usually employed for more decorative purposes and for places such as floors where resistance to abrasion is required, or where the pattern of the timber is to be exposed by polishing. It's also necessary to point out that there are some quite important exceptions to the general rule that "hardwoods" are hard and "softwoods" are soft. The division is, in fact, a botanical one, the hardwoods being broad-leaved species and the softwoods conifers.

A tree grows by the addition of layer upon layer of materials; usually one of fresh is added every year to the outside of the tree, though in the tropics growth is more or less continuous and layers are not necessarily added at annual intervals. In the center of the tree is the heart, and on the outside is the bark with a certain thickness of sapwood immediately beneath. Where branches occur there will be knots. The general structure is cellular and the arrangements of the cells varies in different types. Each of these features - cell structure, knots and annual rings will vary not only from the type of tree to another, but also within each type, because of the variable conditions under which the trees grow. A tree growing rapidly in a warm climate will produce a different grade of wood to that from a similar type of the tree growing under colder conditions and a forest tree will differ from an isolated one. All this times that wood is an extremely variable material and if it is to be used to the best advantage it must be carefully selected; or it must be used as a basis for a manufactured product which by reason of its manufacture overcomes this variability. Production of plywood is a good example of a manufacturing process which eliminates much of the variability of ordinary timber.

Shelter in the United States

The early Indians of North America lived in a number of different types of shelter. In the Northeast, round houses or rectangular longhouses were built from bent poles covered with deerskin. The Penobscot Indians erected wigwams covered with birch bark. The Iroquois built large longhouses covered with bark shingles.

Most Indians of the Great Plains lived in portable, cone-shaped tepees made from poles covered with animal hides. In the Southwest, certain tribes built pueblos from adobe and stone. In the Far North, Eskimos used three types of dwellings—tents of skin in the summer, huts of stone, turf, bones, and dirt in the winter, and snow igloos for the temporary shelter of winter hunting parties.

The English colonists who first landed in New England had to build shelters quickly to allow enough time for planting. They probably lived in rough houses of wattle and daub. Later, they may have built half-timber houses like those they left behind in England. For protection from the cold New England winters, the settlers soon covered their homes with wooden planks called clapboards to provide extra insulation. Huge fireplaces using a single chimney were important parts of the house.

In the South, the English colonists used brick as well as wood for their houses. Some homes had porches two stories high. Huge chimneys were common. In California and the Southwest, many Spanish colonists lived, like the Indians, in adobe houses. The early French settlers in New Orleans built half-timber houses. Later, the homes of the French in New Orleans had plaster walls painted in pastel colors, delicate wrought-iron balconies, and courtyards in the rear.

A most important type of early American shelter was the log cabin. German and Swedish colonists introduced it. When the pioneers pressed westward, they built log cabins. But in the treeless Great Plains, they built houses of sod bricks cut from the prairie.

Power-driven machinery came into use in the United States in the first half of the 19th century. Sawmills, using steam power, provided abundant lumber. Nails and other metal products became cheap and plentiful. Steamships, canals, and finally railroads made these materials available in all settled communities at a relatively low cost.

Inventors and manufacturers introduced many household conveniences. By the 1850s, fireplaces were being replaced by coal-burning stoves. Later in the

century, central heating by furnaces and radiators was used. Homes today enjoy modern plumbing and use gas or electricity for cooking and lighting.

Modern homes have a number of rooms, each of which may be designed to serve a particular purpose. This purpose is indicated by the name—the kitchen, dining room, bedroom, bathroom, and, in larger homes, the utility room, family room or recreation room (once called the rumpus room), the den, and the study or library. But many rooms now combine several purposes. Modern kitchens or bathrooms may contain laundry equipment. In many new homes, the living room and dining room have been combined.

Some city apartments may have as many rooms as a house. Others may be small efficiency apartments where space is conserved by the use of a kitchenette and of sliding wall panels that give access to a bed and storage. Loft apartments may consist of one enormous room with a few freestanding walls. Apartments may have radiant heating, indirect lighting, central air-conditioning, and built-in laborsaving appliances like garbage-disposal units and dishwashers.

Shelter has come to mean more than just “a roof over one's head.” Today a dwelling that is dilapidated or lacks indoor plumbing or has more than one person per room is considered inadequate shelter.

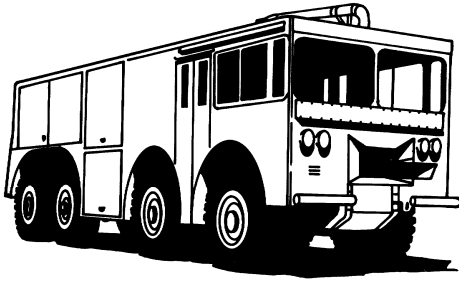
But many low-income people can afford shelter only in old and nearly worn-out buildings in which the indoor plumbing is broken and space is limited. They are trapped in decaying neighbourhoods that have degenerated into slums.

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UNIT III

Mechanical Engineering

Speciality:

Mechanical Engineering

Grammar:

Noun. Plural form. Numerals. Degrees of Comparison of Adjectives. The Simple Tenses. The Emphatic Construction. The Passive and Active Voices. The Present Perfect and Future Perfect Tenses in the Active and Passive Voices. Attributive Clauses, The Gerund.

What Do Mechanic Engineers Do?

At present different branches of the national economy are in great need of mechanic engineers. They are claimed in the organizations performing construction of civil and industrial buildings, transport arteries and structures, in the production of building materials and products and at the enterprises of machine-building complex and at research and design institutes.

The objects of their professional activities are great: transport and technological complexes of different destination; load-handling equipment; earthmoving vehicles; machines for maintenance and repair of roads; machines and equipment for making bases and foundations; technological machines for producing building materials and products, and many others.

Nowadays the main task of mechanic engineers is to design new, reliable and highly efficient machines consuming less power and increasing labour productivity at low cost.

Text A. "From the History of Automobile Industry in Russia".

Vocabulary

1. **produce** [prɔːdʒɪs], v - производить
2. **machine-building works** [mɔːʃɪnˈbɪldɪŋˈwɜːks] - машиностроительный завод
3. **score** [skɔː], n - два десятка, множество
4. **outbreak** [ˈaʊtbreɪk], n - начало
5. **vehicle** [ˈvɪkəl], n - транспортное средство
6. **exceed** [ɪkˈsiːd], v - превышать
7. **unit** [ˈjuːnɪt], n - единица, элемент
8. **mostly** [ˈmɒstli], adv - главным образом
9. **effort** [ˈefɔːt], n - усилие, попытка
10. **get down** [ˈgetˈdaʊn], v - сойти, спуститься
11. **commercial** [kəˈmɜːʃl], a - промышленный, торговый
12. **develop** [dɪˈveləp], v - развиваться
13. **assembly line** [əˈsembliˈlaɪn] - сборочный конвейер
14. **appear** [əˈpiːə], v - появляться
15. **manufacture** [ˌmænʃuːˈfæktʃə], v - производить
16. **undergo** (underwent, undergone) [ˈʌndəɡəʊ] - испытывать, подвергаться
17. **turn out** [ˈtɜːnˈaʊt], v - выпускать
18. **to meet requirements** [ˈmiːt riˈkwaɪəmənts] - отвечать требованиям
19. **national economy** [ˈnæʃnəl iˈkɒnəmi] - народное хозяйство
20. **workshop** [ˈwɜːkʃɒp], n - цех
21. **surpass** [səˈpɑːs], v - превосходить
22. **reach** [riːtʃ], v - достигать
23. **deliver** [dɪˈlɪvə], v - производить, доставлять
24. **mechanical engineering** [miˈkænɪkl, enɡɪˈnɪəriŋ] - машиностроение
25. **advancement** [ədˈvɑːnsmənt], n - успех, прогресс
26. **branch** [brɑːnʃ], n - отрасль
27. **light industry** [ˈlaɪt ˈɪndʌstri] - легкая промышленность
28. **timber** [ˈtɪmbə], n - лесоматериалы
29. **as compared to** [əz kəmˈpeəd tə] - по сравнению с ...

Task I. Read text A: "From the History of Automobile Industry in Russia".

3.1 Text A: "From the History of Automobile Industry in Russia".

Before World War I only a few automobiles were produced in Russia at Machine-Building Works in Moscow, Petersburg, Riga, and Oryol. Most of them

were produced in Riga at the Russian-Baltic Railway Works. During six years (1910-1915) only 451 cars and a score of trucks were delivered.

At the outbreak of World War I the number of vehicles in Russia did not exceed 10,000 units, mostly of foreign production, among them 2,000 trucks.

In 1916 efforts were made to build some Motor Works in Russia, but none of them ever got down to commercial production.

It was only after 1917 that the automotive industry began developing in our country. In 1924 the first trucks came off the assembly lines and took part in the holiday parade on the Red Square in Moscow.

Very few vehicles were produced at that time (1924-1930) at three plants in Moscow - at the I.A.Likhachev Motor Works, at the Yaroslavl Motor Works and at the Moscow Motor Works "Spartak".

In 1932 in Nizhni Novgorod a new Motor Works appeared which planned to manufacture at least 150,000 vehicles a year. The Moscow Automobile Works underwent reconstruction to turn out up 25,000 automobiles.

Five years later at the Nizhni Novgorod, Moscow and Yaroslavl Works trucks, buses and special service cars of all types came off the assembly lines. The highly developed automotive industry was able to meet the requirements of the national economy.

World War II held back the development of automotive industry in our country. The Moscow Motor Works was evacuated to the East. Later on, new Automobile Works appeared on the basis of its workshops in Ylyanovsk, Miass, Shadrinsk, and Chelyabinsk.

After the Great Patriotic War the pre-war level of automotive industry was not only reached but even surpassed in 1949 (276,000 vehicles). During the three Five-Year-Plan periods (1951-1965) the production of cars doubled, and in 1965 it reached the level of 616,000 units.

Until 1965 mainly trucks were manufactured. They made up 62% of the total production of vehicles in our country, as compared to 20% in the USA, Germany, England, France and Italy. In 1968 our country held the third place in the world and the first place in Europe in the production of trucks.

Now many new types of different machines are being produced. They have a higher capacity, a higher engine power and a longer life. Machines take care of all the basic production processes in all the branches of the national economy. They are called upon to facilitate the work of man.

The technical level of light, food, timber and building industries, transport and agriculture depends mainly upon the advancements in mechanical engineering.

Exercise 1. Read the following numbers and numerals:

Example: 1924 – nineteen twenty four; 160,000 – one hundred and sixty thousand.

1910; 1915; 451 cars; 10,000 units; 1916; 1917; 1924; 1930; 150,000 vehicles; 1932; 1949; 276,000 vehicles; 1965; 62 per cent; 20 per cent; 1951.

Exercise 2. Write the following nouns in plural.

Example: an engineer – engineers

an artery – arteries

a process – processes

a machine – machines

a branch, economy, a structure, research, a design, a vehicle, institute, industry, an automobile, capacity, a workshop.

Exercise 3. Put the following sentences in Plural and translate them.

Example: This engineer is working at the design of a new car.

These engineers are working at the design of new cars.

1. The task of this engineer is very important.
2. The main task of an engineer is to design new and highly efficient machines.
3. This machine is used in road construction.
4. This plant is producing a new, reliable machine.
5. An effort was made to build some motor works in Russia.
6. A design of a new vehicle will be proposed in the future.
7. This type of machine has a higher capacity and a longer life.
8. This machine is called upon to facilitate the work of man.

Exercise 4. Read the following proper names:

Moscow, Petersburg, Riga, Oryol, Russia, I.A.Likhachev Motor Works, Yaroslavl, Nizhni-Novgorod, Ulyanovsk, Miass, Shadrinsk, Chelyabinsk, the USA, Germany, England, France, Italy, Europe.

Exercise 5. Translate into Russian paying attention to the Emphatic Construction. First learn the information about it.

Когда надо выделить какой-то член предложения (подлежащее, дополнение, обстоятельство), его ставят в начале предложения между *it is (was)* и *that (who, whom)*. Это – the Emphatic Construction (эмфатический оборот). На русский язык его следует переводить со слова “именно”. Иногда усиление может выражаться при помощи слов “это, только, лишь”.

Например: I met his sister in the park yesterday.

1. **It was I that (who)** met his sister in the park yesterday.
Именно (это) я вчера встретил его сестру в парке.

2. **It was** his sister **that (whom)** I met in the park yesterday.

Именно (это) его сестру я вчера встретил в парке.

3. **It was** in the park **that** I met his sister yesterday.

Именно (это) в парке я встретил его сестру вчера.

1. It was only after 1917 that automobile industry began developing in our country.
2. It was the Moscow Automobile Works that underwent reconstruction to turn out up 25,000 automobiles.
3. It was Shamshurenkov that (who) invented the first vehicle.
4. It was only after the Great Patriotic War that the pre-war level of automotive industry was reached in our country.
5. It was World War II that held back the development of automotive industry in our country.
6. It was until 1965 that trucks were manufactured in Russia.
7. It was in 1968 that our country held the third place in the world in the production of trucks.
8. It is now that many new types of machines are being produced in Russia.
9. It was during the three Five-Year Plan periods that the production of cars doubled in our country.
10. It is machines that take care of all the basic production processes in every branch of the national economy.

Exercise 6. Use the Emphatic Construction in the following sentence:

In 1924 the first trucks came off the assembly lines of the Moscow Motor Works.

Exercise 7. Fill in the missing words given in the right column.

- | | |
|---|---------------|
| 1. A score of trucks were ... during six years. | efforts |
| 2. Vehicles in Russia were ... of foreign production. | delivered |
| 3. In 1916 ... were made to build some Motor Works. | assembly |
| 4. Five years later many different vehicles came off the ... lines. | mostly |
| 5. Modern automotive industry is able to meet the... of the national economy. | requirements |
| 6. Trucks ... 62% of the total production of vehicles in our country. | to facilitate |
| 7. The Moscow Automobile Works ... reconstruction to turn out more automobiles. | longer |
| 8. Machines are called upon ... the work of man. | underwent |
| 9. New machines have a higher capacity, a higher ... power and a ... life. | engine |
| 10. The technical level of our industry ... the | depends upon |
| | made up |

advancements in mechanical engineering.

Exercise 8. Replace the underlined words by their synonyms given in the right column.

- | | |
|--|-----------------------|
| 1. At the outbreak of World War I the number of vehicles in Russia did not exceed 10,000 units. | participated |
| 2. The vehicles were <u>mostly</u> of foreign production. | deliver |
| 3. In 1924 the first Russian trucks <u>took part</u> in the holiday parade on the Red Square. | produce
plant |
| 4. A new Motor Works planned to <u>manufacture</u> at least 150,000 vehicles a year. | mainly
automobiles |
| 5. The Moscow Automobile <u>Works</u> underwent reconstruction to <u>turn out</u> up 25,000 automobiles. | beginning |
| 6. Until 1965 <u>mainly</u> trucks were <u>manufactured</u> in Russia. | machines |
| 7. In 1916 efforts were made <u>to build</u> some Motor Works in our country. | produced
mostly |
| 8. Until 1965 trucks <u>made up</u> 62% of the total production of <u>vehicles</u> in our country. | a lot of
various |
| 9. In 1968 our country <u>held</u> the first place in Europe in the <u>production</u> of trucks. | amounted
construct |
| 10. Now <u>many</u> new types of <u>different</u> machines are being produced in our country. | kept
manufacture |

Exercise 9. Insert the missing prepositions:

1. ... World War I only a few automobiles were produced in Russia.
2. During six years a score ... trucks were delivered.
3. ... the Nizhni-Novgorod Works special service cars ... all types came off the assembly lines.
4. ... World War II the Moscow Motor Works was evacuated ... the East.
5. The automotive industry began developing ... our country after 1917.
6. Before 1917 none ... the Motor Works got down to commercial production.
7. Machines take care ... all the branches ... the national economy.
8. ... the three Five-Year Plan periods the production ... cars doubled.
9. ... 1965 the production ... cars reached the level ... 616,000 units.
10. The production ... trucks held the first place ... Europe.

Exercise 10. Write the following sentences in the Active Voice. Begin with the word or words given in brackets.

Example: Before World War I only a few automobiles **were produced** in Russia.

(Scientists)

Scientists **produced** only a few automobiles in Russia before World War I.

1. In 1916 efforts were made to build some Motor works in Russia. (Engineers)
2. In 1924 very few vehicles were produced at three plants.(Scientists and workers)
3. During World War II the Moscow Motor Works was evacuated to the East. (Our government)
4. At present many new types of different machines are being produced in our country. (Russian people)
5. Machines having higher capacity and engine power will be produced in the near future. (Our scientists and engineers)
6. Until 1965 mainly trucks were manufactured in our country. (Russia)
7. At least 150,000 vehicles a year were planned to manufacture at a new Motor Works in Nizhni-Novgorod. (Our country)
8. Machine-building industry is being developed on a large scale in our country. (Russia).
9. New types of machines are being produced by this plant. (This plant)
10. Tractors are being sold abroad by Belaruss. (Belaruss)

Exercise 11. Answer the questions using the following expressions:

I think that ..., it should be noted that ..., it is no doubt that ..., etc.

1. What does this text deal with?
2. In what cities were a few automobiles produced before World War I?
3. How many cars and trucks were delivered during 1910-1915?
4. When were efforts made to build the Motor Works in Russia?
5. When did the automotive industry begin developing in Russia?
6. At what plants were vehicles produced in 1924-1930?
7. What event held back the development of automotive industry in our country?
8. Where was the Moscow Motor Works evacuated during World War II?
9. When was the pre-war level of automotive industry reached in our country?
10. What can you say about new types of machines?
11. What branches of industry depend on the advancements of mechanical engineering?

Exercise 12. Retell the text using the following expressions:

- | | |
|-----------------------------------|---|
| 1. I am going to speak about ... | Я собираюсь рассказать о ... |
| 2. It should be said that ... | Следует сказать, что ... |
| 3. Now a few words about ... | Сейчас несколько слов о ... |
| 4. Now I`d like to dwell upon ... | Сейчас мне бы хотелось подробно остановиться на ... |
| 5. In conclusion I`d like | |

to speak about...

(or: to say that ...)

Text B "The Car of the Future".

В заключение мне бы хотелось
рассказать о ...(или: сказать, что...)

Vocabulary

- | | |
|--|--------------------------------|
| 1. advantage [qd`vRntiG], n - | преимущество |
| 2. disadvantage [,disqd`vRntiG], n - | недостаток |
| 3. give off , v [`giv`Of] | выделять |
| 4. exhaust fumes [ig`zLst`fjHmz] | выхлопные газы |
| 5. compete [kqm`pJt], v - | конкурировать |
| 6. charge [CRG], v - | заряжать |
| 7. capacity [kq`pxsiti], n | мощность |
| 8. relatively [`relqtivli], adv - | относительно |
| 9. sufficient [sq`fiSnt], a - | достаточный |
| 10. quite [kwait], adv - | вполне, довольно |
| 11. cut down [`kAt`daun], v - | сокращать |
| 12. so far [`sOu`fR] - | пока |
| 13. cater for [`keitq`fL] - | обслуживать |
| 14. services [`sWvisiz], n - | сферы обслуживания |
| 15. liquid gas cylinder [`likwid`gxs`silindq] - | цилиндр с жидким газом |
| 16. internal combustion engine [in`tWnql kqm`bAsCn`enGin] - | двигатель внутреннего сгорания |
| 17. instead of [in`sted qv] - | вместо |
| 18. petrol [`petrql], n - | бензин |
| 19. mixture [`miksCq], n - | смесь |
| 20. save [seiv], v - | экономить |
| 21. hydrogen [`haidrqGqn], n - | водород |
| 22. nitrogen [`naitrqGqn], n - | азот |
| 23. steam engine [`stJm`enGin] - | паровой двигатель |
| 24. virtually [`vWtjuqli], adv - | фактически |
| 25. appearance [q`piqrqns], n - | внешний вид |
| 26. gear box [`giq`bOks] - | коробка передач |
| 27. air pollution [`Fq pq`lHSn] - | загрязнение воздуха |
| 28. fuel [`fjHql], n - | топливо |
| 29. design [di`zain], v - | конструировать |
| 30. ordinary [`Ldinqri], a | обычный |
| 31. device [di`vais], n - | устройство |
| 32. local deliveries [`loukql di`lJvqriz] - | местные доставки |

Task II. Read text B “The Car of the Future”.

3.2 Text B “The Car of the Future”.

At present there is a lot of talk about electric cars, for they have the advantage of giving off no exhaust fumes. The electric car has a long history. The first cars were built at the end of the last century but they could not compete against the internal combustion engines.

Electric cars have some disadvantages. Their batteries are too heavy, take a long time to charge, have too small a capacity and a relatively short life.

Nowadays there are many different electric cars around the world. Some can run 100 km and longer on one charge. This is quite sufficient for town traffic, where cars do not cover long distances.

The first electric cars have already been used in Moscow and in several other cities. So far there are few of them. Now they cater for local deliveries, post offices and the services. Specialists think that in future these cars will be used for town transportation.

At present car manufacturers are looking for new energy and fuel sources. In Moscow there are more than a thousand lorries using liquid gas cylinders instead of petrol tanks, and prototypes of liquid gas buses and taxis have already been designed.

Now, in Moscow new machines are being tested. In their tanks they use fuel mixed with ordinary water by means of special devices. The advantage of such mixture is that it saves fuel and cuts down air pollution.

Recently an unusual car has been tested on American roads. The motor looks like a steam engine but it is fuelled by nitrogen, not steam. Russia, the United States, Germany and Japan are all working on hydrogen engines. Hydrogen is easy to transform and store. It can be transported over large distances using conventional pipelines. In several countries car engines fed by hydrogen have been tested successfully. Tests have also shown that adding five to ten per cent of hydrogen to petrol increases engine efficiency by 40-45 per cent. Specialists think that hydrogen will be the main source of energy for internal combustion engines in near future. Hydrogen resources are virtually unlimited.

In St Petersburg scientists have developed an electric car. In appearance it is like an ordinary Moskvich but it has no gearbox, no accelerator, no fuel tank and no internal combustion engine. The place of the engine is taken by an electric motor. The power of their car is 12 kilowatt.

Exercise 1. Read and remember the definitions of the following words and word combinations:

1. *Gear box* - коробка передач, многозвенный механизм, в котором ступенчатое изменение передаточного отношения

осуществляется при переключении зубчатых передач, размещенных в отдельном корпусе.

Применяется в трансмиссиях транспортных машин.

2. ***Accelerator*** - ускоритель, регулятор количества горючей смеси, поступающей в цилиндр двигателя внутреннего сгорания. Предназначен для изменения частоты вращения вала двигателя (скорости движения трансмиссии).
3. ***Internal combustion engine*** - двигатель внутреннего сгорания, тепловой двигатель, в котором часть химической энергии топлива, сгорающего в рабочей полости, преобразуется в механическую энергию.
4. ***Hydrogen*** - водород, химический элемент VII группы периодической системы Менделеева. Используется как горючее в теплоэнергетике.
5. ***Nitrogen*** - азот, химический элемент V группы периодической системы Менделеева. Используется для многих технологических процессов.
6. ***Battery*** - аккумулятор, устройство для накопления энергии с целью ее последующего использования. Электрический аккумулятор служит для накопления электрической энергии путем превращения ее в химическую с обратным преобразованием по мере необходимости.

Exercise 2. Choose the proper word from the two words given in brackets.

1. At present there is a lot of talk about (mechanical cars, electric cars).
2. **The first cars could not compete against (steam engines, internal combustion engines).**
3. Electric cars take a (long, short) time to charge.
4. In towns electric cars are successfully used as they (cover, do not cover) long distances.
5. The place of an engine in an electric car is taken by an (internal combustion engine, electric engine).
6. Electric cars have some (advantages, disadvantages) in their operation.
7. Specialists think that in future electric cars will be used for (international transportation, town transportation).

8. Specialists think that (hydrogen, petrol) will be the main source of energy for internal combustion engines.
9. Hydrogen is (difficult, easy) to transform and store.
10. The motor of a car tested on American roads is fuelled by (steam, nitrogen).

Exercise 3. Match the terms and their definitions.

- | | |
|-------------------------------|--|
| 1. Gear box | a) the device for accumulating energy for further using. |
| 2. Accelerator | b) the mechanism for changing the speed of the machine. |
| 3. Internal combustion engine | c) the mechanism used for changing the rotational frequency of the engine shaft. |
| 4. Hydrogen | d) a steam engine in which fuel is transformed into mechanical energy. |
| 5. Nitrogen | e) a chemical element used in many technological processes. |
| 6. Battery | f) a chemical element used as fuel in heat and power engineering (теплотехника). |

Exercise 4. Form the Comparative and Superlative Degrees from the following adjectives.

Example: small – smaller – the smallest. Маленький, меньше, самый маленький.

Important – more important – the most important.

Важный, более важный, самый важный.

Long, short, sufficient, easy, ordinary, new, heavy, high, difficult, low.

Exercise 5. Choose the proper form.

1. The first electric car (has been designed, was designed) at the end of the last century.
2. Recently some new electric cars (were constructed, have been constructed) in our country.
3. In future electric cars (were used, will be used) for town transportation.
4. Nowadays different electric cars (were designed, are being designed) around the world.
5. A car tested on American roads (is fuelled, will be fuelled) by nitrogen, not steam.
6. In several countries car engines fed by hydrogen (will be tested, have been tested) successfully.
7. Now new machines (were tested, are being tested) in our country.

8. Specialists think that in future electric cars (are used, will be used) for town transportation.
9. At present scientists (were looking, are looking) for new energy and fuel sources.
10. Hydrogen (can be transported, will not be transported) over large distances.

Task II. Use the Passive Voice instead of the Active Voice.

Помните, что страдательный залог образуется с помощью вспомогательного глагола **to be** в соответствующем времени и **причастия прошедшего времени** основного глагола.

Example: American scientists **have tested** a new electric car.

Американские ученые **испытали** новую электрическую машину.

A new electric car **has been tested** by American scientists.

Новая электрическая машина была испытана американскими учеными.

Scientists **will use** nitrogen as fuel for engines.

Ученые **будут использовать** азот в качестве топлива для двигателей.

Nitrogen **will be used** as fuel for engines by scientists.

Азот **будет использоваться** в качестве топлива.

1. Engineers have already used electric cars in several cities.
2. Car manufacturers have found new energy and fuel sources for cars.
3. In future specialists will use electric cars for town transportation.
4. Scientists have made prototypes of liquid gas buses and taxis.
5. Internal combustion engines will use hydrogen as the main source of energy.
6. In electric cars an electric motor has taken the place of the engine.
7. Conventional pipelines will transport hydrogen over large distances.
8. Car manufacturers have already tested electric cars on Moscow roads.
9. Specialists will add hydrogen to petrol to increase the efficiency of engines.
10. In St Petersburg scientists have developed a new electric car.

Exercise 7. Agree or disagree with the following statements. Use the expressions: *"I think so"*, *"I don't think so"*. Say the correct version.

1. Electric cars do not give off exhaust fumes.
2. Electric cars have a small capacity and a relatively short life.
3. Electric cars do not have a long history.
4. Electric cars cannot cater for local deliveries, post offices and services.
5. Electric cars have no gearbox, accelerator, and fuel tank.
6. Lorries cannot use liquid gas cylinders instead of petrol tanks.
7. Car engines fed by hydrogen have been successfully tested in several countries.
8. Hydrogen cannot be transported over large distances.
9. Hydrogen is easy to transform and store.

10. Russia, the United States of America, Germany and Japan are all working on petrol engines.

Exercise 8. Using the information of the text, characterize:

- a new car developed in St Petersburg.
- a car tested on American roads.

Exercise 9. Retell the text using the following key words and word combinations:

1. The advantages of the electric cars.
2. Disadvantages.
3. Run on one charge
4. So far
5. Look for
6. Fuel mixed with ordinary water
7. Hydrogen
8. Nitrogen
9. Hydrogen resources
10. St Petersburg scientists

Text C “Machines for Road Making”.

VOCABULARY

1. performance , n [pɜːfɔːmɑːns]	работа, выполнение
2. actuate , v [ˈæktʃueɪt]	приводить в действие
3. shape , n [ʃeɪp]	форма
4. handle , v [ˈhændl]	перемещать,
транспортировать	
5. operating member [ɒpəˈreɪtɪŋˈmembə]	рабочий орган
6. crusher , n [krʌʃə]	дробилка
7. jaw , n [dʒɔː]	щека, зажим, захват
8. roll , n [rɒl]	валец, валик
9. power shovel [ˈpaʊəˈʃəvl]	одноковшовый экскаватор
10. bucket , n [ˈbʌkɪt]	ковш
11. drum , n [drʌm]	барабан
12. blade , n [bleɪd]	отвал, лопасть
13. roller , n [ˈrɒlə]	каток
14. invaluable , a [ɪnˈvæljuəbl]	неоценимый
15. essentially , adv [ɪˈsenʃli]	главным образом, по существу
16. screw , n [skruː]	винт, шнек, гайка

17. bearing , n [ˈbɛəriŋ]	подшипник
18. running gear [ˈrʌniŋˈgiː]	ходовой механизм
19. purpose , n [ˈpʊrps]	цель
20. facilities , n [fəˈsɪlɪtɪz]	оборудование
21. crawler , a [krɔːlɪ]	гусеничный
22. wheel-mounted [ˈwiːlˈmaʊntɪd]	колесный
23. trailer , n [ˈtreɪlɪ]	прицеп
24. semi-trailer , n [ˌsemiˈtreɪlɪ]	полуприцеп
25. winch , n [wɪnʃ]	лебедка
26. hoist , n [hɔɪst]	таль, подъемник
26. ripper , n [ˈrɪpɪ]	рыхлитель
27. elevating grader [ˈelɪveɪtɪŋ]	грейдер элеватор
28. revolving shovel [rɪˈvɒlviŋˈʃavl]	вращающийся одноковшовый экскаватор
29. sweeper , n [swiːpɪ]	подметальная машина
30. continuous action [kənˈtɪnjuəsˈækʃn]	непрерывное действие
31. intermittent action [ˌɪntɪˈmɪtnt]	периодическое действие
32. prime mover [ˈpraɪmˈmʊvɪ]	первичный двигатель
33. mobility [məʊˈbɪləti]	подвижность

Task III. Read text C: “Machines for Road Making”.

3.3 Text C: “Machines for Road Making”.

1. A machine is a combination of various mechanisms designed to perform certain rational movements for energy conversion or performance of useful work. There are machines which transform energy into mechanical work and machines which receive mechanical energy to actuate the operating members employed to change the properties, condition, shape or position of the material being handled.

Operating members engaged directly in the performance of work are crusher jaws and rolls, power shovels buckets, drums and blades of a mixer, road roller rolls, etc.

Machines are invaluable in our national economy for realizing the process of production and increasing the labour productivity.

2. Machines and mechanisms are composed of different units and parts.

A machine consists essentially of an engine, a transmission system, operating members, a running gear and a complex control system.

Parts, which performed similar functions in different machines, are called general-purpose parts. They are screws, bolts, gear wheels, bearings, etc.

3. Machines employed for road making can be classified according to their purpose as follows:

- a) Transporting facilities – crawler and wheel-mounted tractors, trucks, general and special purpose trailers and semi-trailers.
- b) Materials handling equipment – winches, cranes, hoists, loading and unloading machines, etc.
- c) Machines for land clearing and earthwork – rippers, bulldozers, scrapers, elevating graders, revolving shovels, etc.
- d) Machines for highway maintenance – sweepers, snow and ice sweepers, repair trucks, etc.

All these machines can be classified by **the working process**:

continuous action and intermittent action;

the prime mover:

driven by electric motors and driven by internal combustion engines;

the mobility :

stationary and mobile (trailers, semi-trailers, pendant (навесные) and self-powered).

4. Machines used in road construction should satisfy definite design, manufacturing and operational requirements, of which reliability and efficiency are the principal ones. All these requirements are interrelated in one way or another. For example, the reliability and life of a machine depends on the design and shape, as well as on the quality of the material and the manufacturing techniques adopted to process the machine parts. A high operating capacity of a machine is ensured by improved designs.

5. In designing a machine much attention should be given to providing favourable and safe conditions for the driver.

Requirements include:

- a) Comfortable seat, good visibility and illumination of the operating member and the work.
- b) Elimination of vibration and noise.
- c) Convenient control of levers and pedals.
- d) A dust-proof and well-ventilated driver's cab for operation in dusty environments, etc.

Exercise 1. Read and remember the definitions of the terms:

1. ***Running gear*** - ходовой механизм, совокупность элементов шасси, образующих тележку транспортных, дорожно- строительных машин и др. В ходовую часть машины входят: рама, оси, подвеска, колеса с шинами.

2. ***Roller*** - каток дорожный, прицепная или самоходная машина для уплотнения грунтов, дорожных оснований и покрытий вальцами (гладкими, решетчатыми, с шипами).
3. ***Bearing*** - подшипник, опора для цапфы вала или вращающейся оси. Различают подшипники качения (внутреннее и наружное кольца, между которыми расположены тела качения - шарики или ролики) и скольжения (например втулка-вкладыш, вставленная в корпус машины).
4. ***Winch*** - лебедка, машина для подъема или перемещения грузов канатом, навиваемым на барабан. Бывают стационарные лебедки и передвижные. Привод ручной или от двигателя.
5. ***Hoist*** - таль, компактная подвесная подъемная лебедка. Привод тали ручной, электрический и пневматический.
6. ***Scraper*** - скрепер, прицепная или самоходная землеройно-транспортная машина, которая рабочим органом – ковшом- послойно срезает грунт с поверхности, транспортирует его и разгружает в отвал или разравнивает.
7. ***Grader*** - грейдер, прицепная или самоходная машина для планировки и профилирования площадей и откосов, разравнивания и перемещения грунта, сыпучих материалов при строительстве и ремонте дорог, гидротехнических сооружений и т.п. Рабочий орган – отвал (длина 2,5 – 5,3 м).
8. ***Revolving shovel***- вращающийся одноковшовый экскаватор, землеройная машина, используемая главным образом для разработки мягких горных пород в массиве или скальных пород в раздробленном состоянии.
9. ***Ripper*** - рыхлитель, служит для рыхления плотных и мерзлых грунтов. Основные типы: статические (рабочий орган – стальные стойки высотой до 1,5 м, навешиваемые обычно на трактор) и динамические (рабочий орган – клин, забиваемый в грунт и погружаемый вибраторами).
10. ***Crusher*** - дробилка, машина для дробления твердых материалов, главным образом минерального сырья. По форме дробящего органа

дробилки подразделяются на: щековые, конусные, валковые, молотковые, роторные, стержневые.

11. **Crane** - кран, грузоподъемная машина циклического действия для подъема и горизонтального перемещения повешенных грузов на небольшие расстояния. Различают мостовые, козловые, башенные, консольные, порталные и др.

12. **Drum** - барабан, деталь машины и сооружений в форме полого цилиндра, конуса или многогранника.

Exercise 2. Match the terms and their definitions.

- | | |
|------------|--|
| 1. Scraper | a) a simple suspension-type small-size mechanism. |
| 2. Grader | b) a machine for crushing raw materials. |
| 3. Crane | c) trailer or self-powered machine for slice-by-slice cutting of soil. |
| 4. Crusher | d) a machine for lifting and handling loads. |
| | e) a trailer or self-powered machine for compacting soil, road beds and surfaces. |
| 5. Hoist | f) a trailer or self-powered machine for laying earth-beds, for shaping surfaces and slopes, for leveling and trans- |
| 6. Roller | porting soil and loose materials, etc. |

Exercise 3. Find the equivalents for the following word combinations in the text.

Рациональные движения для превращения энергии; изменять свойства, состояние, форму или положение перемещаемых материалов; рабочие органы, занятые непосредственно выполнением работы; сложная система управления; гусеничные и колесные тракторы; прицепы и полуприцепы для специальных целей; машины для земляных работ и расчистки почвы; машины для обслуживания дорог; надежность и срок службы машин; качество материала и методы производства; удобное управление рычагами и педалями.

Exercise 4. Use attributive clauses instead of Participle II.

Example: The machine tested on American roads has the engine fuelled by nitrogen.

The machine which has been tested on American roads has the engine which is fuelled by nitrogen.

1. In several countries car engines fed by hydrogen have been tested successfully.

2. Tests performed in different countries were a great success.
3. Batteries used in electric cars are too heavy and take long time to charge.
4. The first cars built at the end of the last century could not compete against the internal combustion engines.
5. The electric car developed in Saint Petersburg has no gearbox.
6. Operating members of machines engaged directly in the performance of work are numerous.
7. Parts performed similar functions in different machines are called general-purpose parts.
8. Machines employed for road construction can be classified by their purpose.
9. Machines used in road construction should satisfy definite operational requirements.

Exercise 5. Find the Gerund in the text.

Помните, что Герундий образуется с помощью окончания “-ing”, добавляемого к инфинитиву глагола без частицы “to”. На русский язык чаще всего переводится отглагольным существительным или неопределенной формой глагола. Перед Герундием часто используется предлог. Например:

Stop – останавливать, stopping – остановка, for stopping - для остановки;
 Slow down – замедлять, slowing down - замедление, by slowing down – путем замедления.

Exercise 6. Use the Gerund instead of the Infinitive.

Example: Various mechanisms of the machine are used to perform useful work.
 Various mechanisms of the machine are used for performing useful work.

1. Machines are invaluable in our national economy to increase labour productivity.
2. Machines are used to clean roads.
3. There are machines which are used to transform energy into mechanical work.
4. Nowadays the main task of mechanic engineers is to design new reliable and highly efficient machines.
5. Technological machines are used to produce building materials and products.
6. Machines are employed to increase labour productivity.
7. Different machines are being produced by our engineers to facilitate the work of man.
8. A score of trucks were developed in our country to transport different building materials.

Exercise 7. Look through the text and write the number of the paragraph that deals with the following topics:

- a) General characteristics of the machine;
- b) Classification of machines;
- c) Machine elements;
- d) Requirements for the machine design;
- e) General requirements to the machines.

Exercise 8. Look through the text and find the information on the following aspects:

- 1. Operating members of machines;
- 2. General-purpose parts of machines;
- 3. Machines used for earthwork;
- 4. Working process of road-making machines;
- 5. The mobility of machines.

Task IV. Do you agree or disagree with the following opinion? Write an essay to prove your point of view.

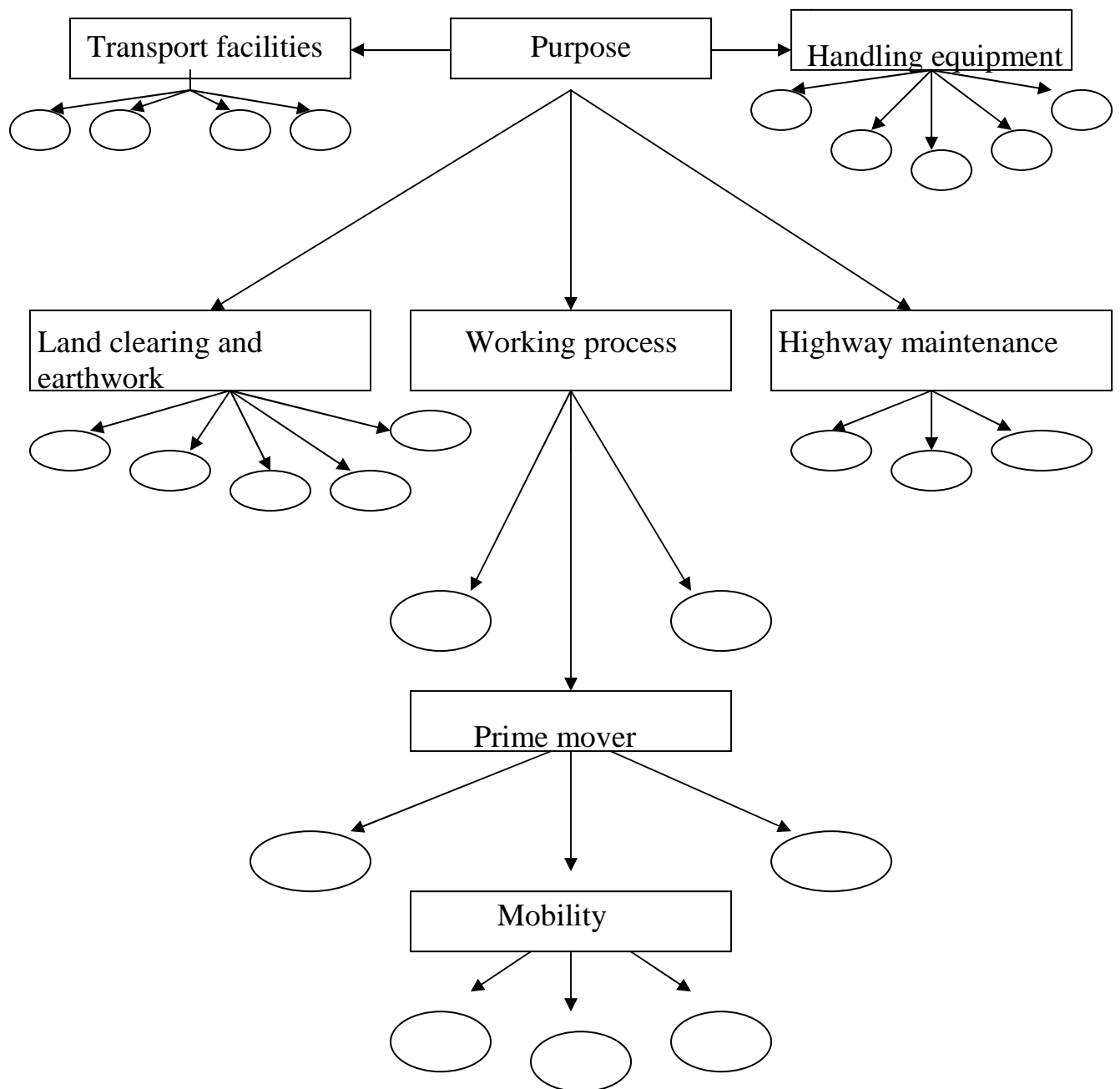
Machines are invaluable in our national economy.

Task V. Write down the key sentences from each paragraph.

Exercise 9. Write your own variant of the summary of the text.

Example: The paragraph I am going to review deals with *the classification of machines*. It should be said that *there are different types of machines used in various branches of our national economy*. They may be classified according to *the purpose and the working process*. As for the purpose machines may be used *for transporting or handling different building materials, for earthwork and for clearing operations*. We know such machines as *tractors, cranes, bulldozers, sweepers, etc.* In conclusion I'd like to say that *machines facilitate the work of man*.

Exercise 10. Build up the scheme of the classification of road-making machines.



Texts for Self-Study and Analysis

Text 1

How to Put a Frozen Car into Motion

By Peter Tempest

British car manuals offer advice on starting from cold, but say nothing about starting from freezing. Yet this, as I have learned from the experience of three Russian winters, is a different thing.

How do drivers here meet the challenge of the freeze from November to April? In several ways.

Way one – is to lay the car up. Hundreds of private cars are not used in winter.

Way two – the most popular – was seen in the Russian film “Nine Days Of One Year”, where nuclear scientist Gusev goes off to work taking his hat and coat and a bucket of boiling water off the gas stove.

Every morning Muscovites may be seen pouring a bucket of hot water into the car radiators they have drained the previous night.

This method gives instant starting, but has one important defect – you have to go out to warm up the engine every two or three hours during the day, and if you forget ...

The way three – is preheating the carburetor with a fitted paraffin burner.

The way four – is to stop a passing lorry and ask for a tow. This works, provided (если) you released the handbrake the previous night.

If you left it on, you will find it frozen solid and the car will not move.

Way five – most unorthodox – is my own. It requires a kettle of boiling water and two magazines.

I place the magazines to stop water dripping on to the starter motor and generator and then slowly pour the kettle over the carburetor and inlet manifold (впускной коллектор).

The engine should start easily.

If it does not, another kettle after a pause for the battery to recover.

Remove the wet magazines and leave them in the car where they will freeze as stiff as boards and be easier to use the next time.

Be careful not to splash water on to the throttle linkage (дроссель рычажного механизма).

Other tips for sub-zero monitoring: empty the windscreen washer bottles, keep the door-locks well oiled, the battery well charged and leave the handbrake off, but the engine in gear.

If it is going to be a very cold night, thick ice can be scraped of the windscreen with any piece of hard plastic.

When you have got the car going you can drive out of town and go fishing in the Moskva River, not from the bank but through a hole in the ice.

(From "Morning Star")

Text 2

Driving a Car in England

It is about the same to drive a car in England as anywhere else. To change a punctured (проколота) tyre in the wind and rain gives about the same pleasure outside London as outside Rio de Janeiro; it is not more fun to try to start up a cold motor with the handle (рукоять) in Moscow than in Manchester; the roughly 50-50 proportion between driving an average car and pushing it is the same in Sydney and Edinburgh.

There are, however, a few characteristics which distinguish the English motorists (автомобилист) from the continental, and some points which the English motorists have to remember.

1. In English towns there is a thirty miles an hour speed-limit and the police keep a watchful eye (бдительно следит) on law-breakers. The fight against reckless driving (неосторожная езда) is directed extremely skillfully and carefully according to the very best English detective traditions. It is practically impossible to find out whether you are being followed by a police car or not. There are, however, a few indications which may help people of extraordinary intelligence and with very keen powers of observation:

- a) The police always use a 13 h.p. blue Wolseley car;
- b) three uniform policemen sit in it; and
- c) on these cars you can read the word POLICE written in large letters in front and rear, all in capitals (заглавными буквами) – lit up during the hours of darkness.

2. I think England is the only country in the world where you have to leave your lights on, even if you park in a brilliantly lit-up street. The advantage being that your battery gets exhausted, you cannot start up again and consequently (поэтому) number of road accidents is greatly reduced. Safety first!

3. Only motorists can answer this puzzling question: what are taxis for? A simple pedestrian knows that they are certainly not there to carry passengers.

Taxis, in fact, are a Christian institution. They are here to teach drivers modesty and humanity. They teach us never to be overconfident, they remind us that we never can tell what the next moment will bring for us, whether we shall be able to drive on, or a taxi will bump into us from the back or the side.

4. There is a huge ideological warfare going on behind the scenes of the motorist world.

Whenever you stop your car in the City, the West End or many other places, two or three policemen rush at you and tell you that you must not park there. Where may you park? They shrug their shoulders. There are a couple of spots on the South Coast and in a village called Minchinhampton. Three cars may park there for half an hour every other Sunday morning between 7 and 8 p.m.

The police are perfectly right. After all, cars have been built to run, and run fast, so they should not stop.

Text 3

Thumbing a Lift

To hitch-hike (путешествовать бесплатно на попутных машинах) successfully in any country you must be able to do two things: attract attention and at the same time convince the driver at a glance that you do not intend to rob or murder him. To fulfill the first requirement you must have something to distinguish you from all other hikers. A serviceman, for instance, should wear his uniform, a student - his scarf. In a foreign country an indication of your nationality will also attract a driver's attention.

When I hitch-hiked 9,500 miles across the United States and back recently I wore a trench-coat and carried a black umbrella. My suitcase was decorated with British flags.

But even with careful preparation the task is not easy. You should be prepared to wait a little, for there are drivers who do not like hitch-hikers. In America my average wait was half-hour and my longest two hours, but I heard of people waiting all day.

Not all the drivers who stop for you are nice normal people. On one occasion I found myself driving with two boys of about nineteen who were on the run from Police. You may find yourself in the car of a fascist fanatic, or just a bad driver.

You cannot tell, of course, until you are in the car.

If the hitch-hiker in the United States will remember that he is asking the drivers to give him a free ride and is prepared to give entertainment and company, and is not going to sleep, he will see hospitality. It will also help if he can drive - I think that I drove myself about 4,500 of these 9,500 miles I hitch-hiked in the States.

Text 4

Travelling by Car

There is nothing better than to travel by car. When you are in an aeroplane, you have to be driven by someone else; travel by car is a more personal experience, for there you can drive yourself. You just sit down at the wheel, switch on the motor, step on the pedal with your foot and off the car goes. You can go as slowly or as fast as you wish, stop when and where you choose, you park the car on the side of the road or street, get out and go where you like.

It is quite true that driving a car has some disadvantages. In town there are traffic

“jams”, roundabouts (круговое движение), detours (объезды) and so on. It is not altogether pleasant when you ride on a bumpy road or get a flat tire, or still worse, when you get stuck in the mud.

But what can be better than a spin (прогулка) in a car on a week-end with your friend? As soon as you get out of the crowded town and see the long wide road opening up before you, what a thrill it is to feel the car rush forward at a touch of your foot, to feel the wind in your face, to see houses, trees and people flash past, to feel the real joy of speed.

Then, of course, you see much more of the country than you do in a plane. Suppose you are on vacation and have decided to take a 700-800 mile trip down South in a car. What magnificent views you behold on your way – the cheerful fields, the road winding its way up the mountain with steep, gray cliffs on one side and a deep precipice (пропасть) on the other, the shining expanse (гладь) of the sea wrapped in a blue noonday haze, the woods, the rows of acacia that stretch along the streets of the towns that you pass through.

Indeed, your impressions are unforgettable.

Motor Fun

An Automobile Story

A tourist who was going by car through the country saw, walking in front of him, a man followed by a dog. As the car drew near them the dog suddenly began to cross the road. The poor animal was hit by the car and killed.

The automobilist stopped his car and approached the man.

“I am very sorry that this has happened,” he said. “Will ten dollars be enough?”

“Oh, yes,” said the man, “ten dollars will be quite enough!”

The man put the money in his pocket and as the car disappeared in the distance, he looked down at the dead animal and thought: “I wonder whose dog it was.”

He Learned Motoring

Nick had bad marks. Father said, "If you learn well, I will give you my car." All right!" said Nick. "I will learn well."

In a month Nick got bad marks again. Father asked him, "Nick, why have you bad marks? What did you do this month?"

"I learned motoring," was the answer.

Two Drivers

Two motorcars met in a very narrow lane in London. Neither of the drivers wanted to reverse and clear the road.

The driver of the first car took out the newspaper "Times" and began reading.

In an hour the second driver asked politely:

"When you finish reading, won't you give the newspaper to me?"

She Has Left Her Glasses At Home

When the evening party was over, the hostess offered to drive one of her guests home. It was a cold night, and frost settled thickly over the windscreen (ветровое стекло). Twice there was nearly an accident, and the nervous guest suggested that it might help if the frost was cleared from the windscreen.

«That wouldn't help much,» answered the driver. «Like a fool I've left my glasses at home!»

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Unit IV

Automation of Technological Process and Production

Specialization:	Automation of Technological Process and Production
Grammar:	Present Indefinite Tense. Active and Passive Voice. Prepositions. Articles. Future Indefinite Tense. Passive Voice. Modal Verbs. Plural Form. Past Indefinite Tense. Present Perfect Tense. Infinitive after Adjectives. Infinitive of Purpose. Numerals.

WHAT DO COMPUTER ANALYZERS DO?

Automation is regarded as a must for the industrial survival of each society. Nowadays it is impossible to imagine our life without computers which are widely used in every field of human activity.

Automation must become accepted by senior management as being strategic - a competitive weapon whose implementation will have a long-term positive impact on the business. So, there is no doubt that computer analyzers' work is extremely important because of a variety of functions they accomplish in different

spheres of knowledge and activities such as science, business, management, administration, etc.

For automation to be effective, data integration must occur. Organizational and technological barriers among functions need to be brought down and islands of automation bridged.

What is your opinion about the role of automation nowadays?

How can you appreciate computer analyzers' service?

Do you think it is very prestige today? Why?

Text A. Computer System

Vocabulary

1. **computer system**, n. [kəm'pjʊ:tə sis'tim] – компьютерная система
2. **converter**, n. [kən'və:tə] – преобразователь
3. **data processing**, n. ['deɪtə prə'sesiŋ] – обработка информации
4. **data**, n. ['deɪtə] – данные
5. **development**, n. [di'veləpmənt] – развитие
6. **device**, n. [di'vaɪs] – устройство
7. **hardware**, n. ['hɑ:dwɛə] – аппаратура, «железо»
8. **high-speed**, adj. ['haɪ-spi:d] – высокоскоростной
9. **industry-standard**, adj. ['ɪndəstri-'stændəd] – промышленный
10. **item**, n. ['aɪtəm] – отдельный элемент, единица
11. **lengthy**, adj. ['lenθi] – сложные, долгие
12. **line printers**, n. [laɪn 'prɪntəz] – линейные принтеры
13. **operating system**, n. ['ɒpreɪtɪŋ sis'tim] – операционная система
14. **oscilloscope device**, n. ['ɒsɪləskəʊp di'vaɪs] – осциллоскопическое устройство
15. **peripheral devices**, n. [pə'rɪfərəl di'vaɪsɪz] – периферийные устройства
16. **printing device**, n. ['prɪntɪŋ di'vaɪs] – печатающее устройство
17. **purpose**, n. ['pə:pəs] – цель, задача
18. **set**, n. [set] – набор
19. **software**, n. ['sɔftwɛə] – программное обеспечение
20. **storage medium**, n. ['stɔ:ridʒ 'mi:djəm] – устройство хранения
21. **terminal device**, n. ['tə:minəl] – терминал
22. **to add**, v. [æd] – добавлять
23. **to allow**, v. [ə'laʊ] – позволять
24. **to include**, v. [ɪn'klu:d] – включать в себя
25. **to input**, v. ['ɪnpʊt] – вводить
26. **to output**, v. ['aʊtpʊt] – выводить
27. **to perform**, v. [pə'fɔ:rm] – выполнять, совершать
28. **to process**, v. [prə'ses] – обрабатывать
29. **to provide**, v. [prə'vaɪd] – обеспечивать
30. **to require**, v. [rɪ'kwaɪə] – требовать
31. **to retrieve**, v. [rɪ'tri:v] – извлекать, выискивать

32. to store , v. [ˈstɔː] –	сохранять
33. tool , n. [tuːl] –	инструмент
34. typewriter , n. [ˈtaɪp-raɪtə] –	вводящее текст устройство

Task I. Read text A “Computer System”

A computer system is a collection of components that work together to process data. The purpose of a computer system is to make it as easy as possible for you to use a computer to solve problems. A functioning computer system combines hardware elements with software elements. The hardware elements are the mechanical devices in the system, the machinery and the electronics that perform physical functions. The software elements are the programs written for the system; these programs perform logical and mathematical operations and provide a means for you to control the system. Documentation includes the manuals and listings that tell you how to use the hardware and software.

Collectively these components provide a complete computer system: system hardware + system software + system documentation = computer system. Usually, a computer system requires three basic hardware items: the computer, which performs all data processing; a terminal device, used like a typewriter for two-way communication between the user and the system; and a storage medium for storing programs and data. These three devices - the computer, the terminal and the storage medium — are the required hardware components of any computer system.

Optional peripheral devices are added to a computer system according to the specific needs of the system users. For example, computer systems that are used primarily for program development may have extra storage devices and a high-speed printing device. Computer systems used in a laboratory may have graphics display hardware, an oscilloscope device, and an analog-to-digital converter. Computer systems that provide (or use) information in conjunction with another kind of computer system usually have a magtape device, because magtape device is an industry-standard storage device.

Peripheral devices are categorized as input/output (I/O) devices since the functions they perform provide information (input) to the computer, accept information (output) from the computer, or do both. Line printers are output devices because they perform only output operations. Terminals and storage devices are input/output devices because they perform both input and output operations.

System software is an organized set of supplied programs that effectively transform the system hardware components into usable tools. These programs

include operations, functions, and routines that make it easier for you to use the hardware to solve problems and produce results. For example, some system programs store and retrieve data among the various peripheral devices. Others perform difficult or lengthy mathematical calculations. Some programs allow you to create, edit, and process application programs of your own.

System software always includes an operating system, which is the "intelligence" of the computer system. Usually the system software includes one or several language processors.

Exercise 1. Match the following words and word combinations from two columns.

- | | |
|-----------------------|-----------------------------|
| 1. operating system | a. промышленный |
| 2. supplied programs | b. базовые элементы |
| 3. industry-standard | c. дополнительные программы |
| 4. high-speed | d. операционная система |
| 5. basic items | e. высокоскоростной |
| 6. line printers | f. линейный принтер |
| 7. computer system | g. механические устройства |
| 8. mechanical devices | h. компьютерная система |
| 9. storage medium | i. память компьютера |
| 10. hardware elements | j. терминал |
| 11. terminal device | k. элементы аппаратуры |

Task II. Read the definitions of the following words and word combinations and put them into the phrases.

Computer system – компьютерная система.

Mechanical devices – механические устройства.

Hardware elements – элементы аппаратуры.

Software elements – элементы программного обеспечения.

Storage medium – устройства хранения информации, память компьютера.

Operating system - операционная система

Terminal device – терминал (вводящие устройства)

Peripheral device – дополнительное устройство.

Printing device – печатающее устройство, принтер.

Supplied programs – дополнительные программы.

Basic items – базовые элементы (программы).

Line printers - линейные принтеры.

Exercise 2. Use the verbs in brackets in the Present Indefinite Active or Passive.

1. A computer system (to be) a collection of components that work together to process data.
2. Peripheral devices (to categorize) as input/output (I/O) devices according to the functions they perform.
3. A functioning computer system (to combine) hardware elements with software elements.
4. The software elements (to be) the programs written for the system.
5. Optional peripheral devices (to add) to a computer system according to the specific needs of the system users.
6. These programs (to include) operations, functions, and routines that make it easier for you to use the hardware to solve problems and produce results.
7. Computer systems that (to use) primarily for program development may have extra storage devices and a high-speed printing device.
8. Some programs (to allow) you to create, edit, and process application programs of your own.
9. These programs (to perform) logical and mathematical operations and provide a means for you to control the system.
10. System software (to be) the "intelligence" of the computer system.

Exercise 3. Put the given verbs – *to provide, to include, to require, to perform, to process* - into the gaps.

1. A computer system is a collection of components that work together to ... data.
2. Usually, a computer system ... three basic hardware items.
3. Processing data ... much attention and care.
4. To ... comfort to the user, computers are needed.
5. Collectively these components ... a complete computer system.
6. The computer ... all data processing .
7. Working on a computer ... many steps.
8. Documentation ... the manuals and listings that tell you how to use the hardware and software.
9. Computers can ... many different tasks.
10. A computer is needed to ... data.

Exercise 4. Insert the missing prepositions:

1. A computer system is a collection ... components.
2. Many components work together ... process data.

3. The software elements are the programs written ... the system.
4. A functioning computer system combines hardware elements ... software elements.
5. The hardware elements are the mechanical devices ... the system, the machinery and the electronics that perform physical functions.
6. Optional peripheral devices are added ... a computer system.
7. According ... the specific needs ... the system users different devices are used.
8. Peripheral devices are categorized ... input/output (I/O) devices according to the functions they perform.
9. Peripheral devices can provide information (input) ... the computer, accept information (output) ... the computer, or do both.
10. Computer systems that are used primarily ... program development may have extra storage devices and a high-speed printing device.

Exercise 5. Put *a/an* or *the* in the following sentences:

1. ... computer system is ... collection of components that work together to process data.
2. ... hardware elements are ... mechanical devices in ... system, ... machinery and ... electronics that perform physical functions.
3. System software is ... organized set of supplied programs.
4. Computer systems used in ... laboratory may have graphics display hardware.
5. System software always includes ... operating system, which is ... "intelligence" of the computer.
6. These three devices - ... computer, ... terminal and ... storage medium — are ... required hardware components of any computer system.
7. ... software elements are ... programs written for the system.
8. ... computer system requires three basic hardware items: ... computer, ... terminal device and ... storage medium.
9. Optional peripheral devices are added to ... computer system according to ... specific needs of ... system users.
10. ... magtape device is ... industry-standard storage device.

Task III. Find the false sentences using the information from the text. Correct them.

1. The purpose of a computer system is to make it as easy as possible for you to use a computer to solve problems.
2. The hardware elements are the programs written for the system.
3. The software elements are the mechanical devices in the system.

4. Line printers are input devices because they perform only input operations.
5. System software is an organized set of supplied programs that effectively transform the system hardware components into usable tools.
6. System hardware always includes an operating system, which is the "intelligence" of the computer system.
7. Computer systems that are used primarily for program development may have extra storage devices and a high-speed printing device.
8. Some components work together to process data.
9. Peripheral devices are categorized into input/output (I/O) devices since the data they process.
10. Computer programs perform logical and mathematical operations and provide a means for you to control the system.

Exercise 6. Match the beginnings of the sentences to their ends using the information from the text.

- | | |
|---|---|
| 1. The purpose of a computer system is ... | a) that effectively transform the system hardware components into usable tools. |
| 2. Line printers are output devices because ... | b) which is the "intelligence" of the computer system. |
| 3. Documentation includes the manuals and listings ... | c) they perform only output operations. |
| 4. System software is an organized set of supplied programs ... | d) graphics display hardware, an oscilloscope device, and an analog-to-digital converter. |
| 5. System software always includes an operating system ... | i) that tell you how to use the hardware and software. |
| 6. Computer systems used in a laboratory may have ... | f) to make it as easy as possible for you to use a computer to solve problems. |
| 7. A computer system is a collection of components ... | g) that work together to process data. |

Exercise 7. Translate into English.

1. Компьютерная система – это совокупность компонентов, которые работают вместе с целью обработки информации.
2. Цель компьютерной системы – обеспечение удобства пользователя.
3. В работе компьютерной системы сочетаются элементы аппаратуры с программным обеспечением.

4. Элементы программного обеспечения – это программы, записанные в системе.
5. Элементы аппаратного обеспечения – это механические устройства, которые выполняют физические функции.
6. Обычно компьютерная система требует три базовые единицы аппаратуры.
7. Дополнительные периферийные устройства добавляются к компьютеру в зависимости от специфических нужд пользователя.
8. Периферийные устройства подразделяются на вводящие и выводящие согласно выполняемым ими функциям.
9. Некоторые программы способны выполнять арифметические и логические операции.
10. Программное обеспечение - это упорядоченный набор программ, которые эффективно трансформируют аппаратуру в пригодные для использования инструменты.
11. Система программного обеспечения всегда включает в себя операционную систему, которая является «интеллектом» компьютера.

Exercise 8. Answer the following questions.

1. What is the text about?
2. What is a computer system?
3. What elements does a functioning computer system combine?
4. What are the hardware elements?
5. What are the software elements?
6. What are three basic hardware items of an ordinary computer system?
7. Why are optional peripheral devices added to a computer system?
8. What are the examples of the most usual optional peripheral devices?
9. Speak about input/output devices.
10. What is system software?
11. What is called the “intelligence” of the computer system?

Task IV. Make short dialogues using the model. Ask your partner about hardware, computer system, optional peripheral devices, input/output devices, operating system etc.

Model: - What can you say about system software?

- **As far as I know**, system software is an organized set of supplied programs that effectively transform the system hardware components into usable tools.

Task V. Retell the text using the following expressions.

- *I'm going to speak about...*
- *I'd like to speak about...*
- *First of all, it's necessary to say that ...*
- *I'd like to tell you some words about...*
- *I should like to tell you a few words about...*
- *It should be said that...*
- *It's interesting to note that ...*
- *It's important to know that ...*
- *I'd like to add that...*
- *In conclusion, it is necessary to say that...*
- *In conclusion I should like to say that...*

Text B. Computer Networks

Vocabulary

- | | |
|---|------------------------------------|
| 1. ability , n. [əˈbiliti] – | возможность |
| 2. access , n. [ˈækses] – | доступ |
| 3. graphics screen , n. [ˈgræfiks skri:n] – | экран с графической разверткой |
| 4. bulletin board , n. [ˈbulitin bɔ:d] – | материнская плата |
| 5. close , adv. [klaʊz] – | близко |
| 6. database , n. [ˈdeitəbeis] – | база данных |
| 7. disc-system , n. [ˈdisk-sisˈtim] – | системный диск |
| 8. environment , n. [inˈvaɪərənmənt] – | окружающая среда, окружение |
| 9. fibre optics , n. [ˈfaɪbə ˈɒptiks] – | фиброволокно |
| 10. impact , n. [ˈɪmpækt] – | удар, столкновение, попадание |
| 11. interface , n. [ɪntəˈfeɪs] – | интерфейс |
| 12. local area networks , n. [ˈləʊkəl ˈɛəriə ˈnetwɜ:k] – | локальная сеть |
| 13. network , n. [ˈnetwɜ:k] – | сеть |
| 14. query , n. [ˈkwɪəri] – | вопрос, запрос |
| 15. software protocols , n. [ˈsɔftweə ˈprəʊtəkɒlz] – | протоколы программного обеспечения |
| 16. to blur , v. [blɜ:] – | затемнить[ся], стереть[ся] |
| 17. to carry , v. [ˈkæri] – | доставлять |
| 18. to connect , v. [kəˈnekt] – | соединять |
| 19. to distribute , v. [disˈtribju:t] – | распределять |
| 20. to drop , v. [ˈdrɒp] – | падать, опускаться[ся] |
| 21. to exchange , v. [ɪksˈtʃeɪndʒ] – | обменивать[ся] |
| 22. to handle , v. [ˈhændl] – | доставлять |
| 23. to improve , v. [ɪmˈpru:v] – | улучшать |
| 24. to link , v. [lɪŋk] – | связывать |
| 25. to parse , v. [pɑ:z] – | делать детальный разбор |

26. to reduce , v. [ri'dju:s] –	уменьшать[ся]
27. to split , v. [split] –	разделять[ся]
28. to transmit , v. [trænz'mit] –	передавать
29. traffic , n. ['træfik] –	движение
30. wide area networks , n. [waɪd əəriə 'netwɜ:ks] –	всеобщая компьютерная сеть

Task I. Read text B “COMPUTER NETWORKS”

Computer networks link computers by communication lines and software protocols, allowing data to be exchanged rapidly and reliably. Traditionally, networks have been split between wide area networks (WANs) and local area networks (LANs). A WAN is a network connected over long distance telephone lines, and a LAN is a localized network usually in one building or a group of buildings close together. The distinction, however, is becoming blurred. It is now possible to connect up LANs remotely over telephone links so that they look as though they are a single LAN. Originally, networks were used to provide terminal access to another computer and to transfer files between computers. Today, networks carry e-mail, provide access to public databases and bulletin boards, and are beginning to be used for distributed systems. Networks also allow users in one locality to share expensive resources, such as printers and disk-systems.

Distributed computer systems are built using networked computers that co-operate to perform tasks. In this environment each part of the networked system does what it is best at. The high-quality bitmapped graphics screen of a personal computer or workstation provides a good user interface. The mainframe, on the other hand, can handle large numbers of queries and return the results to the users. In a distributed environment, a user might use his PC to make a query against a central database. The PC passes the query, written in a special language (e.g. Structured Query Language - SQL), to the mainframe, which then parses the query, returning to the user only the data requested. The user might then use his PC to draw graphs based on the data. By passing back to the user's PC only the specific information requested, network traffic is reduced. If the whole file were transmitted, the PC would then have to perform the query itself, reducing the efficiency of both network and PC.

The impact of fibre optics will be used to reduce considerably the price of network access. Global communication and computer networks will become more and more a part of professional and personal lives as the price of microcomputers and network access drops. At the same time, distributed computer networks should improve our work environments and technical abilities.

Task II. Learn the information about the Passive Voice.

To make passive verb forms we take the verb *to be* + *past participle*. We use a passive structure when it is not necessary to know who performs an action.

Examples: 1) Computer systems *are used* in different fields of human activity. - *Present Simple Passive*.

2) Originally, networks *were used* to provide terminal access to another computer and to transfer files between computers. - *Past Simple Passive*.

3) Computer networks *will be used* in XXI century. - *Future Simple Passive*.

4) Computers in offices *have been used* for a long time. - *Present Perfect Passive*.

Exercise 1. Use the verbs in brackets in the Present, Past or Future Simple Passive and Present Perfect Passive.

1. Originally, networks (to use) to provide terminal access to another computer and to transfer files between computers.
2. Thanks to computer networks new possibilities **(to provide)** to the user soon.
3. Computers (to use) widely nowadays.
4. Traditionally, networks (to split) between wide area networks (WANs) and local area networks (LANs).
5. Much progress (to make) recently in the field of computer technology.
6. Distributed computer systems (to build) using networked computers that co-operate to perform tasks.
7. Much information (to transmit) through computer networks.
8. The impact of fibre optics (to use) to reduce the price of network access.
9. Different tasks (to perform) using computer networks.
10. By passing back to the user's PC only the specific information requested, network traffic (to reduce).

Task III. Learn the information about modal verbs. Find the examples from the text.

We use modal verbs to say that something is possible or that somebody has the ability to do something (or general ability).

Examples: The user can use his PC to process data. / Possibility/.

Computer system could simplify our work. / Ability/.

Automation should improve people's life. / General ability/.

Exercise 2. Put the modal verbs - *can, could, should, might* -into the gaps.

1. The mainframe ... handle large numbers of queries and return the results to the users.

2. The user ... use his PC to draw graphs based on the data.
3. Distributed computer networks ... improve our work environments and technical abilities.
4. A user ... use his PC to make a query against a central database.
5. The PC ... perform the query itself.
6. First computers ... only perform simple operations.
7. Modern computer networks ... be used for many purposes.
8. A user ... be competent in processing data.
9. Modern PC's ... provide comfort and safety to the user.
10. LANs and WANs ... be used for many purposes.
11. Computer networks ... simplify our work.
12. Progress in the field of computer's technology ... improve people's life.

Task IV. Learn the information about Plural of Nouns:

Singular	Plural
1) network + s LAN + s computer + s	networks - (s) LANs - (z) computers - (z)
2) price + s database + s access + es	prices - (iz) databases (iz) accesses - (iz)
3) query + es ability + es	quer <u>i</u> es (iz) abilit <u>i</u> es (iz)
4) life + s shelf + es	li <u>v</u> es shel <u>v</u> es
5) <i>Special form:</i> tooth foot mouse etc.	teeth feet mice, etc

Exercise 3. Use singular or plural form of the underlined words:

1. Computer network link computer by communication line and software protocols.
2. Distributed computer system are built using networked computers that co-operate to perform task.

3. The computer passes the query, written in a special language to the mainframe
4. Traditionally, network have been split between WAN and LAN.
5. Today, network carry e-mail, provide access to public database and bulletin boards.
6. In a distributed environment, a user might use his PC to make a query against a central database.
7. Network also allow users in one locality to share expensive resource.
8. Global communication and computer network will become more and more a part of professional and personal life.
9. A LAN is a localized network usually in one building or a group of building close together.
10. The mainframe can handle large numbers of query and return the result to the users.

Exercise 4. Insert the necessary word.

1. Computer networks (link, connect, allow) computers by communication lines and software protocols, allowing data to be (reduced, exchanged, distributed) rapidly and reliably.
2. Computer networks (link, connect, allow) the user to exchange information.
3. A user can (link, connect, allow) other people by means of computer networks.
4. Today, networks (carry, transmit, improve) e-mail, provide access to public databases and bulletin boards, and are beginning to be used for distributed systems.
5. Thanks to computer networks you can (carry, transmit, improve) information from one computer to another.
6. Networks also allow users in one locality to (reduce, improve, share) expensive resources, such as printers and disk-systems.
7. Networks allow users to (reduce, improve, share) the price of communication.
8. Computer networks (reduce, improve, share) the quality of communication.
9. A user might use his PC to make (a query, a result, a mainframe) against a central database.
10. Low costs is one of the main (a query, a result, a mainframe) of the use of networks.

Task V. Match the words and their definitions.

- | | |
|---------------------------------|------------------------------|
| 1. Wide area networks | 3. Structured Query Language |
| 2. Distributed computer systems | 4. Computer networks |

5. Local area networks

- a) a network connected over long distance telephone lines.
- b) a localized network usually in one building or a group of buildings close together.

c) systems built using networked computers that co-operate to perform tasks.

d) a special language.

i) system linking computers by communication lines and software protocols, allowing data to be exchanged rapidly and reliably.

Task VI. What do the following abbreviations mean? Give their definition from the text.

- 1. PC
- 2. WANs
- 3. LANs
- 4. SQL
- 5. I/O

- 6. RAM
- 7. ROM
- 8. CD
- 9. CD R/W
- 10. DOS

Exercise 5. Do you agree or disagree with the following opinion? Give the correct variant. Use the given phrases:

Yes, I think so

I certainly agree with you

I am sure you are right

I don't think so

I doubt it

I disagree (with you)

- 1. Computer networks link computers by communication lines and software protocols, allowing data to be exchanged rapidly and reliably.
- 2. Today the distinction between wide area networks (WANs) and local area networks (LANs), however, is becoming blurred.
- 3. The impact of fibre optics will be considerable to elevate the price of network access.
- 4. By passing back to the user's PC only the specific information requested, network traffic is reduced.
- 5. The PC passes the query, written in an ordinary language.
- 6. A WAN is a localized network usually in one building or a group of buildings close together.
- 7. A LAN is a network connected over long distance telephone lines.
- 8. Today, networks carry e-mail, provide access to public databases and bulletin boards, and are beginning to be used for distributed systems.
- 9. Originally, networks were used to provide terminal access to another computer and to transfer files between computers.

10. The high-quality bitmapped graphics screen of a personal computer or workstation provides a bad user interface.
11. Global communication and computer networks will become more and more a part of professional and personal lives as the price of microcomputers and network access drops.
12. Distributed computer networks can not improve our work environments and technical abilities.

Exercise 6. Find in the text English equivalents for the following words and word combinations.

1. локальная компьютерная сеть; 2. запрос на специальном компьютерном языке; 3. всеобщая компьютерная сеть; 4. различие становится нечетким; 5. поднять стоимость сетевого доступа; 6. фиброволокно; 7. соединять компьютеры с помощью телефонных линий и протоколов программного обеспечения; 8. материнская плата; 9. база данных; 10. обмениваться информацией; 11. экран с графической разверткой; 12. обеспечить доступ сети.

Exercise 7. Using the information of the text, answer the questions given below.

1. What is the purpose of computer networks?
2. What is the traditional distinction between networks?
3. What is the definition of WANs?
4. What is the definition of LANs?
5. What are and were computer networks used for?
6. What do computer networks allow users?
7. Speak about distributed computer systems.
8. How can you make a query to a central database?
9. What language is the query written in?
10. What will reduce the price of network access?
11. What do you know about global communication?
12. What will distributed computer networks provide (improve)?

Task VII. Retell the text using the following key words and word combinations.

1. Computer Networks
2. Local area networks (LANs)
3. Wide area networks (WANs)
4. Distributed computer systems
5. A query
6. Global communication

Text C. How Computer Viruses Work Vocabulary

- | | |
|--|---------------------------------|
| 1. bulletin board system , n. (ˈbulitin bɔ:d sisˈtim) – | материнская плата |
| 2. commercial software , n. (kəˈmɜ:ʃəl ˈsɔftweə) – | коммерческое обеспечение |
| 3. computer virus , n. (kəmˈpjʊ:tə ˈvaɪrəs) – | компьютерный вирус |
| 4. detonator , n. [ˈdetoneɪtə] – | детонатор |
| 5. drive , n. [draɪv] – | передача, привод |
| 6. feature , n. [ˈfi:tʃə] – | черта |
| 7. floppy , n. [ˈflɒpi] – | дискета |
| 8. hard disc , n. [ˈhɑ:d disk] – | жесткий диск |
| 9. infector , n. [ɪnˈfektə] – | инфектор |
| 10. meanwhile , adv. [ˈmi:nˈwaɪl] – | между тем, тем временем |
| 11. to alter , v. [ˈɔ:lteɪ] – | изменять, переделывать |
| 12. to avoid , v. [əˈvɔɪd] – | избегать |
| 13. to be aware of , v. [əˈweə] – | знать, сознавать |
| 14. to boot , v. [bu:t] – | загружать, перезагружать |
| 15. to contain , v. [kənˈteɪn] – | включать в себя, содержать |
| 16. to damage , v. [ˈdæmɪdʒ] – | повреждать |
| 17. to enlarge , v. [ɪnˈlɑ:dʒ] – | расширять |
| 18. to erase , v. [ɪˈreɪz] – | стирать |
| 19. to install , v. [ɪnˈstɔ:l] – | устанавливать |
| 20. to interfere , v. [ɪntəˈfɪə] – | вмешиваться |
| 21. to notice , v. [ˈnəʊtɪs] – | замечать |
| 22. to replicate , v. [rɪˈplɪkeɪt] – | дублировать, повторять |
| 23. to run a program , v. [rʌn ə ˈprəʊgræm] – | запустить программу |
| 24. to separate , v. [ˈseprɪt] – | отличать, отделять |
| 25. to spread , v. [spred] – | распространяться |
| 26. to trigger , v. [ˈtrɪɡə] – | приводить в действие, запускать |
| 27. virus scanner , n. [ˈvaɪrəs ˈskænə] – | сканер [поиск] вирусов |
| 28. virus shield , n. [ˈvaɪrəs ʃi:ld] – | антивирусный заслон |
| 29. write-protect tabs , n. [raɪt -prəˈtekt tæbz] – | система защиты записи |

Task III. Read text C “How Computer Viruses Work”

1. A computer virus - an unwanted program that has entered your system without your knowing about it - has two parts, which I'll call the infector and the detonator. They have two very different jobs. One of the features of a computer virus that separates it from other kinds of computer program is that it replicates itself, so that it can spread (via floppies transported from computer to computer, or networks) to other computers.

2. After the infector has copied the virus elsewhere, the detonator performs the virus's main work. Generally, that work is either damaging data on your disks, altering what you see on your computer display, or doing something else that interferes with the normal use of your computer. Here's an example of a simple virus, the Lehigh virus. The infector portion of Lehigh replicates by attaching a copy of itself to COMMAND.COM (an important part of DOS), enlarging it by about 1000 bytes.

3. So let's say you put a floppy containing COMMAND.COM into an infected PC at your office -that is, a PC that is running the Lehigh program. The infector portion of Lehigh looks over DOS's shoulder, monitoring all floppy accesses. The first time you tell the infected PC to access your floppy drive, the Lehigh infector notices the copy of COMMAND.COM on the floppy and adds a copy of itself to that file.

Then you take the floppy home to your PC and boot from the floppy. (In this case, you've got to boot from the floppy in order for the virus to take effect, since you may have many copies of COMMAND.COM on your hard and floppy disks, but DOS only uses the COMMAND.COM on the boot drive.)

Now the virus has silently and instantly been installed in your PC's memory. Every time you access a hard disk subdirectory or a floppy disk containing COMMAND.COM, the virus sees that file and infects it, in the hope that this particular COMMAND.COM will be used on a boot disk on some computer someday.

Meanwhile, Lehigh keeps a count of infections. Once it has infected four copies of COMMAND.COM, the detonator is triggered. The detonator in Lehigh is a simple one. It erases a vital part of your hard disk, making the files on that part of the disk no longer accessible. You grumble and set about rebuilding your work, unaware that Lehigh is waiting to infect other unsuspecting computers if you boot from one of those four infected floppies.

4. Don't worry too much about viruses. You may never see one. There are just a few ways to become infected that you should be aware of. The sources seem to be service people, pirated games, putting floppies in publicly available PCs without write-protect tabs, commercial software (rarely), and software distributed over computer bulletin board systems (also quite rarely, despite media misinformation).

Many viruses have spread through pirated - illegally copied or broken - games. This is easy to avoid. Pay for your games, fair and square. . If you use a shared PC or a PC that has public access, such as one in a college PC lab or a library, be very careful about putting floppies into that PC's drives without a write-protect tab. Carry a virus-checking program and scan the PC before letting it write data onto floppies.

5. Despite the low incidence of actual viruses, it can't hurt to run a virus checking program now and then. There are actually two kinds of antivirus

programs: virus shields, which detect viruses as they are infecting your PC, and virus scanners, which detect viruses once they've infected you.

6. Viruses are something to worry about, but not a lot. A little common sense and the occasional virus scan will keep you virus-free.

Remember these four points:

- viruses can't infect a data or text file.
- before running an antivirus program, be sure to cold-boot from a write-protected floppy.
- don't boot from floppies except reliable DOS disks or your original production disks.
- stay away from pirated software.

Exercise 1. Find the English equivalents to the following word combinations in the text.

- 1) нежелательные программы;
- 2) запустить антивирусную программу;
- 3) повредить информацию на диске;
- 4) вмешиваться в нормальную работу компьютера;
- 5) обращать внимание на;
- 6) распространяться по компьютерной сети;
- 7) вставить дискету;
- 8) вирусы, размещенные в памяти компьютера;
- 9) «пиратские» диски;
- 10) стирать информацию с жесткого диска;
- 11) коммерческое обеспечение;
- 12) система защиты записи.

Task II. *Skimming* means reading quickly, without reading every word, in order to get the main idea.

Skim through the text and write in the number of the paragraph that deals with each of the following topics:

- механизм действия инфектора и детонатора
- 2 типа антивирусных программ
- пути распространения вирусов
- определение компьютерного вируса
- пример распространения вируса с дискеты
- способы предохранения от компьютерных вирусов

Task III. *Scanning* means looking over a reading for specific information.

Scan the text to find information on the following aspects:

1. Computer viruses: definition, structure;
2. Mechanism of functioning of an infector;
3. Mechanism of functioning of a detonator;
4. Ways of virus's spreading;
5. A virus-checking program: 2 types;
6. Points to be aware of to avoid viruses.

Exercise 2. Choose the topic sentence of each paragraph.

1. A computer virus is an unwanted program that has entered your system without your knowing about it.
2. _____
3. _____
4. _____
5. _____
6. _____

Exercise 3. Write down the key word combinations from each paragraph of the text.

Example: Paragraph 1: computer virus – unwanted program – 2 parts: the infector + the detonator.

Exercise 4. Find the definitions of the following terms in the text.

- 1) virus shields;
- 2) computer virus;
- 3) the infector;
- 4) the detonator;
- 5) pirated games.

Exercise 5. Match the sentence beginnings with the correct endings.

- | | |
|--|--|
| 1. There are actually two kinds of antivirus programs: ... | 7. Many viruses have spread through ... |
| 2. One of the features of a computer virus ... | a) virus shields and virus scanners. |
| 3. Virus shields ... | b) detect viruses as they are infecting your PC. |
| 4. Despite the low incidence of actual viruses, ... | c) detect viruses once they've infected you. |
| 5. Virus scanners ... | d) pirated games. |
| 6. After the infector has copied the virus elsewhere, ... | i) the detonator performs the virus's main work. |

- f) it can't hurt to run a virus checking program.
- g) is that it replicates itself.

Exercise 6. Agree or disagree with the following statement. Write an essay to support your opinion (5-7 sentences).

Don't worry too much about viruses. You may never see one. There are just a few ways to become infected.

Task IV. Learn the information about the Infinitives.

1) Infinitives are used after certain adjectives: <i>Example:</i> It's important <u>to know</u> about viruses. It isn't difficult <u>to avoid</u> computer viruses.
2) Infinitives are used to express purpose. (They answer the question Why?) <i>Example:</i> I'm learning English <u>to get</u> a good job. She's going to the USA <u>to visit</u> her parents.

Exercise 7. Link the following sentences using the Infinitive after adjectives or the Infinitive of purpose and translate them into Russian.

Model: 1) I met my mother at the University. I'm surprised. –
I'm really surprised to meet her at the University.
2) He learns Chinese. He wants to visit China. –
He learns Chinese to visit China.

1. I met my friend at the office. I'm really surprised.
2. I learn English. I want to have a good job.
3. My sister saves money. She's going to buy a new car.
4. Computers are widely used nowadays. They perform different tasks.
5. I saw my group-mates after summer holidays. I'm very pleased.
6. He entered the Voronezh State University of Architecture and Construction this year. He wants to get a good profession.
7. People invented computers. They make our life easier.
8. I study computer's technology. It's very important nowadays.
9. PCs are very important in our professional and personal lives. They improve work and living conditions.
10. You shouldn't use broken software and pirated games. It's dangerous for your PC.

Exercise 8. Read aloud the following numbers and put them into the phrases.

Model: I was born in 1980.
In 1997 I finished school.
In 2010 I'll get a certificate of higher education, I hope.

The storage medium of a computer contains about 80,000 Gb.

- a) 1998; 2001; 2010; 1976; 1878; 2000; 1953; 2003;
- b) 100,000 bytes; 54, 900 Mb; 100 bits; 831,253,000 bytes; 7,74 Gb; 11,7Gb; 19,5 Gb.

Task V. Read the summary of Text C. Write your own variant of the summary and compare both variants.

Summary is a short account giving the main points. *Summarizing* means taking only the most important ideas and information from reading and putting them in your own words.

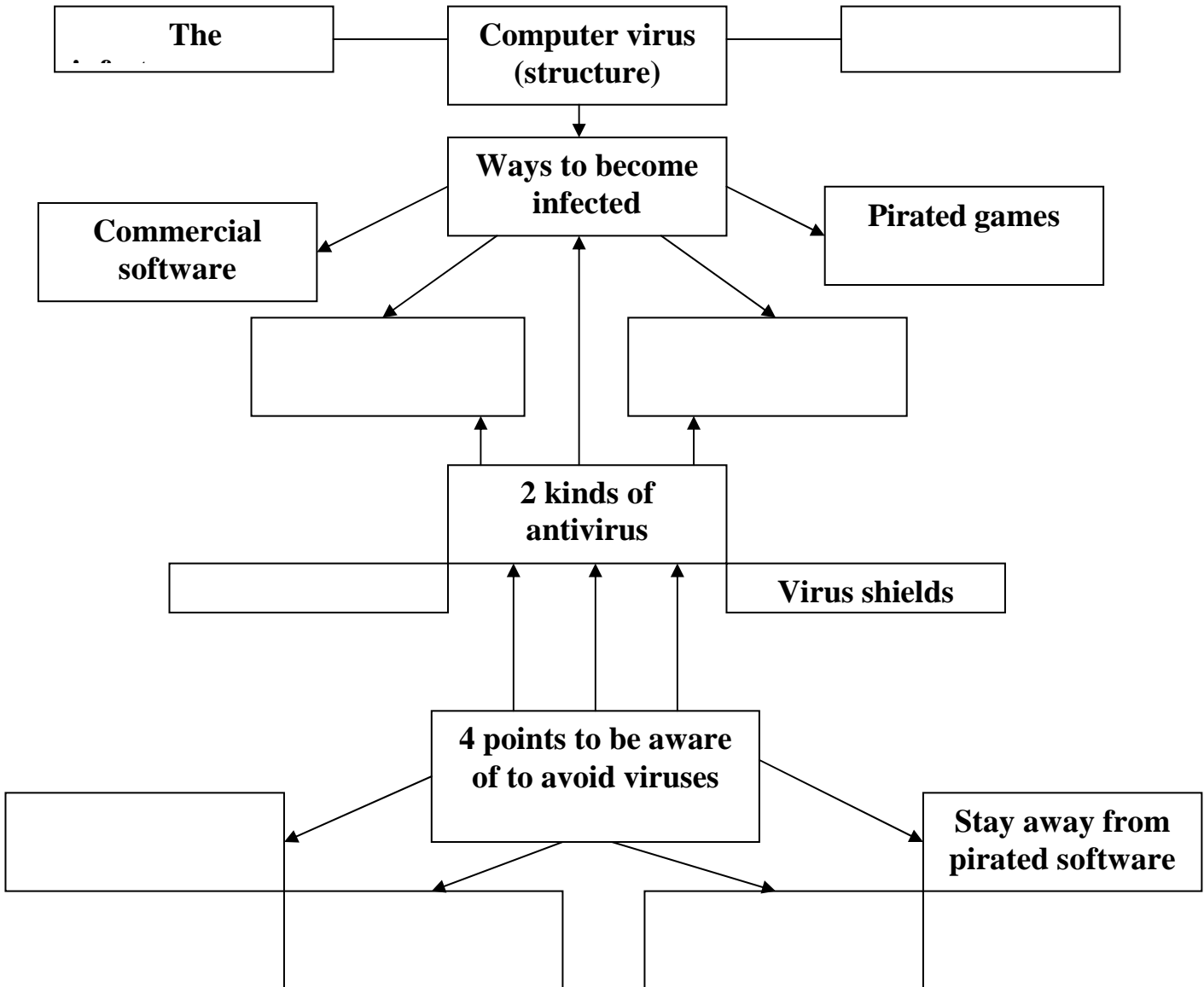
(**Аннотация** - это предельно краткое изложение текста, дающее представление о его тематике.)

Example: The text deals with the problem of computer viruses. The author pretends that a computer virus is an unwanted program which consists of an infector and a detonator.

After the infector has copied the virus elsewhere, the detonator performs the virus's main work: damaging data on your disks, altering what you see on your computer display, or doing something else that interferes with the normal use of the computer. Many viruses have spread through pirated games, putting floppies in publicly available PCs without write-protect tabs, commercial software (rarely), and software distributed over computer bulletin board systems .

There are two kinds of antivirus programs: virus shields, which detect viruses as they are infecting your PC, and virus scanners, which detect viruses once they've infected you.

Task VI. Build up the scheme of the classification of computer viruses.



Task VII. Using the scheme speak about computer viruses and antivirus programs. Express your opinion on the topic using the following expressions:

- *I think ...*
- *As for me, I think...*
- *To my mind ...*
- *In my opinion ...*
- *As far as I know ...*
- *I dare say that ...*
- *I'm quite sure that...*
- *I'm persuaded that...*
- *I insist on the fact that...*
- *As for me, I find this problem important / actual / difficult ...*

Texts for Self-Study and Analysis
Automation of Technological Process and Production

Text 1

From the History of PC Industry

In 1952, a major computing company took a decision to get out of the business of making mainframe Computers. They believed that there was only a market for four mainframes in the whole world. That company was IBM. The following year they reversed their decision.

In 1980, IBM decided that there was a market for 250,000 PCs, so they set up a special team to develop the first IBM PC. It went on sale in 1981 and set a world-wide standard for IBM-compatibility which, over the next ten years, was only seriously challenged by one other company, Apple Computers. Since then, over seventy million PCs made by IBM and other manufacturers have been sold. Over this period, PCs have become commodity items. Since IBM made the design non-proprietary, anyone can make them.

The history of the multi-billion dollar PC industry has been one of mistakes. Xerox Corporation funded the initial research on personal computers in their Palo Alto laboratory in California. However, the company failed to capitalize on this work, and the ideas that they put together went into the operating system developed for Apple's computers. This was a graphical interface: using a mouse, the user clicks on icons which represent the function to be performed.

The first IBM PC was developed using existing available electrical components. With IBM's badge on the box it became the standard machine for large corporations to purchase. When IBM were looking for an operating system, they went initially to Digital Research, who were market leaders in command-based operating systems (these are operating systems in which the users type in commands to perform a function). When the collaboration between IBM and Digital Research failed, IBM turned to Bill Gates, then 25 years old, to write their operating system.

Bill Gates founded Microsoft on the basis of the development of MS/DOS, the initial operating system for the IBM PC. Digital Research have continued to develop their operating system, DR/DOS, and it is considered by many people to be a better product than Microsoft's.

However, without an endorsement from IBM, it has become a minor player in the market. Novell, the leaders in PC networking, now own Digital Research, so things may change.

The original IBM PC had a minimum of 16K of memory, but this could be upgraded to 512K if necessary, and ran with a processor speed of 4.77MHz. Ten years later, in 1991, IBM were making PCs with 6Mb of memory, expandable to 64Mb, running with a processor speed of 33MHz. The cost of buying the hardware has come down considerably as the machines have become commodity items.

Large companies are considering running major applications on PCs, something which, ten years ago, no one would have believed possible of a PC. In contrast, many computers in people's homes are just used to play computer games.

The widespread availability of computers has in all probability changed the world for ever. The microchip technology which made the PC possible has put chips not only into computers, but also into washing-machines and cars. Some books may never be published in paper form, but may only be made available as part of public databases. Networks of computers are already being used to make information available on a world-wide scale

Text 2

Automation: a Must for Industrial Survival

(Part I)

The seventies and eighties have been devastating for U.S. manufacturing. Industry after industry has come under attack from foreign competition. Many have been decimated. Imports are up, exports down, and market share held by America's manufacturers has fallen in both U.S. and world markets.

Commenting on the state of American industry, Akio Morita, CEO of Sony, said in *The Japan That Can Say No*, "Americans today make money by handling money and shuffling it around, instead of creating and producing goods with some actual value. The time will never again come when America will regain its strength in industry."

Is Morita correct in his provocative assessment of American industry? Or, are America's manufacturers a sleeping giant? Can we overtake the Pacific Rim and European manufacturers in product value? Can we match them in product quality, functionality, creativeness, styling, and cost?

Clearly, the potential exists for a resurgence of U.S. manufacturing. America remains the leader in innovation and technology development. America has the largest pool of trained scientists and engineers in the world—some 4.5 million. Our \$15-billion-a-year investment in basic research is far greater than any other nation. And even though our lead in manufacturing productivity has narrowed as Japan's and West Germany's companies increase productivity, we remain the leader.

Further, American universities remain as the world's best. However, manufacturing technology needs a more prominent role in university curriculum so our best and brightest students will believe manufacturing offers as rewarding a career as law and finance.

Text 3***Automation: a Must for Industrial Survival*****(Part II)**

In every industry superior U.S. technology has been available, but it has not been implemented. Our problems typically have been management problems, not technology problems. American management has too often been complacent, or failed to grasp the significance of automation on future competitiveness and profitability. Management has frequently stood idly by as market share disintegrated. Automation must become accepted by senior management as being strategic—a competitive weapon whose implementation will have a long-term positive impact on the business.

For automation to be effective, data integration must occur. Organizational and technological barriers among functions need to be brought down and islands of automation bridged.

A dominant thrust of design and factory automation will be to fully integrate functions from the conceptual design stage to final assembly and test. The geometry used to create the product model in the conceptual design phase must not only be used to provide photo-realistic product images for visualization purposes, but it must be directly usable in all downstream engineering and manufacturing functions. The design must be created once, and that model must then serve as the basis for all remaining applications.

We need to see integration of the industrial design system with mainstream CAD/CAM software systems to provide a direct coupling with detailed design and documentation systems. Various computer analytical functions should directly use design data. These functions include structural, fluid flow, heat transfer, kinematics, and simulation.

Output from engineering should feed the manufacturer's bill of material, MRP, costing, process planning, and quality-control systems. NC programming codes should directly use the surfaces produced in conceptual design when generating cutter paths for machining. Flat pattern layout will be an extension of the industrial or conceptual design system.

We need a network-based transparent computing architecture. Users at a PC or workstation should have direct access to all computing resources and relevant data within the network. Moreover, the users should have the freedom to select the most appropriate application for the task. This implies a potential mix and match of multiple application vendors. Incorporation of accepted industry standards into the environment should be enforced.

Knowledge-based systems and neural networks will be integral components of factory-automation systems. In knowledge-based systems, engineering and manufacturing knowledge is captured and then made available in the form of rules, relationships, and constraints. In the neural-network approach, the net learns the

correlation between input examples and the expected outcome. It then generalizes the relationship and generates outputs in response to new inputs.

In an automation system as described, the product-development cycle could be dramatically reduced. A manufacturer could get much closer to the market window before making product-design and acceptance decisions or ordering raw materials. A higher-quality product results, and that means less rework, less rejects, fewer close-outs, less raw material, greater inventory turns, and increased customer satisfaction.

So the issues to be solved are related to management and effective implementation of existing technology. For U.S. industry to survive the increasing pressure of foreign competition, implementation of design and factory automation is mandatory. And effective automation implementation requires data integration, management of the data, and using appropriate automation tools.

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Unit V

Architecture and the Architect

Speciality:	Industrial and Civil Engineering
Grammar:	Passive Voice, Simple Tenses, Suffixes, Prepositions, The comparative and Superlative Degrees of Adjectives and Adverbs

Architecture is the art and science of designing and building structures, or ensembles according to aesthetic and functional criteria. Structures built in accordance with such principles are also architecture.

The architect is a person trained and experienced in the design of buildings and the coordination and supervision of all aspects of the construction of buildings.

When the architect designs a structure, he uses the cumulative knowledge of centuries. Working to the architect's design are many consultant experts – structural engineers, services engineers and other sub-contracted specialists.

The architect's functions now extend into town planning and work activities that need buildings.

Town planning or urbanism is the preparation of plans for the regulated growth and improvement of towns, or the organization of land buildings for group living. It is a cooperative process in which architects, economists, engineers, lawyers, landscape architects, surveyors or topographers and other specialists take part.

According to the International Union of Architects (UIA), at present there are over 800,000 fully qualified architects in the world.

The architect's sphere of knowledge is constantly expanding. He has to combine art, advanced technology, science, and economics in his work.

The main problem facing the architect today is to avoid any conflict with nature and the landmarks of by-gone days.

Text A “Architectural Planning”.

Vocabulary:

1. hindrance, n – ['hIndr(ə)ns]	помеха, препятствие;
2. to repel, v – [rɪ 'pel]	отражать;
3. moisture, n – ['mɔɪsCə]	влажность;
4. to foresee, v – [fl 'sɜ]	предвидеть;
5. earthquake, n – ['WtkeIk]	землетрясение;
6. flood, n – [flAd]	наводнение;
7. arrangement, n – [ə'reInGmənt]	распределение;
8. axis, n – ['ksɪs]	ось;
9. device, n – [dɪ 'vɪs]	средство;
10. disadvantage, n – ['dɪsqd 'vRntɪG]	недостаток;
11. to influence, v – ['ɪnfluəns]	влиять;
12. to modify, v – ['mɒdɪfɪ]	видоизменять;
13. to withstand, v – [wɪd'stænd]	противостоять;
14. mold, n – [mɒld]	(зд.).плесень;
15. resistance, n – [rɪ 'zɪst(ə)ns]	сопротивление;
16. extreme, n – [ɪks 'trɪm]	крайняя степень;
17. to penetrate, v – ['penɪtreɪt]	проникать;
18. patron, n – ['peɪtr(ə)n]	клиент, заказчик;
19. sacristy, n – ['sækrɪstɪ]	ризница;
20. ambulatory, n – ['æmbjʊlətɔrɪ]	крытая внутренняя галерея;
21. commodity, n – [kə'mɒdɪtɪ]	предметы потребления;
22. scarce, a – ['skærs]	скудный;
23. abundant, a – [ə'bʌndənt]	обильный;
24. otherwise, adv – ['ADqwɔɪz]	в противном случае.

Task 1. Read text A “Architectural Planning”.

5.1 Text A: “Architectural Planning”.

The architect usually begins to work when the site type and cost of a building have been determined.

Planning the environment. The natural environment is at once a hindrance and a help, and the architect seeks both to invite its aid and to repel its attack. To make buildings habitable and comfortable, he must control the effects of heat, cold, light, air,

moisture, and dryness and foresee destructive potentialities such as fire, earthquake, flood.

The placement and form of buildings in relation to their sites, the distribution of spaces within buildings, and other planning devices discussed below are fundamental elements in the aesthetics of architecture.

Orientation. The arrangement of the axes of buildings and their parts is a device for controlling the effects of sun, wind, and rainfall.

Within buildings, the axis and placement of each space determine the amount of sun it receives. Orientation may control air for circulation and reduce the disadvantages of wind, rain, and snow.

The characteristics of the immediate environment also influence orientation: trees, land formation, and other buildings create shade and reduce or intensify wind, while bodies of water produce moisture and reflect the sun.

Architectural forms. Planning may control the environment by the design of architectural forms that may modify the effects of natural forces.

Color. Color has a practical planning function as well as an expressive quality because of the range of its reflection and its absorption of solar rays. Since light colors reflect heat and dark colors absorb it, the choice of materials and pigments is an effective tool of environmental control.

Materials and techniques. The choice of materials is conditioned by their own ability to withstand the environment as well as by properties that make them useful to human beings. One of the architect's jobs is to find a successful solution to both conditions; to balance the physical and economic advantages of wood against the possibility of fire, termites, and mold, the weather resistance of glass and light metals against their high thermal conductivity, and many similar conflicts.

Interior control. The control of the environment through the design of the plan and the outer shell of a building can't be complete, since extremes of heat and cold, light, and sounds penetrate into the interior, where they can be further modified by the planning of spaces and by special conditioning devices.

Temperature, light and sound are all subject to control by the size and shape of interior spaces, the way in which the spaces are connected, and the materials employed for floors, walls, ceilings, and furnishings.

Today, heating, insulation, air conditioning, lighting, and acoustical methods have become basic parts of the architectural program.

Differentiation. The number of functions requiring distinct kinds of space within a building depends not only upon the type of building but also upon the requirements of the culture and the habits and activities of the individual patrons. A primitive house has a single room with a hearth area, and modern one has a separate areas for cooking, eating, sleeping, washing, storage, recreation.

Economic planning. Major expenses in building are land, materials, and labor. In each case they are high when the commodity is scarce and low when it is abundant, and they influence planning more directly when they become restrictive.

When land coverage is limited, it is usually necessary to design in height the space that otherwise would be planned in breadth and depth, as in the ancient Roman insula (apartment houses) or the modern skyscraper. When the choice of materials is influenced by cost, all phases of architectural design are affected, since the planning procedure, the technique, and the form of buildings are dependent on materials. High labor cost influence the choice of techniques and, consequently, of materials.

Exercise 1. Choose the right word.

1. The placement and form of buildings in relation to their ... is one of the fundamental elements in the aesthetics of architecture.
a) square b) comfort c) sites
2. The arrangement of the ... of buildings and their parts controls the effects of sun, wind, and rainfall.
a) rooms b) axes c) spaces
3. The characteristics of the immediate ... also influence orientation.
a) environment b) territory c) building
4. Color has practical planning ... and expressive quality.
a) choice b) feature c) function
5. Planning for use is concerned with convenience of ... and rest.
a) movement b) parts c) requirements
6. Major expenses in building are for ... , materials, and labor.
a) habits b) land c) phase

Exercise 2. Match the words from two columns.

- | | |
|-----------------|------------------|
| 1. hindrance | a. ВИДОИЗМЕНЯТЬ |
| 2. to withstand | b. ось |
| 3. patron | c. ПРОТИВОСТОЯТЬ |
| 4. disadvantage | d. ВЛИЯТЬ |
| 5. modify | e. ПОМЕХА |
| 6. to influence | f. ЗАКАЗЧИК |
| 7. axis | g. НЕДОСТАТОК |

Exercise 3. Put the verbs in brackets in the correct tense.

1. The architect usually ... (begin) to work when the site type and cost of a building have been determined.
2. The natural environment is at once a hindrance and a help, and the architect ... (seek) both to invite its aid and to repel its attack.
3. Orientation may ... (control) air for circulation and reduce the disadvantages of wind, rain, and snow.
4. The choice of materials ... (be) conditioned by their own ability to

withstand the environment as well as by properties that make them useful to human beings. **5.** Temperature, light and sound ... (be) all subject to control by the size and shape of interior spaces, the way in which the spaces are connected, and the materials employed for floors, walls, ceilings, and furnishings. **6.** Major expenses in building ... (be) land, materials, and labor.

Exercise 4. Give the English equivalents.

Отразить атаку; пригодный для жилья; расположение; положение; результаты воздействия солнца, ветра и дождя; создавать влажность и отражать солнце; важное (эффективное) средство контроля; выбор материалов для строительства; способность противостоять воздействиям окружающей среды; отопление, изоляция, кондиционирование воздуха, освещение, акустические методы; функциональное планирование; расходы; влиять на выбор материалов; зависеть от требований заказчика.

Exercise 5. Answer the questions.

1. When does the architect begin to work on the project?
2. What are the main aspects of architectural planning?
3. What are the fundamental elements in the aesthetics of architecture?
4. What must the architect control to make buildings habitable and comfortable?
5. What is the planning for use concerned with?
6. What are the major expenses in building?

Exercise 6. Form nouns, verbs, adjectives adding suffixes and translate them into Russian:

- a) –**ment**: to develop, to improve, to achieve, to move, to govern;
–**ship**: student, member, partner, author, leader, professor;
- b) –**ize**: real, organ, special, harmony, style, modern;
–**ate**: decor, operation, illumination, domination, location;
–**al**: form, person, profession, function, architecture,;
–**ive**: progress, mass, construct, create.

Exercise 7. Translate the following words and compare the difference in their meanings:

May, may, my; and, end; no, know; to, too, two; then, than; must, mast; not, note; principal, principle; since, science; this, these, thus; trend, trained; on, one.

Text B “Orders of Architecture”.

Vocabulary

1. **replacement**, n – [rɪ'pleɪsmənt] замена

2. pillar, n – ['pɪlɹ]	столб, колонна, опора
3. carpentry	плотничное дело
4. order	ордер
5. entablature	антаблемент
6. Doric order	дорический ордер
7. Ionic order	ионический ордер
8. Corinthian order	коринфский ордер
9. Tuscan order	тосканский ордер
10. Composite order	композиционный, сложный ордер
11. eventually, adv – [I'vent juqlI]	в конце концов
12. arrangement, n – [q'reInGmɔnt]	расположение
13. to define, v – [dI'faIn]	определять
14. pattern, n – ['pɛtɹn]	модель, образец
15. capital	капитель
16. frieze	фриз
17. shell, n – [Sel]	оболочка, каркас
18. spreading – [spredIN]	распространяющийся
19. to evolve, v – [I'vɒlv]	развиваться
20. intimation, n – ["Inti'meIS(q)n]	указание, сообщение, намек
21. elaborately – [I'lxɒ(q)rItlI]	тщательно (разрабатывать)
22. to carve, v – ['kɹv]	резать, вырезать
23. hoop, n – [hɒp]	обруч
24. volute	волута; завиток (архитектурная особенность ионического стиля)
25. fussy, a – ['fAsI]	вычурный
26. to exceed, v – [Ik'sJd]	превышать, превосходить
27. successive	последующий, следующий
28. acanthus	акант (орнамент)
29. corner, n – ['kɒnɹ]	угол
30. cornice	карниз; свес
31. mutules	мутулы, модильоны дорического ордена

Task II. Read text B “Orders of Architecture”.

5.2 Text B: “Orders of Architecture”.

The first step in architecture was simply the replacement of wooden pillars with stone ones, and the translation of the carpentry and brick structural forms into stone equivalents. This provided an opportunity for the expression of proportion and pattern. This expression eventually took the form of the invention or evolution of the stone “orders” of architecture. These orders, or arrangements of specific types of columns supporting an upper section called an entablature, defined the pattern of the columnar facades and upper works that formed the basic decorative shell of building.

The Greeks invented the Doric, Ionic, and Corinthian orders. The Romans added the Tuscan and the Composite.

The oldest order, the Doric, is subdivided into Greek Doric and Roman Doric. The first is the simplest and has baseless columns as those of the Parthenon. Roman Doric has a base and is less massive.

The parts of Greek Doric – the simplest, baseless columns, the spreading capitals, and frieze above the columns – constitute an aesthetic development in stone incorporating variants on themes used functionally in earlier wood and brick construction. Doric long remained the favourite order of the Greek mainland and western colonies, and it changed little throughout its history.

The Ionic order evolved later, in eastern Greece. About 600 BC, in Asia Minor, the first intimation of the style appeared in stone columns with capitals elaborately carved in floral hoops – an Orientalizing pattern familiar mainly on smaller objects and furniture and enlarged for architecture.

It developed throughout so called Aeolic capital with vertically springing volutes or spiral ornaments to the familiar ionic capital, the volutes of which spread horizontally from the centre and curl downward. The order was always fussier and more ornate, less stereotyped than Doric. The Ionic temples of the 6th century exceed in size and decoration even the most ambitious of their Classical successors. Such were the temples of Artemis at Ephesus in Asia Minor and the successive temples of Hera on the island of Samos.

The Corinthian order originated in the 5th century BC in Athens. It had Ionic capital elaborated with acanthus leaves. In its general proportions it is very like the Ionic. For the first time the Corinthian order was used for temple exteriors. Because of its advantage of facing equally in four directions it was more adaptable than Ionic for corners. There are not many Greek examples of the Corinthian order. The Romans widely used it for its showiness. The earliest known instance of the Corinthian order used on the exterior is the choragic monument of Lysicrates in Athens, 335/334 BC.

A simplified version of the Roman Doric is the Tuscan order. It has a less decorated frieze and no mutules in the cornice.

The Composite order is also a late Roman invention. It combines the elements from all the Greek orders.

Task III. Read the definitions of the following words and word combinations and memorize them.

order – ордер архитектурный, определённое сочетание несущих и несомых частей стоечно-балочной конструкции, их структура и художественная обработка.

Doric order – дорический ордер, один из трёх основных архитектурных ордоров. Колонна д. о. не имеет базы; ствол прорезан каннелюрами.

Ionic order – ионический ордер, один из трёх основных архитектурных ордоров, имеет стройную колонну с базой, стволом, прорезанными вертикальными желобками.

Corinthian order – коринфский ордер, один из трёх основных архитектурных ордоров. Имеет высокую колонну с базой, стволом, прорезанными желобками и пышной капителью, состоящей из рядов листьев аканфа и небольших волют.

frieze – в архитектурных ордерах средняя горизонтальная часть антаблемента.

capital – венчающая часть колонны, столба или пилястры.

Exercise 1. Form the comparative and superlative degrees from the following adjectives and adverbs:

Large, big, far, early, new, much, simple, good, small, little, easy, high, many, low, well, wide, badly, durable, massive, old, elegant, notable, outstanding.

Exercise 2. Choose the correct word from the two words given in brackets.

1. The Greeks ... (invented; placed) the Doric, Ionic, and Corinthian orders. 2. The ... (oldest; youngest) order, the Doric, is subdivided into Greek Doric and Roman Doric. 3. Roman Doric ... (have; has) a base and is less massive. 4. For the first time the Corinthian order was used for ... (theatres; temples). 5. The Ionic was always fussier than ... (the Doric; the Tuscan).

Exercise 3. Choose the right term.

1. The upper section of a classical order is a/an
a) volute b) entablature c) base
2. Spiral ornaments are called ...
a) capitals b) mutules c) volutes
- 3) The part of the column is
a) frieze b) capital c) cornice
- 4) A particular style of column with its entablature having standardized details is
a) façade b) colonnade c) order

Exercise 4. Match the words and their definitions.

- | | |
|----------------|------------------------------------|
| 1. Step | ~ a model for use in making things |
| 2. Pattern | ~ a stage in a process |
| 3. Arrangement | ~ to develop gradually |

- | | |
|--------------|------------------------------------|
| 4. Subdivide | ~ putting in a specific order |
| 5. Invention | ~ to divide into smaller parts |
| 6. Evolve | ~ a new method, process, or device |

Exercise 5. Find the sentences in the Present Simple and Past Simple Tenses in the text.

Exercise 6. Fill in the gaps.

1. The Greeks ... (invent) the Doric, Ionic, and Corinthian orders. 2. The Romans ... (add) the Tuscan and the Composite. 3. The oldest order, the Doric, ... (be) subdivided into Greek Doric and Roman Doric. 4. Roman Doric has a base and ... (be) less massive. 5. The Ionic order ... (evolve) later, in eastern Greece. 6. There ... (be) not many Greek examples of the Corinthian order. 7. A simplified version of the Roman Doric ... (be) the Tuscan order.

Exercise 7. True or false.

- a) the first step in architecture was simply the replacement of wooden pillars with stone ones.
- b) the Greeks invented Tuscan and Composite orders.
- c) the oldest order, the Doric, is subdivided into Greek Doric and Roman Doric.
- d) Roman Doric has no base.
- e) the Ionic order was evolved later, in eastern Greece.

Exercise 8. Using the information of the text, characterize:

- term order
- orders of architecture

Exercise 9. How many differences between Doric and Ionic orders can you find in the text? Fill in the table using the characteristics of the both.

Doric order

1. The oldest order
- 2.
- 3.
- 4.

Ionic order

1. Evolved later
- 2.
- 3.
- 4.

Exercise 10. Speak about orders of architecture using key words and word combinations.

1. Term order.
2. Orders in classical architecture.
3. Orders invented by the Greeks.
4. Difference between Greek Doric and Roman Doric.

Exercise 11. Form the Comparative and Superlative degrees from the following adjectives and adverbs:

Large, big, far, early, new, much, simple, good, small, little, easy, high, many, low, well, wide, badly, durable, massive, old, elegant, notable, outstanding.

Text C. “Bauhaus”.

Vocabulary

1. craft, n – [krRft]	ремесло
2. gap, n – [gxp]	расхождение
3. launch, v – [lLnC]	запускать
4. scale, n – [skeIl]	масштаб
5. preliminary, a – [prI 'lImInqrI]	подготовительный
6. ceramics, n – [sI 'rxmIks]	керамика
7. carpentry, n – ['kRpIntrI]	плотничное дело
8. weaving, n – ['wJvIN]	плетение
9. tool, n – [tHl]	инструмент
10. apprentice, n – [q'prentIs]	ученик
11. distinguish, a – [dIs 'tINGwIS]	выдающийся
12. heirloom, n – ['FqlHm]	наследство
13. linen, n – ['lInIn]	бельё
14. rift, n – [rIfIt]	трещина
15. to isolate, v – ['aIsqleIt]	изолировать
16. dyeing, n – ['daIN]	окраска
17. jut, v – [GAt]	выступать
18. skeleton, n – ['skelItn]	каркас
19. abrupt, a – [q'brApt]	обрывистый
20. juxtapose, v – ['GAKstqpoz]	размещать рядом
21. cantilever, n – ['kxntIlJvq]	консоль
22. humility, n – [hjH 'mIlItI]	смирность
23. slab, n – [slxb]	плита
24. concrete, n – ['kOnkrJt]	бетон

Task IV. Read text C “Bauhaus”.

5.3 Text C: “Bauhaus”.

Walter Gropius is one of the outstanding architects and teachers of the 20th century. His idea was to combine the school of art crafts under the name of the Bauhaus or “House Of Building”.

At the Bauhaus (Weimar), Gropius hoped to find a way to bridge the gap between the arts and also to unite art and industrial products. Although Gropius was a born teacher and organizer, it was not easy to launch a school with young men who differed widely in age and abilities.

All students were accepted for a training period. All took a six-month preliminary course. In this course Gropius introduced students to proportion, scale and colour, and to machines and materials used in mass production.

After completion of a preliminary course the student could join a workshop of his own choice – ceramics, carpentry, furniture design, metals, weaving or painting. The aim was not only to teach students to use hands but to guide them to an understanding of the tools of the machine age. Gropius, who designed everything from teaspoons to automobile bodies, encouraged students in the direction of fresh honest ideas. He didn't want students to imitate or become small editions of himself.

After a training period in handwork and design, students had to submit to an examination by masters of the Bauhaus and by Chamber of Handicrafts. If they passed this they received a diploma and became trade apprentices. They earn a Master's diploma they had to undergo a period of training in actual building.

Gropius had assembled one of the most distinguished faculties ever housed under one roof, but the work of his staff excited abuse because it was modern. Rumours and false accusations made it difficult to get the funds needed for the state-supported school. To tide the Bauhaus over one financial crisis, Gropius sold a valuable family heirloom – linen and table service that had belonged to Napoleon. But all was in vain, the school was to be closed.

Students begged Gropius to reopen the school elsewhere. After newspapers headlined the rift between him and the government offers came from four cities to make funds available for a bigger, better Bauhaus.

Gropius chose Dessau, a factory town some sixty miles from Berlin. He was attracted by the beautiful natural surroundings and by the attitude of the courageous, energetic mayor who guaranteed a site and building funds.

Most of the former students moved to Dessau in the spring of 1925 to begin building activity.

The building program for the new school at Dessau had to meet many different requirements :

- 1) the Bauhaus, the school of Design itself;
- 2) the school of the city of Dessau for continuation courses in the trades;

- 3) studio and dwelling quarters for students;
- 4) a private studio for Gropius himself.

The architect's chief aim was to produce a clear separation of each of these functions isolating them but bringing them together into efficient interrelation.

The chief accents fell on the Bauhaus the nucleus of the whole school. The Bauhaus combined laboratories of design with exhibition spaces, classrooms and lecture halls. The laboratories of design were devoted to such various activities as cabinetmaking, theatrical crafts, dyeing, weaving, printing and metalworking. The Bauhaus was enclosed by the famous glass curtains. The section containing the pupils' studio-dormitory rooms rose six stories.

The twenty-eight rooms it contained were intended not only for the students' residence but for their private work as well. Each room had a small balcony, a concrete slab which jutted out into open space. The students' building was connected directly with the School of Design through a one-storey wing. A separate wing was reserved for the Dessau trade school. A short two-storey bridge supported by four pillars connected it with the School of Design. This connecting bridge was reserved for administration rooms, meeting places for the masters and students' councils, the architectural department and the private studio of Gropius.

The Bauhaus had a skeleton of reinforced concrete. The continuous glass curtain was brought into abrupt juxtaposition with the horizontal ribbons of white curtain wall at the top and bottom of the building. In a bird's eye view the whole cube seemed like two immense horizontal planes floating over the ground.

The glass curtain was not the limited and marked off transparent area, which Eiffel had already exploited in the 1878 exhibition, it flowed smoothly around the building, the corners showing no vertical supporting or binding members. The pillars from which it hung were set behind the glass making the curtain a specimen of pure cantilever construction.

On the day the new Bauhaus – Dessau was opened, Gropius glowed with pride. The tall dormitory, the reinforced concrete and brick administration building with glass curtain walls, the flat-roofed shop and classroom wings gave striking contrasts, but the building had been unified through passages, bridges and courts. Facilities included auditoriums, library, exhibition hall and student canteen. The house which Gropius had designed for himself stood in a pine wood a few hundred yards away from the main building.

The Bauhaus prospered in its new location. Gropius added a department of topography and brought in specialists in construction. Because students now lived at the school, rules had to be established. Gropius stood for complete freedom for the individual, but by freedom he did not mean Bohemianism.

Gropius began to be busy with projects again. He studied the possibilities of prefabrication and became enthusiastic about the use of standardized parts because they could provide higher quality for lower costs. But when he was commissioned to build a large housing unit, he rejected the idea of complete prefabrication with each house exactly like its neighbour.

Around 1927, Gropius found it almost impossible to keep the school functioning smoothly. Hitler, who was rapidly gaining prestige, disliked modern architecture and called upon Germans to boycott it. Early in 1928 he decided to turn the school over to Hannes Meyer, head of the Department of Architecture and go back to private practice. He designed Municipal Employment bureau for Dessau, he built the first slablike, multistorey apartment house in Germany.

Exercise 1. Read the definitions of the following words and word combinations and memorize them.

studio – an artist's place of work.

dwelling – a residence.

pillar – a freestanding vertical shaft or column that serves as a support or stands alone as a monument.

skeleton – a structure that supports framework.

juxtapose – to put side by side.

concrete – a building material made by mixing water with cement, gravel, and sand.

prefabricate – to manufacture in standard sections for easy shipping and assembly.

Exercise 2. Find English equivalents for the following word combinations in the text.

Совместить школу искусства и ремесла; найти способ; соединить; запустить в действие; подготовительные курсы; масштаб; цвет; керамика; мастер; собрать под одной крышей; наследство; строительная площадка; строительные работы; школа дизайна; студия и жилые помещения; ядро школы; бетонная плита; выступать наружу; одноэтажное крыло; четыре столпа; железобетонный каркас; с высоты птичьего полёта; полный гордости; магазин с плоской крышей; библиотека; выставочный зал; сборные конструкции.

Exercise 3. Scan through the text and find paragraph that deals with the following topics.

- a. Gropius left his post.
- b. Prosperity of the Bauhaus.
- c. Bauhaus – Dessau was opened.
- d. Walter Gropius and his idea.
- e. The Bauhaus enrolment.
- f. Training period.

- g. Requirements for the new school.
- h. Features of the Bauhaus.

Exercise 4. Scan the text to find the information on the following aspects.

Walter Gropius' ideas and perspectives.

A launch of the new school.

The Bauhaus Building at Dessau (1926).

Exercise 5. Write an essay of 100-200 words to support your opinion.

Walter Gropius combined two schools, the Weimar Academy of Arts and the Weimar School of Arts and Crafts, into what he called the **Bauhaus**, or “house of building”.

Exercise 6. Write down the key sentence from each paragraph.

1. Walter Gropius is one of the outstanding architects and teachers of the 20th century.
- 2.

Task V. Write your own variant of the summary of the text.

Texts for Self-study and Analysis.

British Architecture

1. What makes the look of British towns and cities distinctive? The most striking feature is the lack of blocks of flats. People prefer to live in individual houses – units with their own front doors and sometimes gardens. Perhaps this says something about the national character; a love of privacy and a lack of interest in the wider community. There is a proverb: “An Englishman’s home is his castle.” Whatever the deeper reasons for it, the result is that British towns and cities are full of two or three-storey houses. Only in the 1950s and 60s did councils start building tall blocks of flats in the American style; but these have been very unpopular, and the cheaper ones are now being demolished.

Another distinctive feature of British buildings is the use of brick. Some of the oldest monuments, like Hampton Court Palace or Queens’ College, Cambridge, are made of brick. It remains the favourite material for new houses today. While the rest of the world prefers concrete, for some reasons the British taste is for brick, at least in smaller buildings.

2. Apart from some ancient churches, the oldest buildings you will see in Britain are castles. They are dotted all over the country, with many beautiful examples in Scotland and Wales. They were first built by the Normans after their invasion of England in 1066. The Tower of London dates from about 1078. Because of the Normans’ desire to control the population, they started to build castles everywhere, but especially in the more restless regions. For example, King Edward 1 built a series of massive castles in Wales at the end of the 13th century; his aim was to keep the lawless Welsh under English rule.

As the dominance of the English crown was established, the need for castles diminished. Then the use of gunpowder meant that they could no longer resist attack. So by the 15th century the castle-building age was over. Many Scottish castles are from a later period, but these are not military buildings; they are aristocratic family houses that imitated older styles.

3. Since the Middle Ages, architecture in Britain (as in most Europe) has been based on three major styles: Gothic, classical, and modern. The great early cathedrals and churches are in Gothic style – tall, with pointed arches and highly decorated; they are covered in sculptures of people, animal, and plants. The buildings are fantastic engineering achievements, constructed with very little machinery and designed by architects whose names have been forgotten. The tallest spire in Britain, at Salisbury Cathedral, is 123 meters high and was built in the 1330s. It is incredible that such size and perfection were achieved without a single crane or computer.

After the Gothic period, architectural fashion looked back to the classical age of Greece and Rome for its inspiration. So we see columns and triangular pediments as on Greek temples; round arches, domes and perfect Latin lettering as on Roman public buildings. Many of the finest London churches are in this style; St. Paul's Cathedral (built by sir Christopher Wren between 1675 and 1710) is the biggest and most celebrated, but there are many more all over the city.

4. Not only churches were in the classical style. Rich aristocrats built huge and impressive houses surrounded by parkland; they are on such a grand scale that it is difficult to imagine that they were once private homes, but of course they had dozens and sometimes hundreds of servants.

Many of the most beautiful parts of British cities consist of houses in this style. The period of kings George 1 to George 4 is known as the Georgian period, and cities such as London, Edinburgh, Bristol and Bath still today have large numbers of elegant Georgian houses, which give the streets a striking sense of unity and design.

5. In the 19th century, during the Victorian age (taking its name from Queen Victoria), architects went back to medieval Gothic ideas for their inspiration. At first sight it is 100 or 500 years old! At the same time, classical styles did not disappear altogether. In fact, there was a "Battle of the Styles" between classical and Gothic. The British Museum (1823) was a victory for classical, and the Houses of Parliament (1836) for the Gothic. There was also debate about the use of iron and steel: should these new materials be visible, as in the new bridges and railway stations, or hidden, as in the Natural History Museum, London, where the metal frame is covered by coloured brick and stonework?

6. From the 1920s on, new ideas were transforming art and music, and architecture, too, was caught up in the modernizing culture. People wanted buildings which were not just copies of the past. Having abandoned both classical and Gothic styles, the challenge was to create – to invent – something really new. Luckily, this change in attitude came at the same time as exciting new engineering materials were becoming available.

With concrete and steel together, and new types of glass, it was possible to escape from the traditional forms. For the first time in history, architects were free to make almost any shapes they liked.

Stonehenge

1. There is nothing quite like Stonehenge anywhere in the world and for 5000 years it has drawn visitors to it. We shall never know what drew people here over the centuries or why hundreds of people struggled over thousands of years to build this

monument, but visitors from all over the world come to marvel at this amazing feat of engineering.

Before Stonehenge was built thousands of years ago, the whole of Salisbury Plain was a forest of towering pines and hazel woodland. Over centuries the landscape changed to open chalk downland. What you see today is about half of the original monument, some of the stones have fallen down, others have been carried away to be used for building or to repair farm tracks and over centuries visitors have added their damage too. It was quite normal to hire a hammer from the blacksmith in Amesbury and come to Stonehenge to chip bits off. As you can imagine this practice is no longer permitted!

2. Stonehenge was built in three phases. The first stage was a circle of timbers surrounded by a ditch and bank. The ditch would have been dug by hand using animal bones, deer antlers which were used as pick-axes to loosen the underlying chalk, and then the shoulder blades of oxen or cattle were used as shovels to clear away the stones. Excavations of the ditch have recovered antlers that were left behind deliberately and it was by testing their age through radio-carbon dating we now know that the first henge was built over 50 centuries ago, that is about 3,100 BC. That's where the mystery begins. We haven't just found old bones, around the edge of the bank we also found 56 holes now known as Aubrey Holes, named after the 17th century antiquarian, John Aubrey, who found them in about 1666. We know that these holes were dug to hold wooden posts, just as holes were dug later to hold the stone pillars that you see today. So this was the first stage built about 5,050 years ago, wooden post circle surrounded by a deep ditch and bank.

3. Then about 4,000 years ago – 2,100 BC and about 2,000 years before the Romans set foot in Britain, it was rebuilt. This time in stone, bluestones were used which are the smaller stones that you can see in the pictures. These came from the Prescelli Mountains in Pembroke, South Wales 245 miles (380kms), dragged down to the sea, floated on huge rafts, brought up the River Avon, finally overland to where they are today. It was an amazing feat when you consider that each stone weighs about five tons. It required unbelievable dedication from ancient man to bring these stones all the way from South Wales.

4. Before the second phase of Stonehenge was complete work stopped and there was a period of abandonment. Then began a new bigger, even better Stonehenge, the one that we know today. Just under 4,000 years ago, about 2,000 BC, the third and final stage of what we see today.

The bluestones were dug up and rearranged and this time even bigger stones were brought in from the Marlborough Downs, 20 miles (32 kms). These giant sandstones or Sarsen stones, as they are now called were hammered to size using balls of stone known as 'mauls'. Even today you can see the drag marks. Each pair of stones was heaved upright and linked on the top by the lintels. To get the lintels to stay in place, the first

wood working techniques were used. They made joints in stone, linking the lintels in a circular manner using a tongue and groove joint, and subsequently the upright and lintel with a ball and socket joint or mortice and tenon. This was all cleverly designed on the alignment of the rising of the mid summer sun.

How did they get these stones to stand upright? The truth is nobody really knows. It required sheer muscle power and hundreds of men to move one of these megaliths, the heaviest of them weighing probably about 45 tons.

5. There are some wonderful myths and legends and you can hear them on the audio tour at Stonehenge in nine different languages, English, French, German, Dutch, Spanish, Italian, Swedish, Russian and Japanese.

Stonehenge was formerly owned by a local man, Sir Cecil Chubb, and he gave it to the nation in 1918 and it is now managed by English Heritage on behalf of the Government. In 1986, it was inscribed as a World Heritage Site and you can learn more about this on the World Heritage Site section. It is without doubt one of the finest prehistoric monuments in existence and an even more remarkable mystery.

The area is not special just because of the stones or the archaeologically rich landscape it sits in, but because of the plants that grow there. There is rare sedge grass and even the yellow and grey patches on the stones are tiny, slow growing plants called lichens.

6. It's thought that the name Stonehenge originates from the Anglo-Saxon period – the old English word 'henge' meaning hanging or gibbet. So what we have is literally 'the hanging stones', derived probably from the lintels of the trilithons which appear to be suspended above their massive uprights. Today the word 'henge' has a specific archaeological meaning: a circular enclosure surrounding settings of stones and timber uprights, or pits.

Three kilometres to the north-east of Stonehenge, Woodhenge is another henge monument. Dated to around 2,300BC, originally it comprised six concentric rings of wooden post. It was probably covered with a roof, or perhaps the wooden posts were joined in the Stonehenge fashion. Now, although there is no evidence for animal or human sacrifice at Stonehenge, some believe that the presence of the grave of a young child, found at Woodhenge, would seem to indicate a ritual sacrifice, possibly a dedicatory burial.

7. Another feature which is worth mentioning, which was built before the stone settings, is the Cursus – which lies to the north. It consists of two straight banks and ditches 90-130 metres apart running 2.8 kilometres in length, from east to west. When it was called the Cursus in the eighteenth century, it was thought to be some sort of racetrack. Some people also think that it has a processional ritual use. However, its true function remains a mystery.

The Story of Icehotel

1. In Swedish Lapland, 200 km north of the Arctic Circle, lies the village of Jukkasjärvi on the River Torne. Jukkasjärvi in Saami (Lappish) means "meeting place", which is what the former Saami village has been for half a millennium. Icehotel AB, the company that runs Icehotel, has worked with tourism since the mid-1970s, and offers a wide range of activities such as white-water rafting, fishing, visits to a Saami camp, reindeer and dogsledding tours.

Before Icehotel, very few tourists came to Jukkasjärvi during the long, dark, cold and snowy winters. In 1989, however, Jukkas AB (now Icehotel AB) decided to look upon winter as an asset instead.

2. It all started when, in 1989, some Japanese ice artists visited Jukkasjärvi, resulting in a much talked-about and written-about exhibition of ice art. Shortly afterwards, in spring 1990, a cylinder-shaped igloo was built directly on the ice of the River Torne, where an exhibition by the French artist Jannot Derid opened. Hundreds of visitors stared in amazement at the 60-square-metre art gallery, which was given the name Artic Hall. One night, some guests even spent the night there, in sleeping bags on reindeer skin - and the next morning they were ecstatic about the experience. Artic Hall was never meant to be used as a hotel, but the guests, well rested, assured us that it had been a warm and intense experience.

Icehotel, now in its thirteenth year, is continuing its successful and celebrated career as the world's biggest hotel made entirely of ice and snow. From its modest beginnings as a single room thirteen years ago, Icehotel has grown to 5,000 square metres built of 30,000 tons of snow and 4,000 tons of ice.

3. In the winter season 2001/ 2002, more than 14,000 guests spent the night in Icehotel and 37,000 day visitors walked in through the reindeer-skin covered doors. In this 60-room wintry fairy-tale land, there is a hotel reception, hall of pillars, Iceart exhibition, Absolut Icebar, Icehotel cinema, the fantastic Icechurch and of course hotel rooms. In the evening, the guests assemble in Absolut Icebar to have a drink "in the rocks" from iceglasses sculpted from the ice of the River Torne.

The Icechurch is a consecrated room of snow and ice in which church services, weddings and christenings take place.

At the end of October, around thirty local artists and builders start work, ahead of the arrival of the first guests in mid-December. Snow canons and front loaders help to form the snow over arched steel sections, some as big as 5 metres in height and 6 metres across. Two days later, the sections are moved and are ready to use somewhere else. The ice pillars are then put in place to give extra strength to the self-supporting snow arches. In March, ice is harvested from the River Torne with the help of tractors and special ice saws which were developed here in Jukkasjärvi. The pure river water, in combination with the fast-flowing current, gives crystal-clear ice. The ice blocks,

weighing almost 2 tons, are stored in our freeze-house for export and processing. Much of the stored ice is used in constructing next year's Icehotel.

4. By the beginning of December, the main building is almost finished and the interior work begins. This continues until the end of January. With an indoor temperature of around five below zero, working conditions are relatively comfortable compared to the outdoor temperature, which can drop lower than forty below zero. Working to late in the evening, the sculptors cut and work the ice to create things like interior decorations, windows, doors, pillars, furniture, lamps and naturally - sculptures. Specially invited Swedish and international guests artists come every year to design the décor in certain rooms.

5. The varied styles of the many artists, together with the properties of the ice, create a unique atmosphere: not unlike that in a museum, in fact - filled with magic, mystique and surprises for the visitors as they wander from room to room.

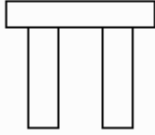
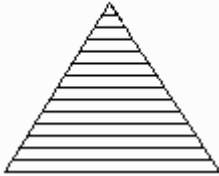
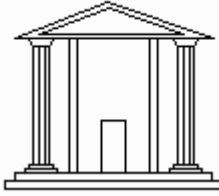
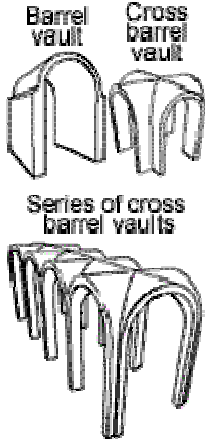
In winter 2000, a new chapter in the story of Icehotel AB began when operations were extended across the Atlantic - and co-operation began with Icehotel Québec in Canada. In the beautiful area of Duchesnay outside Québec, Icehotel Québec opens in January and closes at the end of March.

6. Another new chapter began in winter 2003 with the construction of "Ice Globe Theatre" - a replica of Shakespeare's "Globe Theatre" on the Thames in London. The project attracted large numbers of guests to the region. The building was a highly interesting challenge in its own right, and the goal was to unite that bastion of the Thespian arts, The Globe, with the beauty and magic of Icehotel.

Sadly, the sun's rays begin to melt the newly built Icehotel in late April. Although the last guests check out at the end of April, work continues into June, by which time Icehotel has become water hotel. To get a head start on the following winter season, the builders insulate thousands of tons of ice in Icehotel Art Center - a freezer covering 1,500 square metres, where there is also an ice and snow exhibition designed to give visitors a taste of Icehotel.

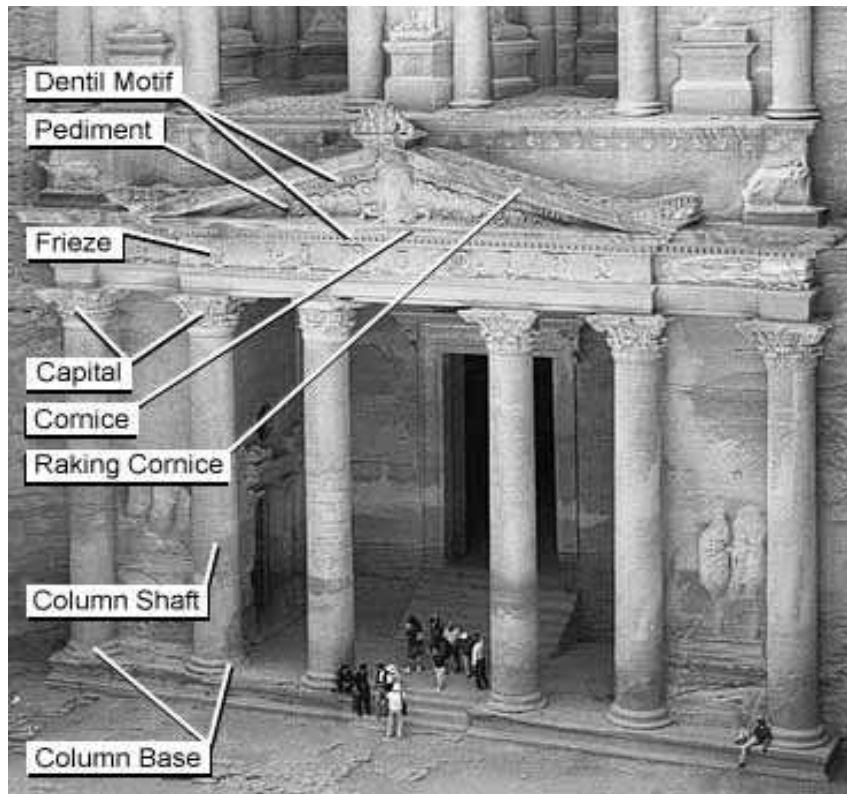
Appendix :

Architectural Styles:

Ancient	Description	
Neolithic (also known as the New Stone Age)	 Megalith stone system	[7000 - 3000 B.C.] cave dwelling, wattle and daub simple dwelling construction combined with timber and huge erected stones (megaliths) like Stonehenge.
<i>Egyptian</i>	 Stepped stone system	[3000 - 30 B.C.] royal tomb pyramids and temples constructed of layered cut stone block or hollowed out rock tombs. Columned or pillared halls, porticos (entryways) and sacred chambers embellished with historical or royal inscriptions and relief sculptures.
Greek	 Post-and-lintel system	[1200 - 30 B.C.] post-and-lintel (roof support) design. Colonnade porticos (entry ways) and roof detail including cornice surrounding the pediment on either end of the building length. Interior walls spanning the length of the building segment into rooms and provide roof support. Characterized by symmetric geometry and flanked with columns, capitals, cornices and pediments in a grid system.
Roman	 Barrel vault Cross barrel vault Series of cross barrel vaults	[200 B.C. - 500 A.D.] concrete coupled with formal engineering invented a new age of architecting both positive and negative space. Rounded arches, arcades (series of supported arches), vaults (elongated arch) and domes enabled buildings to have vast, un-broken spaces eliminating the need for support based designs of the past. These were enhancements from Greek and Etruscan design elements.
Middle Ages	Description	
Romanesque	[900 - 1150 A.D.] fortress like cathedral construction seeking to be fire and destruction proof which influenced the use of thick heavy stone work including the roof.	
Gothic	[1120 - 1500 A.D.] deviated from classic architecture of the Greeks and Romans by using pointed arches (not semi-circular or restricted to two arches per vault) and ribbing along the intersections of all arches. Analogous to a web or skeletal framework from which the building is encased. This style of architecture sought to increase the amount of light by opening up the interior space with many narrow pointed arches per vault and was mainly used for cathedrals. High gothic architecture saw the creation of the flying buttresses which were extensions of ribs from interior vaults to the outside, connecting downward to the floor level to complete the skeletal structure.	
Renaissance	[1350 - 1500 A.D.] Italian art and architecture characterized by embellished Roman	

	art and architecture.
Baroque	[1600 - 1750 A.D.] the age of discovery brings a passion to design. Overly ornate classical motifs and excentric mathematic architecture accented with bright colors and gold trim.
Romantism	[1750 - 1850 A.D.] opposition and departure from elaborate Baroque architecture, moving toward simple design which leads to Gothic revival.
Neoclassical	[1850 - 1900 A.D.] Greek and Roman revival.
<i>Modern</i>	<i>Description</i>
Art Nouveau	[1850 - 1940 A.D.] Flamboyant ornate motifs with strong organic curves. Architecture depicts cross lined designs, rounded corners and intersecting planes.
Art & Crafts	[1870 - 1960 A.D.] stylistic design of furniture and interior wood work emphasizing minimalistic design carried out through precise craftsmanship. English and Dutch origination.
International Style	[1910 A.D. - present] open expanses characterized by planes made possible through reinforced steel and concrete of the industrial age. Juxtaposition of form with elongated horizontals emphasized as seen in the work of Frank Lloyd Wright's work. Ornamental use is discontinued in favor of minimalism. This style remains relevant in today's architecture.
Bauhaus	[1925 - 1950 A.D.] exploitation of the international style with segmentation of space into modular units showcased in glass, screens and moveable walls. The movement emphasized the study of all aspects of art including performance, music, design, painting, and architecture as a cohesive whole.
Post Modern	[1925 - 1980 A.D.] departure from generalized style into individual expression through innovative use of new building technology and materials to differentiate the structure, space and experience from all previous styles. The Guggenheim Museum by Frank LLOYD Wright exemplifies the flamboyant deviation from all previous architectural movements.

Classical Architectural Detail & Trim Glossary



Capital	A decorative device generally placed at the top of a column.
Chair rail	Surround room at chair back height to prevent scuffing and damage to walls.
Column	May be load bearing or purely for looks. Typically has a capital at the top and base at the bottom.
Corbel	A decorative device like a Capital generally used for Pilasters, mantels, or load bearing shelf support.
Crown molding	Where the wall meets the ceiling to hide uneven surfaces and provide visual interest.
Frieze / Dentil molding	Typically below crown moldings, refers to a decorative band. The term dentil refers to the toothed pattern that alternating blocks give.
Medallions	Ornate accents applied to the ceiling and can act as chandelier focal points. The designs usually radiate out from center in ivy, floral, and celtic motifs.
Pediment	An ornamental accent found above entry ways and windows..
Pilaster	A rectangular column typically topped with a capital or corbel and trim for the base.
Picture / plate rails	Surround room near top of wall to facilitate hanging pictures. They range from a shallow shelf to slotted trim to accept a picture hooks.
Portico	Entrance area including facade.
Rosette	Small version of a medallion used to accent a mantel, wood work or curtain draw post.
Wall Niche	Recessed container used to showcase decorative elements like vases.

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UNIT VI

Road Engineering

Speciality: **Road Engineering**

Grammar: **The Article. Active and Passive Verb Forms. The Participle. Modal verbs. The Gerund. Comparatives and Superlatives. The Simple, Continuous and Perfect Tenses. The Infinitive. Relative Clauses.**

What Do Road Engineers Do?

At present the requirements for the engineers engaged in the design and construction of highways are very exacting. They are conversant with the methods of route selection and with the methods used to obtain field data required for design purposes. They design highways so as to ensure the comfort and safety of transportation. At the same time they take into account the local geophysical conditions which influence the construction and maintenance of highways.

Finally, when the highway is put into service, its maintenance and the provision for uninterrupted traffic become of the utmost importance for the national economy. The engineer in charge of the highway operation ensures the maintenance of the road quality under all traffic and weather conditions. He has a good command of the methods for counteracting the natural agents which threaten the road stability and which can interrupt the traffic (snow and sand drifts, frost heave, washouts by rain, landslides, floods, etc.).

Road engineers mechanize and technically develop the road-building operations, and provide for the most efficient and complete mechanization of the entire construction process.

Text A “The Basic Problems of Road Construction”.

Vocabulary

1. **design** [dI'zaIn] , n - проект;
2. **long-term** ['lON ' tWm], a - долгосрочный;
3. **traffic routes** ['trxfIk 'rHts], - транспортные пути;
4. **complex** ['kOmpleks], a - сложный;
5. **structure** ['strAkCq], n - сооружение;
6. **structural details** ['strAkCqrql 'dJteIlS] - конструктивные элементы;
7. **vehicle** ['vJIk1], n - транспортное средство;
8. **negotiate** [nI'gquSIeIt], v - преодолевать;
9. **bend** ['bend], n - изгиб;
10. **gradient** ['greIdjɒnt], n - уклон (дороги);
11. **skid** [skId], v - скользить, буксовать;
12. **overturn** ['quvɒtWn], v - переворачиваться;
13. **fatigue** [fə'tJg], n - усталость;
14. **land development** ['lɒnd dI'veləpmɒnt] - земельная застройка;
15. **interactive** [Intɜ'r'xktIv], a - интерактивный, находящийся во взаимодействии;
16. **environmentally acceptable** [In'vaIɜrqn'mentlI qk'septəbl] - экологически приемлемый;
17. **haulage** ['hɒlɪg], n - перевозка;
18. **preclude** [prI'klʌd], v - препятствовать, мешать;
19. **obstacle** ['Obstəkl], n - препятствие;
20. **broken** ['brɒkən], a - ломаный;
21. **align** [ə'lain], v - трассировать, прокладывать;
22. **aerial photographs** ['Fɜrɪql 'fɒtəgɜrɪfs] - фотографии с воздуха;
23. **chart** [CRt], n - диаграмма;
24. **soil** [sɔɪl], n - грунт;
25. **data** ['deɪtə], n, pl - информация;
26. **formation** [fɒr'meɪʃən], n - формирование;
27. **finishing** ['fɪnɪʃɪŋ], a - отделочный;
28. **operation** [ɒpə'reɪʃən], n - работа;
29. **labour-consuming** ['leɪbɜ kən'sʃəmɪŋ], a - трудоемкий;
30. **construction site** [kən'strʌkʃən 'saɪt] - строительная площадка;
31. **put into service** ['put 'ɪntu 'sɜvɪs] - вводить в эксплуатацию.

Task I. Read text A “The Basic Problems of Road Construction”.

6.1 Text A: “The Basic Problems of Road Construction”.

Roads are national property designed for long-term use. Present-day society would not be able to function without traffic routes which are vital for commerce and industry as well.

Nowadays roads are complex engineering structures; the calculations providing the basis for the design of individual road elements are often just as complicated as the design calculations for machine components, bridges and the structural details of public and industrial buildings. Road design should permit vehicles to negotiate bends and gradients without the danger of skidding and overturning and without causing fatigue and discomfort to passengers.

Road design is part of rational land development using modern techniques and democratic, interactive planning. Careful planning results in functional traffic systems which are environmentally acceptable and economical to construct and use.

Roads are intended for the haulage of goods and passengers with minimum of effort and at low cost. These requirements are satisfied if the road is built along the shortest distance, i.e. a straight line between two given points. However, the building of a road along the shortest distance is precluded by the topography of the land (mountains, ravines, etc.). It is also precluded by water obstacles (marshes, lakes, rivers). That is why roads are often built along the broken line of the plan.

Roads are located in the most varied natural conditions. Pavements and road subgrades are subject to the influence of many natural factors, e.g. heating by the sun; freezing and thawing, moistening by rain, etc. In all these diverse and complex conditions, when solving problems related to road construction, the use should be made of natural and historical sciences, i.e. geology, climatology, soil physics and mechanics, hydraulics, hydrology, etc.

When aligning the road, surveys are needed as a basis for the preparation of plans for a given project. The work of the road alignment survey includes the reconnaissance. The first step in any reconnaissance is to obtain all available data. These data may be in the form of maps, aerial photographs, charts and so on.

All road construction jobs involve considerable amount of earthwork. Basic earthwork operations may be classified as follows: clearing and grubbing; several special forms of excavation; the formation of embankments; and the finishing work. By “clearing” we mean the removal of trees and bushes from the designed area, while “grubbing” means the removal of roots and stumps. The term “excavation” refers to the removal of earth from its natural resting place. Excavated material must generally be transported to a different place.

To ensure all-year-round operation of traffic on a road the carriageway is covered with the pavement. The pavement is laid on the surface of the roadbed. It can be rigid or flexible. The pavement resists traffic stresses and climatic factors. The stresses induced in the pavement by motor vehicle wheels attenuate with the depth. This enables the pavement to be designed in the form of a multilayer structure.

Road jobs are essentially labour-consuming, demanding the extensive transportation of large quantities of materials. They also become complicated because of the big length of the construction site – often tens and hundreds of kilometers. This requires the introduction of a great variety of special technique: crawler tractors, bulldozers, scrapers, rippers, graders, crushers, rollers, screens, excavators and others.

Nowadays roads are part of society's infrastructure including streets, railways, harbours and bridges. Every year thousands of kilometers of new traffic routes are put into service.

Exercise 1. Read the definitions of the following words and word combinations and memorize them.

Pavement - дорожная одежда. Многослойная конструкция (в отдельных случаях однослойная), воспринимающая нагрузку от транспортных средств и передающая ее на грунтовое основание или подстилающий грунт.

Rigid pavement - дорожная одежда жесткая. Одежда, работающая как плита конечных размеров, лежащая на упругом однородном или слоистом основании при свободном, штыревом или другого вида сопряжении плит.

Flexible pavement - дорожная одежда нежесткая. Одежда, работающая как слоистая система бесконечных в плане размеров на грунтовом основании бесконечной или конечной толщины.

Subgrade (roadbed) – земляное полотно. Дорожное сооружение, служащее основанием для размещения конструктивных слоев дорожной одежды и других элементов дороги.

Hydraulics - гидравлика. Наука, изучающая законы движения и равновесия жидкостей, способы приложения этих законов к решению инженерных задач.

Hydrology - гидрология. Наука, изучающая гидросферу, ее свойства, процессы и явления, протекающие в ней во взаимосвязи с атмосферой, литосферой и биосферой.

Alignment - трассирование. Прокладывание трассы автомобильной дороги между заданными пунктами.

Road surveys - изыскания автомобильных дорог. Исследование экономических, технических и природных условий, в которых будут осуществляться строительство и эксплуатация автомобильной дороги.

- Reconnaissance** - изыскания технические рекогносцировочные. Комплекс изыскательских работ по предварительному изучению местности вдоль трассы проектируемой дороги.
- Earthwork** - работы грейдерные. Механизированные земляные работы в нулевых отметках, а также планировочные или профилировочные работы при строительстве земляного полотна или грунтовых дорог.
- Embankment** - насыпь. Инженерное земляное сооружение из насыпного грунта, в пределах которого вся поверхность земляного полотна расположена выше уровня земли.
- Finishing work** - отделочные работы. Комплекс земляных работ заключительного этапа по планировке и отделке откосов, обочин, резервов, поверхности земляного полотна автомобильных дорог, отделке мостовых и других инженерных сооружений.
- Carriageway** - проезжая часть. Основной элемент дороги, предназначенный для непосредственного движения транспортных средств.
- Scraper** - скрепер. Основная дорожная землеройно-транспортная машина. Рабочим органом является управляемый ковш разного объема с ножом на его кромке для зарезания при наборе грунта.
- Ripper** - рыхлитель. Дорожная машина для подготовительных работ при сооружении земляного полотна. Состоит из тяговой рамы, монтируемой в задней части трактора, с тремя - пятью стойками-зубьями.
- Grader** - грейдер. Прицепная к трактору колесная профилировочная машина с отвалом, который устанавливается под разными углами резания, захвата и наклона в зависимости от выполняемой технологической операции.
- Crusher** - дробилка (камнедробилка). Общестроительная машина, предназначенная для переработки дроблением кусков горных пород (камня, гравия, валунов).
- Screen** - грохот. Один из видов обогащенного оборудования для сортировки песчаных, гравийных, щебеночных и других сыпучих материалов. Имеет сита с отверстиями разных форм и размеров.

Exercise 2. Use the words from the Vocabulary and put them in the blanks.

1. Under the conditions of rain or snow the car can 2. It was Christopher Wren who ... St. Paul's Cathedral. 3. The shots taken directly from the plane are called 4. Chopping wood is very ... job. 5. Children should be reminded that there is no admittance to the 6. You can place order for prompt delivery or ... delivery of the computers to be used in your office. 7. The newest technologies being introduced on TV, the ... communication between the journalist and the viewers has become possible. 8. The most widely accepted definition of a computer includes the following ... : input, processing, output, storage. 9. ... works are the last but not the least stage in completing any building project. 10. Last year the new cable-stayed bridge was ... in our town.

Exercise 3. Match the words from two columns.

- | | |
|----------------|-----------------|
| 1. calculation | a. овраг |
| 2. topography | b. нагревание |
| 3. ravine | c. расчет |
| 4. thawing | d. увлажнение |
| 5. harbour | e. таяние |
| 6. moistening | f. порт |
| 7. heating | g. топография |
| 8. society | h. многослойный |
| 9. ripper | i. общество |
| 10. multilayer | j. рыхлитель |

Exercise 4. Put the articles a, an, the or zero article into the gaps.

1. Road construction hasn't been always known to ... man. 2. Mr. Brown, ... senior vice president for ... locally-based engineering company, said that ... project would improve traffic safety on one of ... most heavily traversed urban highways in ... world. 3. ... innovative reversible-lane elevated toll road is beginning to take shape in ... Hillsborough County, Florida. ...three-lane, precast concrete elevated portion is being built on piers within ... median of ... Lee Roy Selmon Crosstown Express Way. 4. Materials used in ... construction of ... Roman roads were ... gravel, ... cobblestone and ... hewn stone in ... form of ... slabs. 5. ... Arkansas State Highway and Transportation Department is using netting to prevent nesting, which delayed ... last year's key bridge project by more than three months. 6. This is ... very Ralph Hall, ... chief engineer for ... transportation department, I told you about. 7. ... motorway is ... complex engineering structure incorporating ... lot of structural details. 8. At ... distance of several miles from ... big cities and towns traffic intensity decreases. 9. Winston Churchill, ... famous English Prime Minister, called ... car the curse of ... twentieth century. 10. Motorway signs are ... source of the important information for ... driver.

Exercise 5. Find the passive verb forms in the text.

Example: are intended.

Exercise 6. Put the verbs in brackets in the correct tense, Active or Passive.

1. Modern highways ... (design) for high speed motor traffic. 2. The science of road construction ... (depend) on the achievements of physical, mathematical and natural sciences. 3. The wheel ... (invent) about four to five thousand years B.C. 4. Roman roads ... (build) during seven centuries. 5. When completed the new project ... (help) reduce car exhaust levels somewhat. 6. Before last year this road section ... (repair) only once. 7. Since the snow ... (push) to the nearside of the carriageway, the road is now open to traffic. 8. In order to determine the layout of the road the total number of vehicles on the road at a given period ... (take) as the major design criterion. 9. At the moment the screen ... (grade) gravel, chips and other dry substances by passing them through the sieve with the meshes of different size and shape. 10. Some definite form of soil survey ... (adopt) by many countries.

Exercise 7. Find the Participle forms in the text and define their functions.

Example: designed.

Exercise 8. Translate the sentences with the Participle.

1. Road engineering is one of the earliest arts known to mankind. 2. The motorway being constructed is intended to relieve the traffic congestion. 3. Traffic jams and growing pollution in the historic German city Luneburg forced the local council to encourage people to leave their cars at home, regular fast public transport was introduced. 4. When completed, the expressway will provide added capacity to the direction most traveled by morning and evening commuter traffic. 5. Some people spend their lives collecting valuable cars. 6. The earliest bridges were naturally fallen trees across waterways. 7. Located on Chicago's south side, Chicago's Dan Ryan Expressway accommodates more than 300,000 vehicles daily in eight to 14 lanes traveled by morning and evening commuter traffic. 8. Replacing the traveler added at least six months to the project. 9. Having built one cable-stayed bridge in Savannah, it was logical to do the same in the other places. 10. Spoil banks are heaps of excessive soil remaining after the excavation of cuttings.

Exercise 9. Translate into English.

1. Современное общество не могло бы существовать без транспортных путей, которые необходимы для перевозки пассажиров и грузов. 2. Дороги всегда играли важную роль в развитии торговли. 3. Топография местности не позволяет проектировать дороги по прямой линии. 4. Для того, чтобы обеспечить бесперебойное движение транспорта по дороге в любое время года и при любой погоде, проезжую часть покрывают дорожной одеждой. 5.

Погодные условия оказывают влияние на состояние дорожной одежды и земляного полотна. 6. Широкое использование большого разнообразия современной техники делает дорожно-строительные работы менее трудоемкими. 7. Термин «изъятие грунта» означает удаление земли с ее естественного местоположения. 8. Удары, наносимые дорожному покрытию колесами автомобилей, ослабевают с глубиной. 9. Современные дороги являются частью общественной инфраструктуры, включая улицы, железные дороги, порты и мосты. 10. Каждый год тысячи километров новых дорог вводятся в эксплуатацию.

Exercise 10. Answer the questions using the following expressions: *I think that ..., it should be noted that ..., it is no doubt that ..., it should be mentioned that ..., I'm quite sure that..., etc.*

1. Are roads important for present-day society?
2. Why is road design so complicated nowadays?
3. What are roads intended for?
4. What obstacles preclude the building of roads along the shortest distance?
5. The influence of what natural factors are pavements and road subgrades subject to?
6. When are surveys needed in road construction?
7. How may basic earthwork operations be classified?
8. What is the carriageway covered with?
9. Why are road jobs essentially labour-consuming and complicated?
10. Are many new roads put into service every year?

Text B “Characteristics of Urban Highway Construction”.

Vocabulary

- | | |
|--|---|
| 1. urban [ˈwɒqn] a | городской; |
| 2. rural work [ˈruqrql] | строительство дорог общего пользования; |
| 3. built-up areas [ˈbɪlt ˈʌp ˈfɜrɪqz] | районы со сложившейся застройкой; |
| 4. tight [taɪt] a | трудный, затруднительный; |
| 5. obstruction [ɒbˈstrʌksqn] n | препятствие; |
| 6. manner [ˈmɛnɔ] n | способ; |
| 7. intimately [ˈɪntɪmɪtli] adv | тесно; |
| 8. restraint [rɪsˈtreɪnt] n | ограничение; |
| 9. preplanning [ˌprɪˈplɛnɪŋ] n | предварительное планирование; |
| 10. draw up [ˈdrʌ ˈʌp] v | составлять (программу); |
| 11. monitoring [ˌmɒnɪˈtɪrɪŋ] n | контроль; |
| 12. initial [ɪˈniʃl] a | первоначальный; |
| 13. flexibility [ˈfleksɪbɪlɪti] n | гибкость; |
| 14. adhere (to) [əˈdʰɪɔ] v | придерживаться чего-л.; |

15. **divert** [daɪ'vʊt] v переносить, переустраивать, отводить в сторону;
16. **delay** [dɪ'leɪ] n задержка;
17. **statutory undertakers** ['stxtʃutqrɪ 'ʌndq'teɪkqs] специалисты городского коммунального хозяйства;
18. **encourage** [ɪn'kʌrɪɡ] v поощрять, побуждать;
19. **place order** ['pleɪs 'ɒdɜː] делать заказ;
20. **long delivery** ['lɒŋ dɪ'lvɪqrɪ] долгосрочная поставка;
21. **lay** [leɪ] v прокладывать;
22. **piecemeal construction** ['piːsmɪl kɒn'strʌkʃn] сдельная работа;
23. **peak-hour** [pɪk 'aʊɜː] час-пик;
24. **density** ['densɪtɪ] n дорожная пробка;
25. **one-way system** ['wʌn 'weɪ 'sɪstɪm] система с односторонним движением транспорта;
26. **re-route** [rɪ'rɒt] v изменять прежнее направление движения по определенному маршруту;
27. **erection** [ɪ'rekʃn] n установка;
28. **maintain** [meɪn'teɪn] v поддерживать;
29. **inherent** [ɪn'hɪqrɒnt] a неотъемлемый;
30. **pedestrian** [pɪ'destrɪqn] n пешеход;
31. **cater for** ['keɪtɜː 'fɒr] v заботиться;
32. **keep clear** [kɪp' kɪlɪɜː] не допускать;
33. **well-barriered** ['wel 'bærɪqrɒd] хорошо огражденные.

Task II. Read text B “Characteristics of Urban Highway Construction”.

6.2 Text B: “Characteristics of Urban Highway Construction”.

Urban highway construction differs from rural work in many respects, just how different is sometimes not appreciated.

First the alignment through built up areas is much tighter, with frequent obstructions in the form of crossing roads and public utility services which often dictate the manner and sequence of operations.

The contractor can no longer plan and execute the job to suit himself, the preplanning and coordination required to draw up a programme is considerable. Furthermore, planning and monitoring progress has to assume much greater importance than on rural construction. Nor is there the flexibility of programme. With so many restraints the initial programme has to be realistic and it has to be adhered to.

Management organization and attitudes are also different, and control is more likely to be geographic than operational as the various operations are more intimately tied up with one another due to the restraints. It is necessary to create teams of skilled professional engineers and managers to carry out the complex urban highway projects successfully.

The necessity to deal with and divert statutory undertaker's services is the biggest external restraint in urban highway construction and often dictates the sequence and method of construction. It is therefore essential that statutory undertakers be brought in at the earliest stage of the planning so that the basic programme can be thoroughly formulated. Because of possible delays the statutory undertakers should be encouraged to place orders for long delivery materials, pipes, cables, etc., as soon as their work is defined. As much diversion work as possible should be carried out prior to the construction contract even if this means laying at extra depth. This cost is usually small when compared with the additional price of piecemeal construction.

Urban highway construction inevitably causes disruption to traffic, and with present day peak-hour densities, this disruption can be considerable.

The major decisions on how to deal with the problem have to be taken at the design stage. These could involve new one-way systems, the re-routing of traffic, changes in direction of flow and so on, associated with the completion of certain stages in the construction, and the erection and changing of adequate traffic signs. Sometimes traffic cannot be diverted and there is no simple solution to the problem. If the disruption is likely to be of long duration then the provision of temporary bridges or their temporary structures should be considered at the design stage.

Construction is often affected by having to maintain traffic flow on roads affected by the works. Not only is work made difficult but there is an inherent additional danger to traffic using the road and more consideration could be given to closing roads during construction even for limited periods. In addition to the safety aspect the work could be speeded up considerably.

It is in contractor's own interests that traffic disruption be kept to a minimum for he is likely to suffer himself in bringing in materials and servicing the various parts of the site.

Pedestrians also have to be catered for and must be kept clear off the works for their own safety. Safe and well-barriered footpaths must be provided and maintained.

Urban highway construction requires a greater attention to detail, and an ability to keep under constant control a mass of detailed interests other than the works themselves.

Exercise 1. Read the definitions of the following words and word combinations and memorize them.

Public utility services -

инженерные коммуникации. Силовые кабели, линии связи, сигнализации, теплотрассы, водоводы, ливневые и напорные канализации.

Contractor -

подрядчик. Организация, выполняющая работы на основании договора с заказчиком.

Statutory undertaker's services -	инженерные коммуникации, которые могут прокладываться в коллекторы.
Disruption -	ограничение. Ограничение движения дорожно-транспортных потоков при строительстве или ремонте дороги.
Flow -	транспортный поток. Транспортные средства, движущиеся в одном направлении.
Traffic sign -	дорожный знак. Элемент обстановки дорог, содержащий условные обозначения или надписи, информирующие об условиях движения, его особенностях и необходимых режимах, а также о маршруте движения.

Exercise 2. Choose the correct word from the two words given in brackets.

1. Various road building operations are more intimately tied up with one another in ... (urban; rural) construction. 2. In urban highway construction the contractor can't plan and execute the job to ... (please; suit) himself. 3. As various operations are more intimately tied up with one another control is more likely to be ... (operational; geographic). 4. The statutory undertakers should be encouraged to place orders for pipes, cables, etc. in advance because of possible ... (shortages; delays). 5. In urban highway construction the ... (initial; flexible) programme has to be adhered to by the contractor. 6. The major decisions on how to deal with the problems of disruption to traffic have to be taken at the ... (construction; design) stage. 7. The solution to the problem of disruption to traffic could involve the ... (completion; erection) of adequate traffic signs. 8. If the disruption is likely to be of long duration then the provision of temporary (bridges; tunnels) should be considered. 9. Pedestrians must be kept ... (off; from) the works for their own safety. 10. Urban highway construction requires a greater attention to (element; detail).

Exercise 3. Match the words and their definitions.

1. stage	- highly professional and experienced.
2. environment	- the time of the day when the streets and roads in the vicinity of the big cities are overcrowded by traffic.
3. peak-hour	- a point of development.
4. coordination	- not involving risk or danger.
5. skilled	- bringing into order as parts of a whole.
6. safe	- surroundings or conditions of life and growth.

- | | |
|-------------|--|
| 7. progress | - easily changed to suit new conditions. |
| 8. sequence | - additional; larger, better than usual. |
| 9. extra | - onward movement, development. |
| 10 flexible | - a connected series, a succession. |

Exercise 4. Which adjectives describe urban highway construction? Which describe rural highway construction?

Tight, frequent, flexible, skilled, complex, operational, geographic.

Exercise 5. Complete the conversations as shown in the example.

Example:

A: The alignment through built-up areas is tighter than through the open country (tight).

B: Yes, that's true. To carry out the works in the narrow streets of the city centre is the tightest of all.

- a) A: The city has got ... obstructions to road construction works than the country (many).
B: Yes, certainly. It is the city that has got obstructions in the form of crossing roads and public utility services.
- b) A: On rural work the planning is than in urban highway construction (considerable).
B: On the contrary. In urban highway construction the planning is
- c) A: Urban highway projects are than rural highway projects (complex).
B: I think so. Urban highway projects are
- d) A: It is essential that the statutory undertakers be brought in than a programme is drawn completely (early).
B: Yes, it is. The statutory undertakers should be brought in at stage of the planning.
- e) A: The ... the statutory undertakers place orders for long delivery materials, pipes, tubes, etc., the ... (soon/good).
B: I'm quite agree with you. It is way to deal with the problem of possible delays (good).
- f) A: The solution to the problem of the disruption to traffic is ... in urban highway construction than on rural work (simple).
B: But it isn't. The solution to this problem on rural works is one of
- g) A: The Church Road is ... than the Chestnut street (long).
B: Yes, of course. The Church Road is street in the town.
- h) A: The traffic on a road is for the pedestrian than for the driver (dangerous).
B: Not at all. It is for those who don't observe the traffic rules.
- i) A: While driving a car it's to keep to the right than to the left (convenient).
B: I'm afraid not. To steer in the way to which you have used to is

Exercise 6. Put *can, could, have to, should, must* into the gaps.

1. The new parking garage ... house two thousand cars. 2. The traffic rules ... be observed by everyone. 3. Since the lane is closed due to the works, the drivers ... slow down to 25 m.p.h. when reaching the junction. 4. The construction of hard-surfaced roads led to the mechanization of transport, because horse-drawn transport ... no longer cope with the increased goods traffic. 5. In the town of Delft in Holland offices ... provide one secure bicycle space for every three employees, and each house ... have a bicycle garage. 6. People ... be careful when driving a car in the peak-hour. 7. Ask Mr. Brown. He ... be an authority on the subject of diverting statutory undertaker's services. 8. You ... never lose your way with a road map in your hands. 9. Individual initiative ... be stimulated. 10. You ... see the sea from our bedroom window. 11. When Jim was 15, he ... run 100 metres in 11 seconds. 12. Nobody answers the doorbell. They ... be out. 13. Environmentalists ... really do something about pollution. 14. Students don't ... wear uniform. 15. Jane ... stop being day-dreaming at the classes. Otherwise she will fail the examinations.

Exercise 7. Find the Gerund forms in the text.

Example: planning.

Exercise 8. Choose the sentences with the Gerund.

1. The town of Delft in Holland has solved its traffic problems by encouraging people to cycle. 2. The major Roman roads were of solid stone construction incorporating up to 10 to 15 thousand cubic metres of stone per kilometre. 3. Borrow-pits are shallow excavations from which the soil was used for filling the embankments. 4. In the second half of the 18th century research was undertaken with a view to finding more rational methods of using stone for pavement construction. 5. The possibility of carrying a greater load on wheels than could be moved by dragging it, called for a corresponding improvement in carriageway and bridge flooring. 6. For some people, the car is a convenient form of transportation but for others, the car is an exciting hobby. 7. Major repairs include restructuring local access to the highway and overhauling its water-drainage system. 8. Trying to squeeze 300,000 cars into a highway originally designed for 150,000 has taken its toll on the 40-year-old arterial expressway, which accounted for 7,800 accidents and 32 deaths. 9. If additional load bearing capacity is required this can be easily achieved by thickening the pavement. 10. Tresquet's system consisted in building the road pavement in a wide trench.

Exercise 9. True or false.

1. Urban highway construction is the same as rural work.
2. The alignment through built-up areas is an easy task.
3. There are a lot of restraints in urban highway construction.
4. Different operations are very closely tied up with one another.

5. The contractor plans and executes the job at his own convenience.
6. Statutory undertaker's services can be laid or diverted at any stage of the construction.
7. Professional skills of the staff are an important part of a success in carrying out the complex urban highway projects.
8. Present day peak-hour densities contribute to the problem of disruption to traffic.
9. Disruption to traffic can never be of long duration and generally it can be easily avoided.
10. Safety measures must be provided on roads affected by the works.

Exercise 10. Using the information of the text, characterize:

- a) the peculiarities of the planning and control when building the city roads.
- b) the obstructions that make urban highway construction tight.
- c) the work of the statutory undertakers.
- d) the ways and methods of solving the problem of disruption to traffic during construction.
- e) the safety measures that must be taken on roads affected by the works.

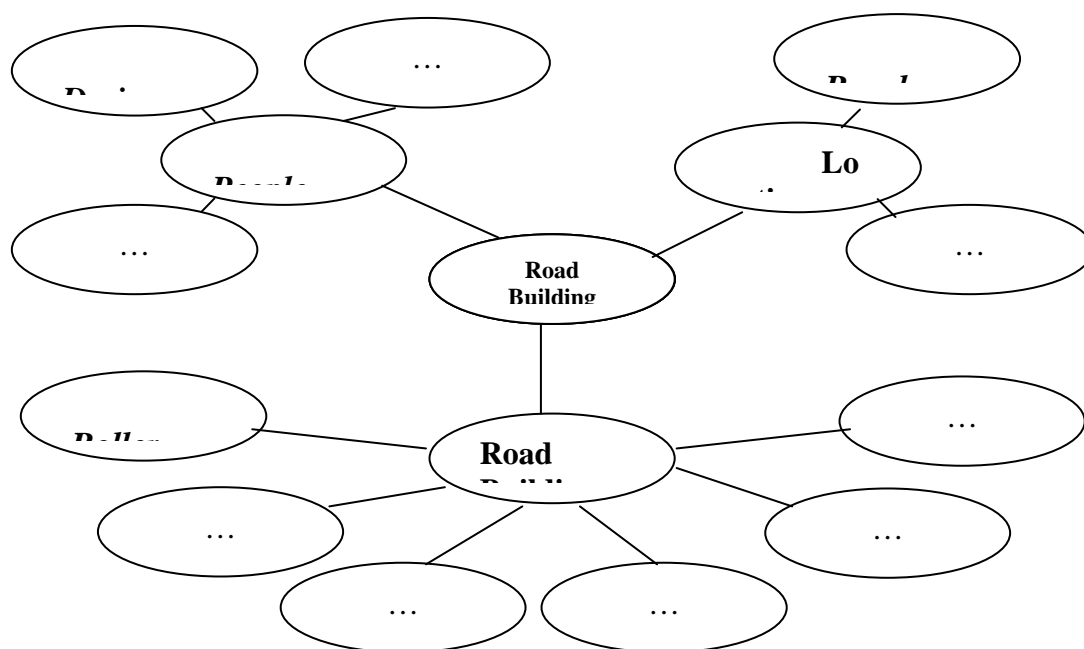
Exercise 11. How many differences between urban highway construction and rural work can you find in the text? Fill in the table using the characteristics of both.

Urban Highway Construction	Rural Highway Construction
1. Frequent obstructions in the form of crossing roads and public utility services.	1. Fewer obstructions.
2. No flexibility of planning.	2. ...
3. ...	3. ...
4. ...	4. ...

Exercise 12. Speak about urban highway construction using the key words and word combinations.

Rural work; the alignment; built up areas; obstructions; preplanning, coordination; flexibility; restraints; management organization and attitudes; control; teams of skilled professional engineers and managers; statutory undertaker's services; delays; long delivery materials; disruption; one-way systems; the re-routing of traffic; adequate traffic signs; temporary structures; traffic flow; additional danger; safety aspect; pedestrians; well-barriered footpaths; attention to detail.

Exercise 13. Build up the scheme.



Text C “Highway Transport and Environment”.

Vocabulary

- | | |
|--|------------------------------|
| 1. motorway [ˈmɒtəweɪ], n - | автострада; |
| 2. urban scene [ˈʊbən ˈsiːn] - | вид города; |
| 3. show room [ˈʃəʊ ˈruːm] - | оставлять место; |
| 4. strike (struck; struck) [straɪk; strʌk], v - | находить; |
| 5. extra [ˈekstrə], a - | дополнительный; |
| 6. free flowing [ˈfriː ˈflaʊɪŋ] - | свободно движущийся; |
| 7. entertainment [ˌentəˈteɪnmənt], a - | развлечение; |
| 8. fix [fiks], v - | чинить; |
| 9. cellular phone [ˈseljʊlə ˈfəʊn] - | сотовый телефон; |
| 10. pollution [pəˈluːʃən], n - | загрязнение; |
| 11. freeway [ˈfriːweɪ], n - | автострада; |
| 12. crowded [ˈkraʊdɪd], a - | переполненный; |
| 13. parking lot [ˈpɑːkɪŋ ˈlɒt] - | автостоянка; |
| 14. gain [geɪn], n - | выгода |
| 15. remedy [ˈremɪdi], n - | средство (решения проблемы); |
| 16. exhaust [ɪɡˈzɔːst], n - | выхлопные газы; |
| 17. motive power [ˈmɒtɪv ˈpaʊə] - | двигатель; |
| 18. gasoline-powered [ˈɡæsoʊlɪn ˈpaʊəd] - | работающий на бензине; |
| 19. save [seɪv], v - | экономить; |
| 20. fuel [fjuːl], n - | топливо; |
| 21. odourless [ˈoʊdərlɪs], a - | без запаха; |

22. **fume** [f jHm], n -

ДЫМ, ВЫХЛОПНЫЕ ГАЗЫ.

Task III. Read text C Highway Transport and Environment.

6.3 Text C: “Highway Transport and Environment”.

1. Associated with highway construction are two types of environment problems: (1) that concerning the design and construction of the road itself such as landscaping, design of bridges and other structures, etc., and (2) that associated with the traffic that uses the highway after construction.

2. In the first category there can surely be little complaint about the landscaping of motorways and new trunk roads either in open country or in urban areas. Some complexes of motorways have improved the urban scene immeasurably. Structures generally still show room for improvement and here a balance has to be struck between what is environmentally desirable and the extra cost of providing it.

3. On the second aspect of the road environment it must always be remembered that all countries have a vital need of free flowing, flexible, and efficient transport. The car helps people to travel long distances quickly and easily. It brings them much closer to places of work, study, and entertainment. Many people also work in car-related industries: fixing cars, washing cars, advertising cars, and selling car products such as stereos and cellular phones. For many people, cars are more than transportation: they are a source of passion and pleasure.

4. Most Americans buy a new car every five or six years. This means that one American may own a dozen cars in a lifetime. In fact, there are more cars than people in the United States. In New York City, 2.5 million cars move in and out of the city each day. In this traffic, the average speed is sometimes 8.1 miles per hour. This speed could easily be reached by riding a horse instead of driving a car. But New Yorkers continue to drive, just as people in California, where freeways are often very crowded.

5. At the same time many people are unhappy with car traffic and pollution, as well as with the use of beautiful land for building new roads. One environmentalist, Jan Lundberg, left his Mercedes-Benz in Los-Angeles and moved to the forests of northern California. There he works on the Auto-Free Times, a newspaper that teaches people how to live without driving. He travels on foot, on bicycle, or by bus. Lundberg and other environmentalists dream of turning parking lots into parks and replacing cars with bicycles.

6. There can be no gain in restricting highway improvement of traffic flow. The remedy, as far as environment is concerned, surely lies in the opposite direction and also in improving the transportation vehicles by the reduction of road and engine noise and exhaust pollution, by very careful land development, and by developing electric or other quieter motive power.

7. The electric car is not a new idea. It had success with American women in the early 1900s. Women liked electric cars because they were quiet and did not pollute the air. Electric cars were easier to start than gasoline-powered ones. But gasoline-powered cars were faster, and in the 1920s they became much more popular.

8. Today there is a new interest in the electric car, which is partly related to a passion for speed and new technology. The Toyota Company recently decided to spend \$800 million a year on the development of new car technology. Many engineers believe that the electric car will lead to the other forms of technology being used for transportation.

9. Some environmentalists believe that forms of public transportation have not been fully developed. They try to teach others that public transportation saves fuel and helps to protect the environment. We seem to remember, for instance, that trolley-buses were very quiet and odourless public vehicles. For economic reasons they were taken out of service, and noise and fumes creating diesel buses were substituted.

10. Environment, as we said, has to be paid for, but certainly it must not be at the expense of the free flow of traffic on properly designed arterial and urban ring roads. Poet Curt Brown believes that cars are part of our passion for new places and new experiences. According to Brown, this "very, very comfortable flying chair" will continue to bring us travel and adventure, no matter how it changes the future.

Exercise 1. Read the definitions of the following words and word combinations and memorize them.

Landscaping - проектирование ландшафтное. Метод проектирования дорог, обеспечивающий плавность сопряжения между собой элементов дороги и гармоничное сочетание дороги с окружающей местностью.

Trunk road - автомобильная дорога общей сети. Дорога общего пользования, обеспечивающая движение транспортных средств, отвечающих (по нагрузкам и габаритам) требованиям государственного стандарта.

Traffic flow - транспортный поток. Общее количество транспортных средств, проходящих через любой участок дороги в единицу времени.

Arterial road - автомагистраль. Дорога большой протяженности и высокой пропускной способности,

предназначенная для движения транспортных средств с высокими скоростями, с разделительной полосой для разобщения встречных транспортных потоков, не имеющая пересечений с другими путями на одном уровне.

Exercise 2. Find the English equivalents for the following word combinations in the text.

Ландшафтное проектирование; автомобильная дорога общей сети; открытая местность; районы города; вид города; оставлять место; дополнительные затраты; насущные нужды; свободно движущийся транспорт; сферы деятельности, связанные с производством продаж или ремонтом автомобилей; ремонт автомобилей; мойка автомобилей; сотовый телефон; загрязнение окружающей среды автомобильным транспортом; автостоянка; транспортный поток; противоположное направление; шум мотора; загрязнение выхлопными газами; земельная застройка; автомобили, работающие на бензине; защищать окружающую среду; вывести из эксплуатации; за счет чего-л.; кольцевая дорога.

Exercise 3. Put the verbs in brackets in the correct tense form, Simple, Continuous or Perfect.

1. The existing motorways ... (to be designed) using modern techniques and democratic, interactive planning. 2. McAdam ... (lay) the broken stone in layers of 4 to 5 inches, to a camber of about 1 in 30. 3. Modern society's infrastructure ... (include) streets, railways, harbours, bridges, public utilities and recreational areas. 4. By the end of the fifth century the Roman Empire ... (be conquered) by the Germanic barbarians. 5. From the time of its foundation till now this well known and respectful firm ... (provide) its clients with recommendations, methods and systems from which to choose. 6. In the second half of the 18th century, owing to scarcity of suitable material and the high cost of labour, the amount of stone material ... gradually ... (be being reduced). 7. According to the reconstruction plan in a half-a-year period the construction teams ... (make) the old slip road suitable for high-speed motor traffic. 8. The traffic flow on a road ... (not/remain) uniform throughout the year. When seasonal agricultural activity ... (be) high, especially during the harvest, traffic intensity on country roads ... (build up) appreciably. 9. The Roman highway network ... (be being built) during seven centuries. 10. The following discussion of each paper at the conference (be going) to take no more than 10-15 minutes.

Exercise 4. Find the Infinitive forms in the text.

Example: to travel.

Exercise 5. Translate the sentences with the Infinitive.

1. The local authorities have developed an efficient bus network to transport people rapidly around the city. 2. It is usually quick and easy to switch from one bus route to another. 3. To live is to hope. 4. Prague is believed to be the most beautiful European capital. 5. In Athens, car owners are only allowed to drive into the city centre every other day. 6. The contract to be signed is being discussed. 7. Mr. Smith is proud to have been working for the company all these years. 8. The visitors are unlikely to have been invited. 9. The driver wanted the car to be filled up. 10. The conference was supposed to be making good progress. 11. The greater is the number of vehicles in a stream, the more severe are the requirements to be satisfied by the road. 12. English is known to have adopted a lot of French words. 13. Government rules require all shops to provide parking spaces for bicycles. 14. If one is to take into account secondary earth and gravel roads, the total length of the Roman Empire road network would attain 300 thousand kilometers.

Exercise 6: Complete the text using the linking words.

because so that and that who which where

British roads are classified in three groups. The arterial roads are called so ... they might be compared to the arteries in the human body. They are known as A or Class I roads. The second group consists of B or Class II roads ... are a little less important than A roads. Last comes the third group ... has no official name. The number of each road of the first two classes appears on all signposts ... a motor driver can find his way across Britain.

In many countries there are high-speed motorways, e.g. the German "autobahnen" or Italian "autostrade". The motorists ... are admitted to them only at special gates can travel 80 or 90 miles an hour.

In Russia there is the federal road classification ... the roads are divided into the following groups according to their importance for the national life of the country, as well as according to administrative needs:

1. Federal roads.
2. Regional roads.
3. Local roads.
4. Internal economic roads.
5. Town roads and streets.

Exercise 7. Skim through the text and write in the numbers of the paragraphs that deal with the following topics.

1. The all nations' vital need for motor transport.
2. To live without cars is possible.
3. The success of the electric car in the last century.
4. Public transportation is the remedy.

5. Two types of environment problems.
6. The promising future of the electric car.
7. The landscaping of roads and environment.
8. Possible ways of solving environment problems.
9. The free flow of traffic has the priority.
10. The country of cars.

Exercise 8. Scan the text to find the information on the following aspects.

Americans are great car-lovers.

Present-day landscaping of roads contributes the better look of towns and cities.

The biggest car companies are interested in new technologies.

Travelling by car is a convenient form of transportation.

Trolley-buses are the kind of transport that has a lot of advantages.

Electric cars were favoured by American women.

Environment problems concerning the design and construction of the road itself can easily be solved.

Riding a horse sometimes can turn out to be quicker than driving.

The car creates new jobs.

Some people dream about the life without cars.

Task II. Do you agree or disagree with the following opinion? Write an essay of 100-200 words to support your opinion.

Environmentalists are saying that we should put more money into public transport.

Task III. Write down the key sentence from each paragraph.

Example:

1. Associated with highway construction are two types of environment problems.
- 2.

Task IV. Read the summary of paragraph 3.

The paragraph *emphasizes* the idea of the importance of motor transport for all countries. *It describes* in what way cars are useful to people in their everyday life. *In conclusion it is mentioned* that cars can also be a source of passion and pleasure for their owners.

Task V. Write your own variant of the summary of paragraph 4 using the following expressions.

The paragraph	<p> makes it clear ... points out ... considers ... reveals ... conveys ... touches upon ... contains ... reports ... emphasizes ... stresses ... carries out ... describes ... </p>
It is	<p> mentioned ... claimed ... noted ... </p>
In conclusion	<p> it should be said ... I should like to say ... it should be noted ... it should be commented on... I'd like to put forward ... </p>

Texts for Self-Study and Analysis

Text 1

The Early Days of Road Building

Road engineering is one of the earliest arts known to mankind. Road making originated in the period of early human settlements. People would choose the most convenient and the shortest ways of approach to their hunting and fishing grounds, gradually making footpaths. The earliest bridges were naturally fallen trees across waterways; gradually, however, crossings were built of logs. With the use of tamed animals for transport, the paths had to satisfy higher standards since bridle paths for pack animals must be cleared to a greater width and height.

The first artificially constructed tracks were made in mountainous and forested country, where obstacles to movement were encountered. It is likely that the first road surfacing was simply a layer of logs and brushwood over marshland.

About four to five thousand years B. C. the introduction of the wheel constituted a major technical achievement and greatly accelerated the development of road construction. The possibility of carrying a greater load on wheels than could be moved by dragging it, called for a corresponding improvement in carriageway and bridge flooring and also created a demand for more convenient road alignments and the bypassing of marshland and loose sands.

Road construction received a substantial impetus during the slave-owning period of the ancient world – in Assyria, Babylon, Persia and especially in the Roman Empire. This road building was maintained because of the continuous warfare with neighbouring states, which required roads to link the centre of the country with its borders. Thus, the transition from footpaths and bridge tracks to comparatively well-built roads was achieved largely through military considerations.

Commercial traffic at that time went mainly by sea and river. These routes were cheaper than transport by land and were safer. This situation was further accentuated by the territorial dissociation of the various states and the absence of an interconnected system of land communications. Therefore, during the whole of the slave-owning period, and later of the feudal epoch, water transport developed more quickly than overland transport. However, an appreciably well-developed road network was laid out in places where there were no waterways.

The construction of the stone arch bridge originated during the ancient Asiatic epoch. The earliest bridges had pointed arches, e.g., the ancient bridges of Persia, but later the Romans developed the semi-circular arch, which they used on bridges and viaducts.

In the ancient civilizations of the East artificially paved surfacings were used mainly for town streets and approaches to temples. Baked bricks were used extensively for paving in Assyria and Babylon, as well as mastic asphalt – a mixture of natural bitumen, clay, sand and gravel. Limestone slabs were also used for street pavement.

Text 2.**Roman Roads**

Road construction was extensively developed during the Roman Empire, the strategic and commercial aims of which required the creation of lines of communication cutting across Europe. The Roman historian Tacitus said that the roads of that time had been required by “the traders and the Roman army”, and the roads they had constructed were proof of the might of the Roman Empire. The Roman highway network, built during seven centuries, extended over a total length of 90,000 km, of which 14,000 km were situated within present-day Italy. If one is to take into account secondary earth and gravel roads, the total length of the Roman Empire road network would attain 300 thousand kilometres.

Carvings, reliefs, sculptures and paintings show us how the Romans travelled on land. Travellers described their journeys on these roads. Even the laws of Rome tell us about transport problems and how they were solved. According to Julius Caesar’s decree no person should be allowed to lead or drive a heavy wagon after sunrise or before the tenth hour of the day (when it was nearly dusk). No person should block a street, path or entrance with any construction which stopped people freely using those places. Only the rich could sleep in Rome. All night long wagons rumbled through the narrow winding streets. The way the drivers swore at traffic jams would have robbed even the heaviest sleepers of their rest.

Emperor Augustus kept in close touch with the provinces by relays of runners. These were strung out at short distances along the roads. Later on, he used chariots, based on posting stations (where the horses were changed).

The major Roman roads were of solid stone construction incorporating up to 10 to 15 thousand cubic metres of stone per kilometre. This is from 4 to 6 times the amount used today in the construction of modern motorways.

Materials used in the construction of Roman roads were gravel, cobblestone and hewn stone in the form of slabs. Lime burning was known to the Romans, who used concrete extensively for constructional purposes, employing as the matrix a mixture of lime, loose volcanic rock and sand.

The Romans were skilled in the art of bridge building as evidenced by their roads which were endowed with innumerable stone arch bridges whose remains can still be found in Italy, France and Spain.

As a rule, Roman roads were aligned to provide the most direct route ignoring natural obstacles. This policy necessitated the construction of numerous structures. For example, a depression 35 m deep was filled in along the Appian way near Terracina, whilst near Naples the Romans drove a tunnel 1,300 m long, 10 m high, and 8 m wide. At intervals of 10 to 15 km along these roads, inns were sited where about 40 horses were kept; by changing horses messengers were able to cover up to 150 km per day.

At the end of the fifth century the Roman Empire, weakened by the slave revolts, was conquered by the Germanic barbarians, and in its place appeared dozens of small feudal states. The European arterial roads, which now crossed several states, lost the importance they once held during the Roman era, and were allowed to fall into decay.

Text 3.

Road Building in the Period of the 18th and 19th Centuries

In the second half of the 18th century a period of intensive road building began, the rate of building being dependent upon the rate of development of industry and commerce in various states. The construction of roads with uniform hard surface substantially improved the conditions for the transportation of raw materials and of finished products by reducing the tractive resistance and hence allowing an increase in the load carried by individual vehicles.

At first, roads similar to the Roman roads were built. However, owing to a scarcity of suitable material and the high cost of labour, the amount of stone material used was progressively reduced, and the work was carried out less thoroughly. Research was undertaken with a view to finding more rational methods of using stone for pavement construction which would reduce both the amount of labour and the cost.

Important stages in the development of road pavement construction were marked by the introduction of two types of construction called by the names of their inventors – the Frenchman Tresquet and the Scot McAdam. Tresquet's system consisted in building the road pavement in a wide trench dug out of the natural ground. The bottom of the trench was given a camber in order to divert the water seeping from above. The pavement base was of uniform thickness for the whole width of the carriageway and consisted of slabs on end. The surface course was of crushed aggregate of the hardest rock. The stone pavement thickness was now reduced to 0.24 -0.27 m instead of 1 m as it was customary in Roman road construction.

McAdam proposed to build roads of a granular base 25 cm thick, which were to be compacted by the rolling carriages. The granular base was laid on a thoroughly leveled and compacted formation which ensured the elimination of water. McAdam was the first to observe that the strength of the pavement could be assured only when the subgrade resistance to loading was reliable.

Russian engineers were the first ones (1836) to construct granular surfacings laid on a sand base, which are now in fairly wide use in other countries. The use of a sand base permitted not only a reduction in the cost of construction, since much of the costly stone material was not required now, but also facilitated the removal of water from the subgrade. The latter increases subgrade stability and prevents the formation of frost heaves which are a specific phenomenon of pavements in spring, and are the result of excessive moisture content in the subgrade.

The construction of hard-surfaced roads led to the mechanization of transport, because horse-drawn transport could no longer cope with the increased goods traffic. In a number of countries attempts were made to introduce steam traction engines. However, because of the heavy weight of the steam engines, their imperfect construction and the lack of adaptability of roads for mechanical transportation, these efforts to introduce steam-driven vehicles onto highways were not successful at the beginning of the 19th century. The demand for transportation was satisfied by the construction of railways on a large scale, thus relegating the highways for horse transport to the secondary role of approach roads to the railway stations.

The type of road designed in the middle of the 19th century, with its granular surfacing, completely satisfied the requirements of horse transport. The engineering science and technique of granular surfacing had improved appreciably the practice of laying surfacings with a uniform grain size compacted by vehicles being gradually superseded by surfacing in which the granular material was blinded during rolling with loose fine stone aggregate – siftings and screenings. Mechanical stone crushing and steam rolling also came into use.

Text 4.

A Tale of Five Cities

For some people, the car is a convenient form of transportation. But for others, the car is an exciting hobby. Some people spend their lives collecting valuable cars. Others drive them in races. For many people, cars are more than transportation: they are a source of passion and pleasure. Yet cars can also be a source of many problems. There are millions of cars on the road today. How do cities cope with this?

Curitiba has very few traffic jams, even though it has more cars per person than any other Brazilian city except Brasilia. This is because the authorities have developed an efficient bus network to transport people rapidly around the city. Main roads have special lanes for buses only, so that they do not get caught in traffic jams. Services are regular and frequent, and it is quick and easy to switch from one bus route to another. Every two kilometres there are bus terminals equipped with newspaper stands, public telephones, post offices and shops. There is a fixed fare for all the journeys within the city. It is a simple, easy-to-understand system, and it works. Nearly 75 per cent of commuters in Curitiba travel by bus.

In Milan, cars need a permit to enter the city center. Only residents and some employers can obtain a permit, so very little traffic now drives in or out. Nearly everyone parks on the edge of the restricted area and heads for the center on foot. As a result, Milan now has many pedestrian-only shopping streets, and this has led to an increase in shopping in the city centre. Grass and trees have been planted, and many other improvements have also been made. The permit scheme is now recognized as a

great success. The scheme is unique to Milan, but it is thought that similar car bans will have spread to other Italian cities by the end of the decade.

The town of Delft in Holland has solved its traffic problems by encouraging people to cycle. In 1980, separate bike lanes were created on all major routes, as well as 12 kilometres of bike-only two-way streets, two special tunnels, and three new bridges for cyclists. Government rules require all shops to provide parking spaces for bicycles. Offices have to provide one secure bicycle space for every three employees, and each house must have a bicycle garage. In the first three years of operation, the average number of kilometres driven by car owners in Delft dropped by 6 per cent. In the rest of the country that number rose on average by 15 per cent. More than 50 per cent of all trips in Delft are now made by bicycle.

In Athens, car owners are only allowed to drive into the city centre every other day. They must match the final number of their car number plate to the day's date – if the date is an even number, and so is the final number of the number plate, then they can enter the inner-city area. The same goes for odd number plates and odd dates. This means that 50 per cent of all cars must stay at home each day. Pollution is measured every day, and when the levels of pollution get too high, all cars are banned from entering the city centre. However, as the new underground railway is completed and extended, it is hoped that soon more commuters will be traveling by Metro. If so, it may be possible to lift the present traffic restrictions.

Traffic jams and growing pollution in the historic German city Luneburg forced the local council to take action in 1990 to encourage people to leave their cars at home, regular fast public transport was introduced, and bicycle paths and wider pavements were built. The town centre became traffic-free, apart from cars for the disabled. A “park-and-ride” system offers a car park on the outskirts of the town, and a free bus service into the centre. There is also a place to leave shopping in the town centre, so people can walk around without their bags, and pick them up later.

Basic Reference

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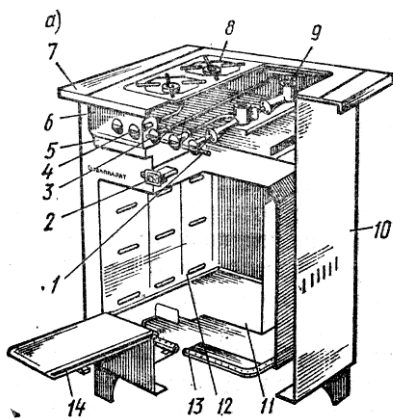
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Heating, Ventilation and Air Conditioning

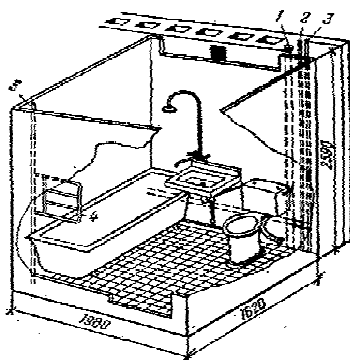
Speciality: Sanitary-Technical Engineering

Grammar: Tenses, Active and Passive Verb Forms. Single and Plural Nouns. Degrees of Comparison of Adjectives. Participle I and II. Gerund. Infinitive.

What do sanitary-technical engineers do?



Heating, ventilation, gas supply and air conditioning are the main basis of the engineering equipment of any building. All newly built houses are equipped with heating, ventilating, gas and hot water supply units. A civil engineer is to build blocks of flats and industrial enterprises more comfortable to live in and to work at. A sanitary-technical engineer is to design, to work out, to install and to improve the systems of heating, ventilating and air conditioning. His responsibility is to see that all these systems are kept in good order and are effectively working.



Cold and hot water supply systems are a part of the engineering equipment of any building. All newly built houses are equipped with water supply and water disposal systems. A water supply engineer is to design, to work out, to install and to improve the systems of water supply, water purification and sewerage. His responsibility is to see that all these systems are kept in good order and are effectively working.

Text A “Development of the Art of Heating”.**Vocabulary:**

1. to provide , v [prəˈvaɪd] –	обеспечивать
2. means , n [mi:nz] –	средство
3. artificial , a [ˈɑ:tɪˈfɪʃ(ə)l] –	искусственный
4. to rely on , v [rɪˈlaɪ] –	зависеть от
5. attempt , n [əˈtempt] –	попытка
6. to perform v [prəˈfɔ:m] –	создавать
7. chimney = flue, n [ˈtʃɪmni] –	дымоход
8. to convey , v [kənˈveɪ] –	передавать
9. draft , n [drɑ:ft] –	тяга, сквозняк
10. fireplace , n [ˈfaɪə-pleɪs] –	камин
11. heirloom , n [ˈeəlu:m] –	наследие
12. pier , n [pɪə] –	свая, дамба, столб
13. charcoal , n [ˈtʃɑ:kəʊl] –	древесный уголь
14. soot , n [su:t] –	сажа
15. furnace , n [ˈfə:nɪs] –	топка, печь
16. pipe , n [ˈpaɪp] –	труба
17. grille , n [grɪl] –	решетка
18. medium , n [ˈmi:djəm] –	носитель, посредник
19. to apply = to use, v [əˈplai] –	использовать
20. demand , n [dɪˈmɑ:nd] –	потребность
21. to wind away , v [waɪnd] –	выветривать

Task I. Read and translate text A: “Development of the Art of Heating”.**Text A “Development of the Art of Heating”.**

The question of providing, by artificial means, the necessary heat to keep our bodies in comfort has occupied the minds of human beings all through the ages. At the beginning man relied on the thermal radiation from the sun. He was sheltered in caves and huts during cold weather, clothing himself with the skins of animals, preventing his body from losing too much heat.

Then followed the discovery of making a fire, which was man's first attempt at artificial heating. This was first performed in the open air, but later in caves, where he lived and so provided artificial heat. Then smoke had to wind away out as best as it could. Later, an opening was formed in the roof through which the smoke could escape.

Then a chimney was formed for conveying the smoke and creating a draft which would draw away the smoke and gases. Our present open fireplaces and chimneys are heirlooms coming down from these age-old methods.

The Romans had a much better idea for artificial heating more than 2,000 years ago. Their method was to construct the floors of their buildings on a series of supporting piers. These piers were placed apart and the floor was supported by them just as concrete floors are supported by piers at the present time. The floor surfaces were usually covered with mosaic. The central fire was fed with charcoal to prevent accumulation of soot, and the hot gases traveled under the floor until they were led to a flue formed in the wall, where they were conducted to the atmosphere. There are the remains of the charcoal fire which went out nearly 1,500 years ago, when the Romans left England for their native soil.

For several centuries after the Roman system the development of the warm air furnace was carried out to convey the warm air from the outside of the furnace to the various rooms in the building.

The next step was to introduce the hot water boiler with a system of large pipes. The pipes were placed under or behind the grilles to give off heat in various rooms. Such a system of heating was installed in 1790 in the Bank of England. Gradually the importance of aesthetic considerations became manifest, and radiators were subsequently introduced to take place of pipes in the rooms. Steam was utilized and took its place with hot water as a medium for heating. Then came the demand, at the end of the 19-th century, for accelerated circulation of hot water and motor driven circulator and pumps were applied to heating. Early in the 20-th century came compact radiators. Later, concealed heaters were developed, although cast-iron coils were used. Then radiant heating was introduced and formed a very efficient heating system.

Exercise 1. Read the following international words and give their Russian equivalents:

Comfort, occupy, thermal radiation, to form, to convey, gas, method, the Romans, idea, to construct, a series, mosaic, central, accumulation, atmosphere, system, step, boiler, aesthetic, radiator, circulation, motor, compact, radiant, efficient.

Task II. Read the definition of the following words and word combinations and memorize them:

1. *thermal radiation* - тепловая радиация, т.е. передача тепла излучением;
2. *artificial heating* - искусственное отопление, т.е. обогрев здания с помощью специальной системы;
3. *a draft* - тяга, сквозняк, т.е. движение воздуха в помещении при открытом окне и двери;
4. *a supporting pier* - опорная свая, т.е. свая, на которую опирается перекрытие;
5. *to conduct to the atmosphere* - выводить (выбрасывать) в атмосферу, например, сажу или газы;
6. *flue = chimney* - дымоход, устройство, через которое газы и сажа выбрасываются в атмосферу;

7. *furnace* - топка, устройство, из которого теплый воздух подается в помещение;
 8. *hot water boiler* - котел с горячей водой, который используется для обогрева помещений;
 9. *heating* - отопление, т.е. обогрев;
 10 *cast-iron coils* - чугунные трубы, эти трубы используются в системах отопления.

Exercise 2. Fill in the blanks with the necessary words given below:

1. Heating prevents the body from . . . too much heat. 2. Making a fire was man's first . . . at artificial heating. 3. A chimney was formed for . . . the smoke. 4. The hot gases traveled to a . . . formed in the wall. 5. The next . . . was to introduce the hot water boiler. 6. The pipes were placed under 7. . . . took its place as a medium for heating. 8. Our present fireplaces are . . . coming from old methods. 9. The Romans had an idea of . . . heating 2,000 years ago. 10. Gradually the . . . of aesthetic considerations became manifest.

Steam, flue, grilles, losing, attempt, step, conveying, importance, artificial, heirlooms.

Exercise 3. Match the words from two columns:

- | | |
|-------------------|----------------|
| 1. discovery | a. соображение |
| 2. human being | b. века |
| 3. ages | c. отверстие |
| 4. cave | d. перекрытие |
| 5. opening | e. открытие |
| 6. support | f. ступень |
| 7. floor | g. пещера |
| 8. remains | h. человек |
| 9. step | i. опора |
| 10. consideration | j. остатки |

Exercise 4. Find in the text the verbs in the Past Simple Active and give their infinitives.

Example: relied – to rely
 asked – to ask

Exercise 5. Put the correct form of the verb given in brackets:

1. Comfort (to occupy) the minds of human beings all through the ages. 2. Man (to rely) on the thermal radiation from the sun. 3. Making a fire (to be) man's first attempt at artificial heating. 4. A chimney (to form) for conveying the smoke. 5. Concrete floors (to support) by piers. 6. There (to be) the remains of the charcoal

fire. **7.** Then (to come) the demand for circulation of hot water. **8.** Warm air furnace (to carry out) to convey the warm air. **9.** A system of heating (to install) in 1790. **10.** The pipes (to place) under the grilles next week.

Exercise 6. Form Gerund from the verbs:

Example: to provide – providing, to make – making

To open, to create, to give, to introduce, to warm, to convey, to carry, to cool, to clean.

Exercise 7. Translate the sentences and define the function of the Gerund.

1. The question of providing heat is very important.
2. Then followed the discovery of making a fire.
3. A chimney was formed for conveying the smoke and creating a draft.
4. The task of the open fire furnace is giving heat in the room.
5. Gas fires have been improved by introducing radiant elements.
6. Introducing this system has many advantages.
7. Air conditioning calls for mechanical cooling.
8. Air conditioning gives comfort to the people by providing fresh air.
9. There are different ways of transferring heat.
10. Warming buildings in winter is very important.

Exercise 8. Form degrees of comparison of the following adjectives.

Example: old – older – the oldest

important – more important – the most important

good – better – the best.

New, hot, cold, comfortable, nice, necessary, late, near, efficient, bad, wide, small, large, beautiful, great.

Exercise 9. Give the Plural form of the following nouns.

Example: book – books, man – men.

Hut, skin, cave, gas, roof, animal, body, method, car, woman, room, step, boiler, child, desk, pen.

Exercise 10. Translate into English:

1. В холодную погоду человек прятался в пещерах.
2. Позднее в крыше проделывалось отверстие для выхода дыма.
3. Римляне имели представление об искусственном отоплении 2000 лет тому назад.
4. Их метод – строить здание на опорных сваях.
5. В настоящее время бетонные перекрытия опираются на сваи.
6. Горячие газы выходили в дымоход.
7. В начале 20-го века появились компактные радиаторы.
8. Пол обычно покрывался мозаикой.
9. В будущем

системы отопления будут совершенствоваться. **10.** Пар и горячая вода используются как теплоносители.

Exercise 11. Answer the questions:

1. What question has occupied the minds of human beings all through the ages?
2. Where was man sheltered during cold weather?
3. What was man's first attempt at artificial heating?
4. Who had a much better idea for artificial heating?
5. How were the piers placed?
6. What were the floor surfaces covered with?
7. When did the Romans leave England for their native land?
8. Did radiant heating form a very efficient heating system?
9. Where were the piers placed?
10. When did compact radiators come?

Task III. Retell the text using the expressions:

Here are some words about, I'm going to speak about, thermal radiation, art of heating, making a fire, artificial heating, supporting piers, the Roman system, heaters, circulators, pumps, radiant heating.

Text B "Various Heating Systems".

Vocabulary:

- | | |
|---|-----------------------------|
| 1. direct , adj [dɪ'rekt] – | прямой, зд. местная система |
| 2. indirect , adj [ˌɪndɪ'rekt] – | центральная |
| 3. grate , n [greɪt] – | колосниковая решетка |
| 4. to direct , v [dɪ'rekt] – | направлять |
| 5. impracticable , adj [ɪm'præktɪkəbl̩] – | неприемлемый |
| 6. heater , n ['hi:tə] – | подогреватель |
| 7. essential , adj [ɪ'senʃ(ə)l] – | существенный, важный |
| 8. combustion chamber , n [kəm'bʌstʃn̩] – | камера сгорания |
| 9. cast-iron , adj ['kɑ:st'ɑɪən] – | чугунный |
| 10. duct = pipe = coil, n [dʌkt] – | труба |
| 11. expansion tank , n [ɪks'pæns(ə)n tæŋk] – | расширительный бак |
| 12. to emit = to radiate, v [ɪ'mɪt] – | излучать |
| 13. hammering , n ['hæməɪɪŋ] – | постукивание |
| 14. item , n ['aɪtem] – | элемент, продукт, статья |

Task I: Read and translate text B "Various Heating Systems".

Text B: "Various Heating Systems".

The number of different heating systems is almost unlimited. But all of them may be classified as "direct" or "indirect" systems. A "direct" system is a system in which the

fuel (or energy) is consumed in the room to be heated. An “indirect” system is one in which the energy is consumed outside the room to be heated. Open fires were the primitive source of heat.

Modern grates direct the hot gases to a firebrick back which radiates out into the room and have efficiencies of from 15 per cent to 20 per cent. The open fire in its best form has the advantages of giving ventilation and a center of interest in the room. Open fires are, of course, impracticable for buildings of any considerable size. Anthracite stoves in England and the large wood and coal stoves in many countries are more efficient. Their efficiency may be 50 per cent. However, they require labour for carrying fuel and ashes.

Gas fires have been greatly improved in recent years by introducing special forms of radiant elements. But gas heating will be much more expensive for continuous heating than coal. A direct electric heating is 100 per cent efficient. Electric radiators include heaters of different types and electric panels.

The culture of the Romans developed a type of heating which produced much the same effect as our radiant systems, by warming from a furnace in the basement. Recent excavations show that this form of central heating was an essential item of all the best houses of that time.

The method of warming buildings by direct fired furnaces is very ancient. The furnace usually consists of an inner box of iron or steel sheets. The bottom of the combustion chamber consists of cast-iron bars on which the fuel is burnt. Next to the warming of rooms by hot-air floor ducts practised by the Romans, hot-water circulation is the oldest artificial central-warming system, and is employed now. Hot-water system comprises a boiler or water heater, circulating pipes, radiators, or other heat-transmitting elements, feed and expansion tanks, and a cold feed pipe. There are steam systems subdivided in respect of pressure of operation, or temperature of emitting element. Steam system consists of an ordinary steam boiler connected to main piping serving radiators, coils, and convectors. The steam condenses in the various emitting elements and is returned by a system of return pipes to a vacuum pump. The water is returned to the boiler and the air is discharged to the atmosphere.

A disadvantage of this system is the noise or hammering, common to almost any steam system. All steam systems have low heat storage depending on the high velocity with which steam travels.

Exercise 1. Choose the necessary word from the two given in brackets:

1. Modern grates have (efficiencies, efficient) of 15 per cent.
2. The open fire has the (advantageous, advantages) of giving ventilation.
3. The system is a center of (interesting, interest) in the room.
4. Stoves (require, requirement) labour for carrying fuel and ashes.
5. Electric (radiators, radiation) include (heaters, heating) of different types.
6. The method of (warm, warming) buildings by furnace is very ancient.
7. The furnace (consists, consisting) of iron boxes.
8. The fuel is (burnt, burning).
9. Hot-air floor ducts were (practice, practised) by the Romans.
10. Hot-water circulation is the (old, oldest) of all warming systems.

Exercise 2. Give the definition of:

1. a direct system;
2. an indirect system;
3. open fires;
4. ancient method of heating;
5. the combustion chamber;
6. a steam system

Exercise 3. Express your agreement or disagreement with the statements:

1. Open fires are the best source of heat. 2. Hot-water circulation is the oldest central-warming system. 3. Steam systems are subdivided in respect of pressure. 4. The water is not returned to the boiler. 5. The advantage of this system is the noise. 6. Noise is common to almost any steam system. 7. Gas fires have been improved by radiant elements. 8. Gas heating is not used for continuous heating. 9. The culture of England developed heating. 10. The steam condenses in the emitting elements.

Exercise 4. Form Participles I and II.

Example: to translate – translating – translated

To occupy, to prevent, to perform, to convey, to support, to write, to lead, to ask, to make, to become, to put, to give.

Exercise 5. Translate the sentences and define the functions of Participle I and II in the sentences:

1. The chimneys are coming down from age-old methods.
2. Then came the demand for accelerated circulation.
3. Man was sheltered in caves, clothing himself with the skins of animals, preventing his body from cold.
4. Later concealed heaters were developed.
5. Hot water system comprises circulating pipes and heat-transmitting elements.
6. When heated this substance will raise its temperature.
7. While making experiments they obtained unexpected results.
8. Air conditioning is finding its application in industry.
9. While reading a new text students wrote out some unknown words.
10. Gas-fired furnaces have been improved in recent years.

Exercise 6. Form the Adverbs from the Adjectives.

Example: great – greatly, main – mainly.

New, effective, artificial, usual, near, general, natural, gradual, direct, considerable, recent, large, high, loose, mechanical, even, essential, wide, extensive, wide.

Exercise 7. Put all possible questions to the sentences:

1. The number of heating systems is almost unlimited.
2. The energy is consumed outside the room.
3. Gas fires have been improved in recent years.
4. People are using various heating systems in their homes.
5. The Romans developed central heating.
6. A hot-water system comprises a boiler and pipes.

Exercise 8. Give synonyms to the words and word combinations.

Example: small – little

Great, important, to occur, a human being, heating, to provide, to produce, output, a series of, at the present time, several, various.

Exercise 9. Answer the questions:

1. How may heating systems be divided?
2. What is a direct system?
3. What is an indirect system?
4. What advantages has the open fire?
5. What stoves are efficient?
6. What do electric radiators include?
7. What method is very ancient?
8. Who were hot-air floor ducts practised by?
9. Where does the steam condense?
10. Is there any disadvantage in steam systems?

Exercise 10. Speak about Heating Systems using key-words and word combinations:

to classify, to consume, heated, central heating, direct, indirect, electric heating, hot-water system, gas fires, radiant elements.

Text C “Air Conditioning”**Vocabulary:**

1. **term**, n [tə:m] – термин
2. **air conditioning**, n [' эə kən ' dɪʃ(ə)nɪŋ] – кондиционирование воздуха
3. **to involve** = to include = to comprise, v [ɪn ' vɔɪv] – включать

4. **apart from** = in addition to, prep [ə'pɑ:t frɒm] – кроме
5. **to call for** = to require, v [kɔ:l]– требовать
6. **accurate**, adj ['ækjʊrɪt] – точный
7. **to cater for** = to supply = to provide, v ['keɪtə] – обеспечивать
8. **distribution**, n [ˈdɪstrɪ'bjuːʃn] – распределение

Task I. Read and translate text C “Air Conditioning”.

Text C: “Air Conditioning”.

1. The term air-conditioning is often used loosely to describe any ventilation system with fan and heater.

2. True air-conditioning is the provision of means for control of temperature, humidity and purity of ventilation air both in summer and winter, and involves not only means for warming and humidifying in winter, but also for cooling and dehumidifying in summer. The latter calls for mechanical cooling.

3. Essential to any air-conditioning system are the controls without which satisfactory results are unobtainable.

Apart from comfort, air-conditioning is finding an ever widening application in industry, where the accurate control of atmospheric conditions may be essential for process work. Air conditioning for human comfort gives comfort to the people, by providing air of predetermined temperature and moisture content.

4. Air-conditioning systems vary in complexity and cost, according to conditions required and the degree of accuracy of control.

Small offices may be catered for by unit conditioners, with the cooling unit at a distance or incorporated in the cabinet.

5. More extensive and complex systems are involved when a multistor office block, factory, cinema or theatre is to be air-conditioned. The plant would comprise: large cooling compressor with cooling water supply; air washer and dehumidifier; heater batteries; filters; fan; automatic controls with provision for change-over from winter to summer operation; insulation of ducts; silencing arrangements, and so on.

6. Air distribution, with full air-conditioning, needs great care. The downward system is often to be preferred because the cooled air naturally tends to drop after entering.

Exercise 1. Find the English equivalents in the above text to the following Russian words and word combinations:

Свободно, вентилятор, подогреватель, обеспечение, влажность, чистота, способ, охлаждение, увлажнение, осушение, находить применение, промышленный

процесс, кондиционер, установка, многоэтажный, переход, внимание, стремиться.

Task II. Find the number of the paragraph in which the true Air Conditioning is described.

Task III. Look through the text and find the information about:

1. Air distribution. 2. Complex air conditioning systems. 3. Fields of application for air conditioning systems.

Task IV. Point out the main sentence of each paragraph and write them down.

Task V. Express your agreement or disagreement with the following statement. Write down your own variant.

Air conditioning systems are the same for all purposes.

Task VI. Write your own variant of the summary of the text.

Exercise 2. Combine pairs of antonyms.

Example: small – large

Hot, high, new, industrial, low, domestic, heating, efficient, dry, to ask, increase, to switch on, output, inlet, clean, down, outlet, dirty, purification, up, contamination, input, to switch off, cooling, cold, old, inefficient, wet, to answer, decrease.

Exercise 3. Translate into Russian paying attention to modal verbs and their equivalents:

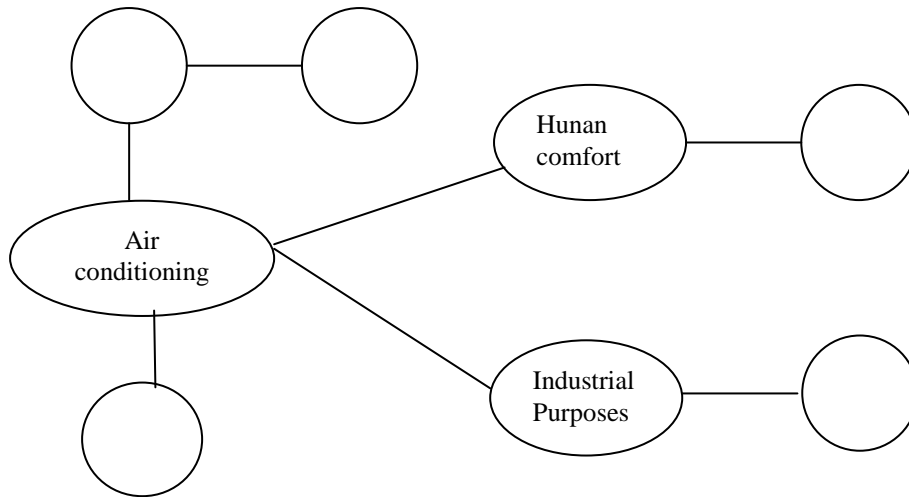
1. Heating systems may be classified as direct and indirect systems.
2. The design of heating and ventilation must be treated separately.
3. Heating and ventilation should be considered together.
4. The engineer had to change the plan.
5. This system might be the most effective of the three.
6. Steam heating systems can be designed by different companies.

Exercise 4. Define the functions of the Infinitive in the sentences:

1. Smoke had to wind away out.
2. Their method was to construct buildings on piers.
3. The development of warm air furnace was carried out to convey the warm air to the rooms.

4. The fuel is consumed in the room to be heated.
5. To consume the fuel we must know its characteristics.
6. To design new systems is the noble task of engineers.
7. Radiators were introduced to take place of pipes.
8. This system is often to be preferred.
9. A civil engineer builds new blocks of flats more comfortable to live in.
10. The system to be installed in the house has many advantages.

Exercise 5. Build up the scheme.



Water Supply and Water Disposal

Speciality: Sanitary-Technical Engineering

Grammar: Tenses, Active and Passive Verb Forms. Single and Plural Nouns. Degrees of Comparison of Adjectives. Participle I and II. Gerund. Infinitive.

Text A “Water Cycle”.

Vocabulary:

- | | |
|---|-------------------------|
| 1. to treat , v [tri:t] – | рассматривать, изучать |
| 2. occurrence , n [ə'kʌrens] – | распространение |
| 3. precipitation , n [pri,sɪpɪ'teɪʃ(ə)n] – | осадок |
| 4. transpiration , n [,trɒnspraɪ'reɪʃn] – | испарение, выделение |
| 5. evaporation , n [ɪvæpə'reɪʃ(ə)n] – | испарение, выпаривание |
| 6. to be concerned with , v [kən'sə:n] – | заниматься |
| 7. to impound , v [ɪm'paund] – | запруживать воду |
| 8. well , n ['wel] – | колодец |
| 9. to estimate , v [ˈestɪmeɪt] – | вычислять, подсчитывать |
| 10. bulk , n ['bʌlk] – | масса, объем |
| 11. droplet , n ['drɒplɪt] – | капелька |
| 12. to soak up , v [sauk] – | впитывать(ся) |
| 13. to swell (swoll-swollen), v [ˈswel] – | увеличиваться, набухать |
| 14. to store (up), v [ˈstɔː] – | откладывать, хранить |
| 15. occasional , a [ə'keɪʒ(ə)nəl] – | случайный, редкий |

Task I. Read the following international words and give their Russian equivalents:

Hydrology, ground, mineral, globe, atmosphere, mass, cycle, to condense, to form, sanitary engineer, ocean, period, to act, oases, natural.

Task II. Read and translate text A “Water Cycle”.

Text A: “Water Cycle”.

Hydrology is the science which treats the water of the earth and its occurrence as rain, snow and other precipitation. It includes study of the movement of water on the

surface and underground to the sea, transpiration from vegetation, and evaporation from land and water surfaces back to the atmosphere.

The sanitary engineer is concerned with hydrology since water supplies are taken from streams, impounding reservoirs, and wells which are fed by precipitation.

Three fourths of the surface of the earth is covered with water. It has been estimated that the amount of water on the surface of the earth is many thousands of billions of tons.

The bulk of this water is in the ocean. It contains a great deal of dissolved minerals.

Under the warming influence of the sun all the water on the surface of the globe is evaporated each year. All this disappears into the constantly moving air as water vapour.

When a mass of warm air strikes a colder mass of air, the vapour condenses out as droplets of liquid water which we see as clouds, or fog.

Under certain conditions these droplets join together to form raindrops which fall to the earth.

Hence all the water has come from ocean. The total amount of water on the earth never changes. It merely changes its form and moves from place to place.

As the rain falls, some of the water is soaked up by the ground, and some of it runs off immediately. Water always tends to run downhill, it finds its way to larger streams, to rivers or lakes, and finally back to the ocean.

Thus, water is continually going round and round the circle of ocean, clouds, small streams, rivers, lakes and oceans. It has been doing this for millions of years.

Of course, all of the water does not run directly back to the ocean after it falls as rain. Some of it stays under the ground for long periods of time. Some is evaporated from the small streams, rivers, and lakes to become water vapour to swell the local clouds. Plants take up an enormous quantity, most of which evaporates through the leaves.

The soil acts as an enormous storage place for water. The underground layers of clay or sand and the cracks in the rocks store up great quantities of water.

All of this will go back to the ocean. It is thought that some of this water has been under the ground for thousands of years, and may even have come down as rainfall before human history began.

This ground water is the source of supply for the springs and for the wells we dig. Even the middle of the Sahara is not without water for there are occasional oases where the layer of underground water comes to the surface in natural springs or in man-made wells.

Exercise 1. Read the definitions of the following words and word combinations and memorize them:

- | | |
|----------------------|---|
| 1. hydrology | — гидрология – наука, которая изучает движение воды |
| 2. sanitary engineer | — инженер, который занимается вопросами водоснабжения и водоотведения |

- | | | |
|-------------------------------------|---|---|
| 3. to go round and round the circle | – | проходить по кругу |
| 4. storage place | – | хранилище; место, где хранится вода |
| 5. human history | – | история человечества |
| 6. ground water | – | грунтовая вода; вода, содержащаяся в верхнем слое почвы |
| 7. occasional oases | – | редкие оазисы, встречающиеся в пустыне |

Exercise 2. Fill in the blanks with the words given below:

1. Hydrology . . . the water of the earth. 2. The . . . engineer is concerned with hydrology. 3. Three fourths of the earth is covered with . . . 4. We see . . . of liquid water as clouds, or fog. 5. The soil . . . as an enormous storage place for water. 6. This . . . water is the source of supply for springs. 7. In the middle of the Sahara there are occasional . . . 8. Water . . . from place to place. 9. All the water has come from . . . 10. This ground water is the . . . of supply for the wells.

Oases, ground, acts, water, treats, sanitary, droplets, oceans, source, moves.

Exercise 3. Match the words from two columns:

- | | |
|-----------------|-------------------|
| 1. vegetation | a. набухать |
| 2. bulk | b. определенный |
| 3. vapour | c. поток |
| 4. certain | d. масса |
| 5. raindrops | e. испарять |
| 6. stream | f. земля |
| 7. circle | g. растительность |
| 8. to swell | h. круг |
| 9. to evaporate | i. дождевые капли |
| 10. globe | j. пар |

Exercise 4. Define the tense and the voice of the verbs in the following sentences. Give their infinitives:

Example: works – Pr. Simple Active, to work

1. Hydrology includes study of the water movement. 2. The sanitary engineer is concerned with hydrology. 3. Water has come from oceans. 4. Water is continually going round and round the circle. 5. The water on the surface was evaporated. 6. For millions of years rivers have been pouring into the ocean. 7. All the water will not run directly to the ocean. 8. The soil acted as an enormous storage place for water. 9. Water finds its way to the rivers. 10. Much water will be taken up by the plants.

Exercise 5. Put the correct form of the verb in the following sentences:

1. Pure water (to contain) dissolved minerals. 2. All the water (to evaporate) each year. 3. All the water (to go) back to the ocean next week. 4. Look! Droplets (to form) raindrops. 5. Some water (to soak) up by the ground. 6. The rain (to stop) already. 7. Water always (to tend) to run downhill. 8. Water (to go) continually round and round the circle. 9. Water (to form) clouds soon. 10. The students (to discuss) the problems of water supply for 2 lessons.

Exercise 6. Give the Plural form of the nouns.

Example: science – sciences, student – students.

Rain, precipitation, movement, surface, sea, land, engineer, stream, well, mineral, year, droplet, cloud, condition, raindrop, ocean, form, place, woman, child, river, lake, period, rock, crack, source, spring, layer.

Exercise 7. Give the Possessive Pronouns corresponding to the personal ones.

Example: I – my.

He, she, it, we, you, they.

Exercise 8. Translate the sentences into Russian paying attention to Modal verbs and their equivalents:

1. Water may require treatment for a number of reasons.
2. Water must be free from odors.
3. Water should be suitable for cooking.
4. Water may contain disease bacteria.
5. Hydrogen sulphide must be removed.
6. This plant can effectively purify water.
7. Water may contain minerals.
8. Our engineer could help you yesterday.
9. He had to change his method of work.
10. We shall be able to go to the cinema tomorrow.

Exercise 9. Form Participle I and II.

Example: to destroy – destroying – destroyed.
to come – coming – come

To treat, to include, to study, to concern, to cover, to make, to write, to read, to fall, to go, to become, to dig.

Exercise 10. Translate the sentences and define the functions of Participles I and II in the sentences:

1. The sanitary engineer is concerned with hydrology.
2. Water is continually going round the circle.
3. While evaporating water swells the clouds.
4. If heated water becomes vapour.
5. The earliest written records of water purification date to 2000 B.C.
6. Under the warming influence of the sun water is continually evaporating.
7. The amount of water has been estimated.
8. Water has been doing this for millions of years.

Exercise 11. Translate into English:

1. Вода испаряется с земли в атмосферу. 2. Количество воды на Земле уже подсчитано. 3. Основная масса воды находится в океанах. 4. Мы видим капельки воды в виде облака или тумана. 5. Вода всегда стремится спуститься с горы. 6. Растения впитывают много воды. 7. Гидрология изучает воду Земли. 8. 3/4 поверхности Земли покрыто водой. 9. Подсчитано, что воды на Земле миллиарды тонн.

Exercise 12. Answer the questions:

1. What does hydrology study?
2. Why does ocean water contain salt and other mineral materials?
3. What amount of water is evaporated from the surface of the earth every year?
4. Where is water stored in nature?
5. How does water get to the oceans?
6. What is the total amount of water on the Earth?
7. Where is water evaporated into?
8. Has all water come from oceans?
9. Is there water in Sahara?
10. What circle is water continually going?

Text B: "Treatment of Water".

Vocabulary:

- | | |
|--|----------------------|
| 1. treatment , n [ˈtri:tment] – | обработка |
| 2. germ , n [dʒə:m] – | микроб |
| 3. suitable , a [ˈsju:təbl] – | пригодный |
| 4. plain sedimentation , n [ˈsedɪməntɪʃn] – | простое осаждение |
| 5. sedimentation , n [ˈsedɪməntɪʃn] – | осаждение |
| 6. settling tank , n [ˈsɛtliŋ ˈtæŋk] – | бак для осаждения |
| 7. removal , n [rɪˈmu:v(ə)l] – | удаление |
| 8. softening , n [sɒfniŋ] – | умягчение, смягчение |
| 9. to contaminate , v [kənˈtæmɪneɪt] – | загрязнять |

10. purification , n [ˌpjuərəɪfɪˈkeɪʃ(ə)n] –	очистка
11. storage , n [ˈstɔːrɪdʒ] –	хранение
12. to clarify = to purify, v [ˈklærɪfaɪ] –	очищать
13. vessel , n [ˈvesl] –	сосуд
14. aqueduct , n [ˈækwɪdʌkt] –	акведук, водовод
15. exposure , n [ɪksˈpəʊʒə] –	выставление

Task I: Read the following international words and give their Russian equivalents:

Reason, industrial, method, basin, reservoirs, efficient, chemical, coagulant, coagulation, adequate, production, filter, filtration, disinfection, bacteria, chlorine, form, aeration, activated, correction, practical, nature, corrosive, fact, practice, sulphide, to recommend, apparatus, era, porous, detailed, system, interest.

Task II. Read and translate text B: “Treatment of Water”.

Text B: “Treatment of Water”.

Water may require treatment for a number of reasons. The most important is the necessity of removing the germs of disease. Water must be free from unpleasant tastes and odors and also have an inviting appearance. It should be suitable for cooking and washing and also usable for industrial purposes.

A number of treatment methods have been developed to meet these necessities of the modern community. Storage of water in basins and reservoirs and plain sedimentation are used, although they have largely given way to more efficient methods.

Sedimentation is obtained by use of chemicals as coagulants. Settling velocities of particles are small. Removing them in a settling tank is impossible under ordinary conditions. It has been necessary to devise means to coagulate the very small particles into larger ones. This is done by adding to the water certain chemicals known as coagulants.

Sedimentation, with or without coagulation, will not give adequate treatment to water. The production of clear water requires the use of a filter. Filtration through sand aids in the removal of colour, tastes, odors, iron.

Disinfection of water is the killing of disease bacteria that it may contain. Chlorine, in its various forms, is almost universally used in disinfecting water. It is cheap, reliable, and presents no great difficulty in handling.

Aeration, certain chemical treatments, or activated carbon will reduce or prevent taste and odors. Softening the water, removal of iron, and correction of excessive corrosiveness are all practical treatment methods which are being employed to supply pure water.

The character and degree of treatment required will depend upon the nature of the water, and this will depend upon its source.

Surface waters are dangerously contaminated and more or less turbid. They will need coagulation, sedimentation, filtration and disinfection.

Cities that obtain relatively clear water from lakes or reservoirs depend upon disinfection.

Ground waters are usually clear and therefore do not require filtration. They are likely to require iron removal, softening, or correction of corrosiveness. Some ground waters contain the odorous hydrogen sulphide which must be removed.

Here are some interesting facts from the early practice of water treatment.

The earliest written records of water purification date to 2000 B. C. Storage of water in copper vessels exposure to sunlight and filtering through charcoal were recommended as was boiling of “foul water”.

Pictures on the walls of Egyptian tombs show the first apparatus for clarifying water.

The art of obtaining potable water was not unknown to the ancient Chinese people. Centuries before our era, the Chinese are reported to have had wells. They also employed alum to clarify muddy river water centuries ago.

Aristotle in the 4-th century B. C. mentioned filtration through porous vessels; Hippocrates, the “Father of Medicine” wrote on the relation of water to health and disease.

The first water engineer of Rome wrote the first description of a water-works system. Of particular interest is his description of a settling reservoir at one of the aqueducts.

Exercise 1. Choose the necessary word from the two given in brackets:

1. Water may (require, requirement) treatment for a number of reasons. 2. It must be (freedom, free) from odours. 3. It should be suitable for (cook, cooking) and (wash, washing) . 4. (Storage, store) of water in basins is (use, used). 5. Sedimentation will not give (adequate, adequately) (treat, treatment) to water. 6. (Sedimentation, sediment) is obtained by (chemical, chemicals) as coagulants. 7. (Settle, settling) velocities of (part, particles) are small. 8. The (product, production) of (clear, clearance) water requires the (used, use) of a filter. 9. Sand aids in the (removal, remove) of colour and tastes. 10. Disinfection is the (kill, killing) of disease bacteria.

Exercise 2. Give the definition of:

- a. sedimentation
- b. filtration
- c. disinfection of water
- d. aeration of water
- e. surface waters
- f. ground waters
- g. coagulation

Exercise 3. Express your agreement or disagreement with the statements:

1. Water must be free from unpleasant tastes and odors. 2. Water may not have an inviting appearance. 3. One method has been developed to meet the necessities of the

modern community. 4. Filtration aids in the removal of colour, tastes and odours. 5. Sedimentation will give adequate treatment to water. 6. Chlorine is used in disinfecting water. 7. Aristotle mentioned relation of water to health. 8. The first water engineer of Rome wrote the description of a water system. 9. Aeration water treatment will depend upon its nature.

Exercise 4. Form the Gerund from the verbs.

Example: to make – making, to transfer – transferring.

To remove, to meet, to use, to coagulate, to add, to clarify, to produce, to give, to provide, to clean.

Exercise 5. Define the functions of the Gerund in the sentences:

1. The most important is the necessity of removing germs of disease.
2. Treatment methods have been developed for meeting people demands.
3. Sedimentation is obtained by using chemicals as coagulants.
4. Removing small particles is impossible under ordinary conditions.
5. This is done by adding to the water certain coagulants.
6. Chlorine is used in disinfecting water.
7. The art of obtaining potable water was known to Chinese people.
8. The task of water systems is supplying portable water.
9. There are different ways of clarifying water.
10. Settling impurities is a problem in water treatment.

Exercise 6. Form Degrees of Comparison of Adjectives.

Example: large – larger – the largest, beautiful – more beautiful – the most beautiful.

Important, pleasant, suitable, small, clear, clean, cheap, great, reliable, bad, safe, hard, light, easy, hot.

Exercise 7. Put all possible questions to the sentences:

1. Water may require treatment.
2. Treatment methods have been developed for purifying water.
3. Sedimentation is obtained by use of coagulants.

Exercise 8. Answer the questions:

1. Why may water require treatment?
2. What must water be free from?
3. What methods of treating water do you know?
4. What will treatment depend upon?

5. What do pictures on the walls of Egyptian tombs show?
6. Was the art of obtaining potable water known to the ancient Chinese people?
7. Who mentioned filtration in the 4th century B.C.?
8. What did the first water engineer of Rome write?

Exercise 9. Speak about treatment of water using key-words and word combinations:

to require, to remove germs, to be suitable for, to develop, to meet the necessities of the community, efficient methods, settling, sedimentation, disinfection of water, softening of water, surface waters, ground waters, interesting facts.

Text C “Purification of Water Supply”.

Vocabulary:

- | | |
|--|----------------------------|
| 1. water supply , n [ˈwɔ:tə səˈplaɪ] – | водоснабжение |
| 2. essential = important, a [ɪˈsenʃ(ə)l] – | важный, существенный |
| 3. suspended , past. p [səsˈpendɪd] – | взвешенный |
| 4. to eliminate = to remove, v [ɪˈlɪmɪneɪt] – | удалять |
| 5. as well as , con. [ˈæz ˈwel ˈæz] – | также как, а также |
| 6. to sustain , v [səsˈteɪn] – | поддерживать |
| 7. to fit , v [fɪt] – | подходить, соответствовать |
| 8. to stress , v [stres] – | подчеркивать |
| 9. wholesome , a [ˈhəʊlsəm] – | полезный, благотворный |

Task I. Read and translate text C “Purification of Water Supply”.

Text C: “Purification of Water Supply”.

At present the problem of water supply and treatment are the most essential for mankind. Water taken from natural sources such as rivers and lakes often requires purification.

Water may contain bacteria, mineral elements, suspended matters and impurities. Some of these impurities may be removed easily, others require complex treatment.

Some mineral elements are removed by aerating water. The suspended materials require coagulation and settling process. Bacteria are eliminated from water with the addition of chemicals and sand filtration.

The purpose of purifying drinking water is to make it more pleasant and more wholesome to drink. It's necessary to make it more acceptable to the senses of taste, smell and sight.

By rendering water hygienically safe for drinking purposes, sickness and death as well as economic losses, are avoided.

Water is industry's life flood. Just as water within a human body sustains life, water in industry maintains the product line – it is at various times a catalyst, chemical, lubricant, conveyor, coolant, binder or cleanser.

It should be said that for industrial purposes many waters are entirely unfitted for use without purification. The softening of hard waters is a method of purification which has long been practised. In many industries the bacterial content of the water is of some importance.

People will learn to use the practically inexhaustible water of the seas and oceans. Right now there are dozens of methods for the desalination of sea water, including one using atomic energy.

In conclusion it should be stressed that with the growth of population many modern treatment systems have been built and much more is still to be done in this field.

Exercise 1. Translate the sentences and define the functions of the Infinitive in the sentences:

1. Water may contain bacteria.
2. The purpose of purifying water is to make it pleasant to drink.
3. It's necessary to make it more acceptable by taste, smell and sight.
4. To soften hard waters means to purify them.
5. Much work is to be done in this field.
6. Impurities must be removed to make water clean.
7. To translate the text students must know new words.
8. The method to be used to purify water is very effective.
9. People will learn to use water of the seas and oceans.
10. Much more is still to be done in this field.

Exercise 2. Combine pairs of antonyms.

Example: small – large.

Little, contamination, day, easy, light, warming, to give, any, small, purification, night, difficult, much, purification, night, large, dark, frosting, to take, no.

Exercise 3. Form adverbs from adjectives.

Example: large – largely.

Main, efficient, essential, recent, simple, easy, hygienic, probable, practical, respectful.

Exercise 4. Change the Infinitive into the Gerund.

Example: To soften water means to purify it.

Softening water means purifying it.

1. To purify water is to make it pleasant to drink.
2. Impurities must be removed to make water clean.
3. To translate the text we must know words.
4. To smoke is dangerous for health.
5. This method is effective to purify water.
6. To read is necessary.
7. Our task is to retell this text.
8. Our duty is to study well.
9. The text to be translated at home is not difficult.

Exercise 5. Put all possible questions to the sentences:

1. People will learn to use the sea water.
2. Many treatment systems have been built.
3. Water is everywhere.
4. Many problems are avoided by proper treatment of water.
5. People are using water for various purposes.

Exercise 6. Find the English equivalents in the above text to the following Russian words and word combinations:

Обработка, очистка, человечество, источник, вещество, примеси, осаждение, устранять, питьевая вода, приемлемый, безопасный, катализатор, смазка, охладитель, жесткая вода, неистощимый, обессоливание.

Task II. Find the number of the paragraph in which the purpose of purifying drinking water is described.

Task III. Look through the text and find the information about:

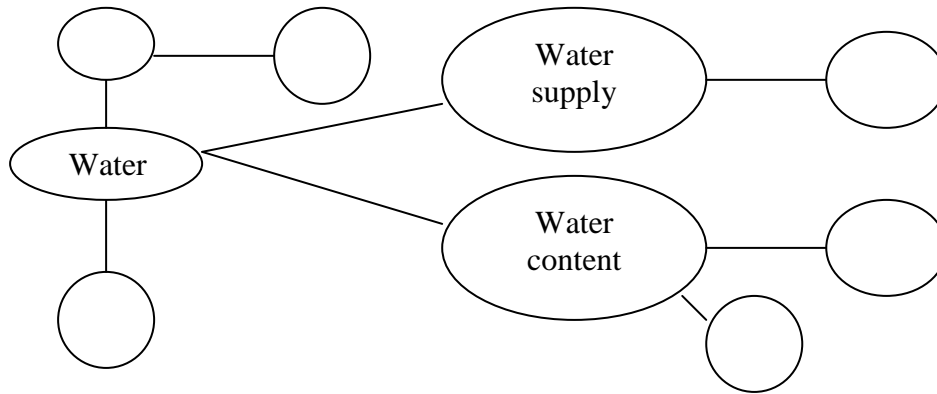
1. Water content.
2. The purpose of purifying drinking water.
3. Inexhaustible water sources.

Task IV. Point out the main sentence of each paragraph and write them down.

Task V. Express your agreement or disagreement with the following statement. Write down your variant.

Natural water sources require purification.

Task VI. Write your own variant of the summary of the text.

Exercise VII. Build up the scheme.

Texts for Self-Study and Analysis

How Water Circulates Throughout the World

Water must be readily available to support life and its activities. At first thought it may seem that water is always available, since the Earth is literally surrounded by water. At times, up to 4 percent of the atmosphere near ground level is water vapor. Also, many thousands of lakes, rivers, and streams are scattered over the Earth's surface. The vast oceans, almost an unending source of water, cover some 140,500,000 square miles and contain almost 330,000,000 cubic miles of water. Yet, with all this water, there are parts of the Earth that are scorched and arid. The manner in which water circulates between Earth and atmosphere determines where ample water supplies can be found and used.

The Water Cycle

If no forces except gravity were at work, the world's water would settle into the ocean basins and remain there. The land surfaces would become lifeless deserts. Water, however, does not stagnate in the oceans. It is continually evaporated from the oceans and other bodies of water by the heat of the sun and blown by the winds across sea and land. Thus, an immense amount of water is always suspended in the atmosphere in the form of vapor. When certain weather conditions prevail in the atmosphere, some of the water vapor forms clouds. When such clouds accumulate more water vapor than they can hold, the water is returned to the land as rain or snow (see Cloud; Rainfall; Snow). This process of moving water out of the oceans, into the atmosphere, and back to the land and oceans is called the water cycle, or hydrologic cycle.

Sun, air, water, and the force of gravity work together to keep the water cycle going. Major steps in the cycle include: the evaporation of water by the sun's heat and the transpiration of water by plants; the condensation of water vapor by cold air; the precipitation of water by gravity; and the return of water by gravity to the oceans. Some water evaporates into the air from rivers, lakes, moist soil, and plants, but most of the water that moves over the surface of the Earth comes from the oceans and eventually returns to the oceans.

Hard Water

In some areas extra soap is needed for washing objects such as clothing because the water is hard. Hard water contains certain dissolved minerals, such as calcium bicarbonate, magnesium bicarbonate, and calcium sulfate, which make it difficult for soap to lather.

One method of softening water, the lime-soda process, takes the hardening materials out of the water. Lime (an oxide of calcium) and soda ash (a salt of carbonic acid) are added to the water. They combine with the hardening materials to form compounds that

precipitate, such as calcium carbonate. Another method, the cation-exchange, or zeolite, process, also chemically changes the water-hardening materials. Hard water runs into a tank of zeolite, a mineral that contains sodium ions (electrically charged particles). These ions change places with calcium or magnesium ions, forming sodium compounds that do not harden water. Brine, which contains sodium and chlorine ions, is then pumped into the zeolite to replace lost sodium ions. The calcium and magnesium ions are freed and combine with the chlorine ions to form chlorides, which are drained off.

Surface Water and Groundwater

The soil covering the Earth acts as a giant sieve. Soil particles have tiny spaces between them that allow water to trickle down into the soil. When a heavy rainfall occurs, these tiny spaces in soil quickly fill with water, and the excess water, called surface water, runs over the top of the soil. Such surface runoff flows as a thin, hardly noticeable sheet of water until it reaches a depression in the land, such as a gutter or a streambed, where the water can be contained. There, it no longer flows as a sheet of water but as a clear-cut channel of water, moving downward to the ocean.

Water that infiltrates the soil trickles slowly downward, or percolates, through pores and cracks in soil and rocks. Rock strata, or layers, and soil capable of holding water are called aquifers. Eventually, the water reaches a level where it can go no farther because bedrock forms a base. As more and more water accumulates, the aquifer becomes saturated (filled) with water and cannot hold any more. Water held in aquifers is called groundwater. The depth at which groundwater is found varies because the hard bedrock base exists at varying levels. Groundwater is a major source of fresh water. Scientists estimate that there may be enough groundwater in North America to cover the continent with a sheet of water almost 100 feet (30 meters) thick. By means of wells, humans bring this water to the surface to satisfy their need for water. Some of the groundwater moves toward the surface of the soil by capillary action and is evaporated into the air. Plants draw their water from ground so moistened. Water is drawn through the roots of a plant to its leaves, from which it evaporates. This process is called transpiration (see Plant). A fully grown oak tree may transpire about 100 gallons (380 liters) of water a day. In summer an acre of corn transpires from 3,000 to 4,000 gallons (11,360 to 15,140 liters) of water each day.

The Water Table

The topmost level of groundwater is called the water table; below this level the soil is waterlogged. If a hole is dug deep enough in the soil, it may reach the water table. The water table is not at the same level everywhere. It may be close to the surface in some places and hundreds of feet beneath the soil in others. Sometimes a deep cut in the land will expose the water table. Then the groundwater runs off as a stream or river.

Changes in climatic conditions and in the amount of precipitation used by vegetation may cause the water table to rise or fall. Heavy rainfall can raise the water table. If the

level becomes too high, damage can occur to plants. During times of sparse rainfall, the soil becomes extremely dry, and groundwater that seeps to the surface and evaporates is not replaced. The water table then becomes lower. If much of the lost water is not soon replaced, a drought may occur.

Water that is drawn from wells may affect the level of the water table in a given area. When ground water is pumped to the surface, the water level in the well becomes slightly lower than the surrounding water table. Groundwater then flows downward to the level of water in the well, causing a cone of depression in the water table. This lowers the water table slightly. If water is rapidly drawn from a number of wells in the same area, the water table may be lowered considerably. The water table may rise again when sufficient rainfall occurs or when there is a decrease in the amount of water taken from wells.

Sewage Treatment

Sewage systems collect wastewater and treat it before discharging it back into the environment. These systems consist of intricate networks of underground conduits, or sewers, which convey the sewage through the treatment process to the point of disposal.

Sewage systems also handle the flow of rainwater, either separately or as a part of a single system. Separate systems are generally preferable because, in single systems, heavy rainfall can overload treatment plants, with the result that untreated overflow can become a source of pollution. In separate systems, rainwater is often allowed to flow into streams untreated because it is assumed to be relatively clean.

Sewage is processed in three major steps, called primary, secondary, and tertiary treatments. Most areas do not use all three, and different areas use the treatments in different ways.

Primary Treatment

The initial, and sometimes the only, method of cleaning wastewater is primary treatment, which consists of removing floating chunks and fine particles of solid waste. The simplest form of primary treatment is a cesspool, now found primarily in rural areas. A cesspool is a big tank with a porous bottom and sides that lets the liquid wastewater filter into the ground while holding the solid waste. Periodically the tank must be cleaned; the solid matter, called sludge, is sometimes used for fertilizer or landfill. Septic systems are somewhat similar, though the tank is connected to a drainage field so that more waste can be dispersed over a wider area.

In larger communities, sewer water passes first through a screen, which filters out the larger debris. It then runs through a grit chamber, a long, shallow trough with a dip in the bottom that acts like a trap. As water moves through the trough, small, hard

materials in the water drift down to the bottom and fall into the trap. Grease floats to the surface and is skimmed off. The trap, like a cesspool, is periodically scraped clean.

After going through the screen and grit chamber, the sewage still contains small suspended solids—about 1 ton per million gallons (3,790,000 liters) of wastewater. To remove some of these, the sewage is trickled into a sedimentation tank, or settling basin. The water enters through a pipe, then circulates slowly while the suspended particles settle to the floor. The top layer of water continually runs out through exit holes.

The sludge from sedimentation tanks may be sent through a tank called a digester, where bacteria digest it, producing carbon dioxide and methane gas and other by-products. Any combustible gases may then be collected and used to heat the digestion tanks and buildings and to fuel gas engines in the plant. The sludge may also be buried or dumped as landfill, burned, or dried in sludge drying beds for use as fertilizer.

Primary treatment removes about half of the suspended solids and bacteria in sewage and about 30 percent of the organic wastes. Sometimes chlorine gas is added to the effluent (the liquid remaining after sedimentation) to kill most of the remaining bacteria. Some cities use chemicals that coagulate some of the solids into particles of a size and weight that will settle, so that they can be separated in a settling tank. The use of chemicals makes it possible to remove 80 to 90 percent of the suspended solids.

History

The use of specially constructed sewers dates to the time of Babylon and ancient Greece, but only during the 19th and 20th centuries was the water-carriage sewage system adopted in the Western world. In these early systems, streams often served the dual purpose of sewage disposal and water supply, and hence there were frequent, disastrous epidemics of cholera, typhoid fever, and other waterborne diseases. The most effective methods of sewage treatment were not developed until the second quarter of the 20th century. Today, because of the greater amount of sewage from growing populations and industrial activity, there is an unprecedented quantity of legislation designed to control water pollution. As a result, scientist and engineers continually search for methods to further increase the levels of sewage treatment.

Secondary treatment

Today, large cities are usually required to put their wastes through both primary and secondary treatment because primary treatment alone removes so little organic material. Secondary treatment uses aerobic, or oxygen-breathing, bacteria to decompose organic wastes. The main object is to put the wastewater in contact with as many bacteria as possible while keeping it aerated so that the bacteria have an adequate supply of dissolved oxygen.

One of the most common secondary treatments of this type is the activated-sludge method, so called because it uses sludge that is activated, or teeming with microorganisms. After going through primary treatment, the sewage is put into the activated-sludge tank, where it is aerated by pumps or blasts of compressed air. The compounds produced by the bacteria remain mostly suspended in the water and flow out with it into a secondary sedimentation tank.

The sludge from the bottom of the tank is handled in much the same way as the sludge from the primary sedimentation tank, except that about a quarter of it is recirculated back into the activated-sludge tank. This recirculation serves to seed the activated-sludge tank with fresh bacteria. The activated-sludge method permits almost any desired degree of treatment by varying the period of aeration. It removes about 95 percent of bacteria and more than 90 percent of suspended solids and organic matter.

Another method of secondary treatment is the trickling-filter method. Generally, rotating arms slowly spray the sewage over a shallow circular tank containing a layer of gravel or crushed rock. The rocks are covered with a slimy coating of microorganisms that break down the organic wastes in the sewage. After this process, as in the activated-sludge method, the water that has been filtered is passed into a secondary sedimentation tank for removal of organic matter that has sloughed off from the stones of the filter. Trickling filters, together with primary treatment and final sedimentation will remove most suspended solids.

Tertiary treatment

Wastewater that has received primary and secondary treatment still contains dissolved materials that make it unsuitable for almost all uses except irrigation. Tertiary treatments, which depend largely on artificial chemical processes, are designed to remove these materials in order to make the effluent safer to discharge into waterways and safer for industry to use. A number of methods may be used, including radiation treatment, discharging the effluent into lagoons, and chlorination.

Sewage may also be passed through filters made of activated carbon, which consists of finely ground charcoal grains with rough, pitted surfaces that trap impurities. Alternatively, sewage may be strained through a screen made of tiny seashells called diatomaceous earth. The effluent may also be treated with chemicals that transform the dissolved organic material. Some chemical compounds, for example, combine with the nitrates in sewage to produce various salts. Such treatments are expensive, however, and are difficult to perform routinely.

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Unit IX

Fire Safety in Building

Speciality:	Fire Safety in Building
Grammar:	Modal verbs. Suffixes.
	Passive voice. Infinitive.
	-ing forms. -to forms. Participle I. Gerund

What Do Fire Prevention Engineers Do?

The profession of a fire prevention engineer is very important. He must coordinate and ensure the fire safety at the planning stage of a new building. It includes the following fire prevention procedures:

- to deal with the suitability of various building materials for fire protection;
 - to appreciate the possible restraints that fire resistance requirements may place upon the materials;
 - to recommend the installation of fire resisting structures where it is necessary;
 - to assess what degree of fire protection is desirable;
 - to control the sub-division of industrial buildings into the smallest practicable - departments;
 - to occupy premises according to their function and capacity;
 - to ensure non-obstructed escape routes if the fire occurs;
 - to provide fire protection and fire warning systems;
 - to equip the building with the automatic relief vents.
- Fire protection should balance with the requirements of modern construction.

Text A. “Basic Principles of Fire Protection and Design Against Fire”.

Vocabulary

1. internal [In'tɪq:nl], adj -	внутренний
2. external [eks'tɪq:nl], adj -	внешний
3. adjoining [q'GOInIN], adj -	смежный
4. danger ['deInGq], n -	опасность
5. damage ['dxmIG], n -	ущерб, вред
6. set out , v -	излагать
7. withstand [wID'stxnd], v -	противостоять
8. safety ['seIfɪtI], n -	безопасность
9. requirement [rI'kwɑIqmɒnt], n -	требование
10. presuppose [prI:sq'pqʊz], v -	предполагать
11. limitation [ˈlɪmɪ'teɪʃn], n - (-s)	ограничения
12. occupancy ['Okjʊpənsɪ], n -	назначение
13. impose [Im'pouz], v -	накладывать
14. supporting [sq'pLɪtɪn], adj -	поддерживающий
15. suitably ['sju:təblɪ], adv -	надлежащим образом
16. protected [prq'tektɪd], pp -	защищенный
17. combustible [kqm'bʌstɪbl], adj -	горючий
18. ensure [In'Suq], v -	обеспечивать
19. contribute [kqn'trɪbjʊ:t], v -	способствовать
20. deflection [dɪ'flekʃn], n -	отклонение
21. provision [prq'vɪʒn], n -	условие
22. arson ['a:sn], n -	поджог
23. premises ['premɪsɪz], n -	помещение
24. fit [fɪt], v -	оборудовать
25. maintain [meɪn'teɪn], v -	обслуживать
26. install [In'stɪl], v -	устанавливать
27. warn [wɜ:n], v -	предупреждать
28. safeguard ['seɪfgɑ:d], v -	охранять

Task I. Read and translate text A “Basic Principles of Fire Protection and Design Against Fire”.

8.1 Text A: “Basic Principles of Fire Protection and Design Against Fire”.

Fire hazard in buildings may be divided into internal, in the building itself, and external, arising from a fire in an adjoining property. The internal hazard may be subdivided into danger to occupants of the building and damage to structure and contents.

The basic principles of fire protection may be set out under three broad headings: Every building should be designed and constructed to reduce the risk of ignition of any part of the building and the spread of fire inside the building, or into or out of it.

The parts of the building are required to withstand the effects of fire long enough to avoid any structural collapse that would increase the risk of fire spread.

Building regulations deal with the certain requirements for the structure, the nature of the materials used and the surface finishes of the building structure as a whole. It presupposes the following: 1) limitations are placed upon size, depending upon occupancy; 2) a period of fire resistance is imposed on any supporting structure; 3) all openings, both horizontally and vertically, must be adequately and suitably protected; 4) limitations are imposed upon the nature and amount of combustible material used both for wall and ceiling finishes; 5) controls on width, number and disposition of exits, both horizontally and vertically, to ensure safe evacuation of a building are imposed.

The fire safety problem concerns with the passive and active fire precautions.

Passive precautions must be considered at an early stage of the building design process. There are some essential principles of fire design:

- the building should be constructed from building materials that will not contribute to the spread of fire;
- structural collapse and excessive deflection should be prevented;
- the building should be constructed in such a manner that, if a fire starts, the extent of fire and smoke damage will be minimized;
- there should be adequate provision to prevent an arson attack;
- the building should be so constructed that fire cannot spread into the premises from an adjoining building or other external fire source;
- the building should be fitted with an appropriate automatic fire-alarm system;
- the fire- protection systems should be regularly maintained so that they are able to perform their function throughout the life of the building;
- all fire-protection systems should be installed by adequately trained specialists;
- any fuel-burning appliance and electrical equipment should be designed, constructed and installed in a manner that reduces its potential as an accidental source of ignition.

On the other hand, active fire precautions represent an often necessary addition to the services of a building, such as the installation of alarms and detectors to give a warning of an outbreak of fire, the installation of equipment for automatic extinction, and the provision of first-aid fire fighting equipment.

Fire safety engineer should consider some building regulations and requirements related to fire precautions from the early planning stage right through to the ultimate occupation of the building. He has two duties: to protect the lives and to safeguard property within the building.

Task 1. Read the definitions of the following words and word-combinations and memorize them:

fire hazard –	пожарная опасность, риск возникновения пожара;
fire protection -	противопожарная защита;
ignition –	зажигание, загорание, воспламенение;
fire spread –	распространение огня;
structural collapse –	обрушение конструкции, структурное разрушение;
building regulations –	строительные нормы и правила, СНиП;
fire resistance –	пожароустойчивость;
safe evacuation –	безопасная эвакуация;
fire precautions -	меры предосторожности от пожара;
fire design -	конструкция, защищающая от пожара;
fire source –	источник возникновения пожара;
fire alarm -	сигнал пожарной тревоги, тревожная сигнализация;
fuel-burning appliance	– приспособление, работающее на сжигаемом топливе (горючем);
heat detector –	тепловой пожарный извещатель; прибор, чувствительный к повышению температуры окружающей среды;
smoke detector –	дымовой пожарный извещатель; прибор, реагирующий на наличие дыма;
outbreak of fire -	вспышка пожара, его внезапное начало;
first-aid fire fighting equipment	– комплект для оказания первой медицинской помощи при борьбе с пожаром;
extinction –	тушение

Exercise 2. Use the given words and put them in the blanks:

Extinction, safeguard, surface finishes, detectors, fire hazard, fire alarm, outbreak of fire, fire precautions, prevent, contents, maintained, combustible materials, withstand, reduce.

1. ... in buildings may be divided into internal and external.
2. The fire safety problem concerns with the passive and active
3. The building should be fitted with an appropriate automatic ... system.
4. Active fire precautions represent the installation of ... to give a warning of an ... of fire, and equipment for automatic
5. Fire safety engineer should be responsible for the lives and must ... property.
6. Building regulations deal with the requirements for the structure, the nature of the materials used and the
7. There should be adequate provision to ... an arson attack.
8. The internal hazard presupposes the danger to occupants and damage to structure and
9. The parts of the building are required to ... the effects of fire long enough.
10. Building requirements presuppose limitations of ... used for finishes.
11. The fire protection systems should be regularly ... to be able to perform their function.
12. Any electrical equipment should be designed to ... the risk of fire.

Exercise 3. Match the words from two columns:

- | | |
|--------------------------------|--|
| 1. surface finishes | а) поддерживающая конструкция; |
| 2. supporting structure | б) гарантировать безопасную эвакуацию; |
| | в) автоматическая система оповещения о пожаре; |
| 4. excessive deflection | г) внешняя отделка; |
| 5. automatic fire alarm system | д) горючий материал; |
| 6. fuel-burning appliance | е) чрезмерное отклонение; |
| 7. to ensure safe evacuation | ж) приспособление, работающее на сжигаемом топливе |

Exercise 4. Find the modal verbs in the text. Pay special attention to their forms and using. Example:

1. Fire hazard in buildings may be divided ...
2. All fire protection systems should be regularly maintained ...
3. Passive precautions must be considered ...
4. The doctor recommended I should see a specialist.
5. I must phone her tonight.

Exercise 5. Choose the correct modal verb:

1. можно разделить на (must, may) be subdivided to
2. следует спроектировать так (should, can) be designed
3. нужно защитить надлежащим образом (may, must) be suitably protected
4. следует строить таким образом (may, should) be constructed in such a manner
5. должны учитываться (must, can) be considered
6. следует устанавливать (should, must) be installed
7. могут быть изложены (must, may) be set out

Exercise 6. Replace the equivalent with the proper modal verb given below:

1. Fire hazard in buildings is allowed to be divided into internal and external.
2. All openings are to be adequately and suitably protected.
3. Passive precautions have to be considered at an early stage of the building design.
4. The basic principles of fire protection are allowed to be set out under three broad headings.
5. Fire is able to reach a temperature of 600 degrees C.
6. Electrical equipment has to be designed and installed to reduce an accidental ignition.
7. Fire resistant suspended ceilings are also able to protect steel beams.

a) must; b) can; c) may; d) must; e) must; f) may; g) can

Exercise 7. Choose the correct translation of the following phrases:

1. He is known to compare these dimensions...
 - a) Он знает, что сравнивать эти размеры...
 - b) Сравнивая эти размеры, он узнает...
 - c) Известно, что он сравнивает эти размеры...
2. The problem to be solved was of great importance.
 - a) Представляется важным решить проблему.
 - b) Проблема, которую нужно решить, представляет большую значимость.
 - c) Решенная проблема весьма важна.
3. The students have a lot of work to do.
 - a) Студенты выполнили большой объем работ.
 - b) У студентов много работы.
 - c) Студентам нужно выполнить большой объем работ.
4. He came to make some experiments.
 - a) Он пришел и проводит опыты.
 - b) Он пришел, чтобы провести опыты.
 - c) Он пришел для проведения опытов.

Exercise 8. Translate the following sentences paying attention to to-forms.

1. Every building should be constructed to reduce the risk of ignition.
2. The parts of the building are required to withstand the effects of fire long enough to avoid any structural collapse.
3. Building regulations presuppose controls on width, number and disposition of exits to ensure safe evacuation.
4. The fire-protection systems should be able to perform their function throughout the life of the building.
5. Fire safety engineer has to protect the lives and to safeguard property.
6. A lot of fire resistant materials are being developed to improve fire protection in buildings.
7. In order to understand the meaning of fire resistance...

Exercise 9. Translate the following sentences into English:

1. Риск возникновения пожара в зданиях можно разделить на внутренний и внешний.
2. Каждое здание должно быть сконструировано таким образом, чтобы снизить риск возгорания какой-либо части строения.
3. Строительные нормы и правила предъявляют определенные требования к конструкции, природе используемых материалов и внешней отделке здания.
4. Проблема пожарной безопасности затрагивает пассивные и активные меры предосторожности от пожара.
5. Требования, предъявляемые к конструкции, предполагают наличие определенного количества выходов для обеспечения безопасной эвакуации.

6. Системы противопожарной защиты должны устанавливаться подготовленными специалистами.
7. Инженеру пожарной безопасности следует принимать во внимание строительные нормы и требования, начиная с момента планирования здания вплоть до его окончательной сдачи.
8. Строительные требования предполагают определенные ограничения в использовании возгораемых материалов для отделки стен и потолков.
9. Одним из существенных принципов пожароустойчивой конструкции является соответствующая эксплуатация противопожарных систем.

Exercise 10. Answer the following questions, using the following expressions: as far as I know, as I remember, in my opinion, if I'm not mistaken.

1. How is fire hazard in buildings divided?
2. What does the internal hazard mean?
3. What are the basic principles of fire protection?
4. What are the parts of the building required to withstand the effects of fire for?
5. What requirements do building regulations deal with?
6. What are limitations placed upon?
7. When must passive precautions be considered?
8. What do they presuppose?
9. The building should be fitted with an appropriate automatic fire-alarm system, shouldn't it?
10. How are active fire precautions represented?
11. What are the duties of fire safety engineer?
12. When should he consider some building regulations and requirements?
13. What should the fire protection systems be regularly maintained for?

Text B. "Fire Requirements to the Building Materials".

Vocabulary

- | | |
|---|------------------------|
| 1. durable ['djuqrqbl], adj - | прочный |
| 2. fire-resistant ['faIq rI 'zIstqnt], adj - | пжароустойчивый |
| 3. steel [stJl], n - | сталь |
| 4. concrete ['kOnkrJt], n - | бетон |
| 5. brick [brIk], n - | кирпич |
| 6. decay [dI 'keI], v - | разлагаться |
| 7. sound insulation - | звукоизоляция |
| 8. heat insulation - | теплоизоляция |
| 9. steelwork ['stJlwq:k] - | стальная конструкция |
| 10. thickness ['TIknIs], n - | толщина |
| 11. expose [Iks 'pquz], v - | подвергать, выставлять |
| 12. aggregate ['xgrIgIt], n - | заполнитель |

13. lightweight ['lQItweIt], adj -	легковесный
14. loadbearing ['lqud,bFqrIN], adj -	несущий нагрузку
15. pulverized fuel ash -	размельченная зола сгоревшего топлива
16. tile [tQIl], n -	плитка
17. gypsum ['GIpsqm], n -	гипс
18. plaster ['plRstq], n -	штукатурка
19. flame-retardant [fleIm rI'tRdqnt], adj -	пламезамедляющий
20. partition [pR'tISqn], n -	перегородка
21. clay [kleI], n -	глина
23. sand lime -	песчаный известняк
24. reinforced concrete -	железобетон
25. wood wool slab -	ДВП
26. floor [flL], n -	перекрытие
27. roof [rHf], n -	крыша
28. joist [GOIst], n -	балка, брус
29. incorporate [In'kLpqreIt], v -	включать
30. suspended [sqs'pendId], pp -	подвешенный
31. beam [bJm], n -	перекладина
32. shutter ['SA tq], n -	затворка
33. subject [sqbGqkt], v -	подвергать
34. property ['prOpqtI], n -	свойство
35. measure ['meZq], v -	измерять
36. severity [sI'verItI], n -	жесткость
37. failure ['feIljq], n -	повреждение
38. appreciate [q'prJSIeIt], v -	оценить
39. initiate [I'nISIeIt], v -	брать начало

Task I. Read and translate text B “Fire Requirements to the Building Materials”.

8.2 Text B: “Fire Requirements to the Building Materials”.

Nowadays a lot of *fire resistant materials* and articles are being developed in the laboratories to improve fire protection in buildings. Materials that are used for structural purposes should meet *several requirements*. In most cases it is important that they should be hard, durable, fire-resistant.

The most commonly used materials are steel, concrete, stone, wood and brick. They differ in hardness, durability and fire-resistance.

Wood is the most ancient structural material. It is light, cheap and easy to work but wood has *certain disadvantages*: it burns and decays.

Stone belongs to one of the oldest building materials used by man. It has mechanical strength, compactness, sound and heat insulation and fire-resistance.

Steel is *non-combustible* but it does not withstand the temperature above 550 degrees C and a fire can reach a temperature of 600 degrees C within a few minutes of its outbreak. *The protection of structural steelwork* is of prime importance in building construction. Steel can be protected in variety of ways. It can be encased in brickwork or concrete, or protected by the application of sprayed asbestos or vermiculite.

Timber of sufficient thickness is *capable of withstanding fire* for a longer period than unprotected steel under similar conditions.

The ability of concrete *to resist damage* when exposed to high temperatures depends largely upon the properties of its aggregate.

Thermalite lightweight load bearing insulating building blocks manufactured from cement, sand and pulverized fuel ash are incombustible and have good thermal insulation properties. The blocks can be used in external walls, interior and partition walls.

Such *incombustible products* as ceiling tiles made of reinforced gypsum plaster can give 1 hr fire protection.

Fire-retardant emulsion paint and flame-retardant treatment for timber are developed *to prevent spread of flame*.

For walls and partitions traditional materials such as solid bricks of clay, concrete or sand lime, solid concrete blocks or reinforced concrete give a range of *fire resistance* depending on thickness and finish. Wood wool slabs also afford protection, plastered on both sides to a specified thickness.

Floors and roofs can be of concrete or timber construction. Forms of construction include reinforced concrete slabs. Timber joist construction can incorporate plasterboard, asbestos insulation board, wood wool slabs and a variety of other materials in the ceilings to give *the required degree of fire resistance*. Fire resistant suspended ceilings can also be used to protect steel beams.

An essential element in the design of fire-resisting structures is *the adequate protection* of all openings in walls and floors. In industrial buildings doors and archways should be fitted with fire-resisting doors or shutters.

The fire safety engineer must achieve the maximum safety to the occupants and the minimal structural damage to the fabric of the building, if a fire occurs. All structural materials should *be subjected to the tests* consisting of some items: non-combustibility and ignitability of materials, fire propagation of materials, surface spread of flame, fire resistance for the elements of structure.

The term “fire resistance” is a property of a complete structural element and not of an individual material. Fire resistance is measured by the length of time an element of structure will resist a fire of a prescribed severity without failure. In order to understand the meaning of fire resistance in relation to fire technology, it is important that the influence of high temperatures on such basic materials as steel and concrete should be fully appreciated. Only by acquiring such a knowledge can the engineer design a structure which will meet the *fire resistance design criteria*.

The coordinated policy of fire prevention is initiated at the planning stage of new buildings and maintained in use.

Exercise 1. Choose the correct word from the two words given in brackets:

1. Materials used for structural purposes should be hard, durable and (fire-resistant, combustible).
2. (Wood, steel) can be encased in brickwork or concrete or protected by the application of sprayed asbestos.
3. The ability of (plastic, concrete) to resist fire damage depends upon the properties of its properties.
4. Incombustible ceiling tiles are made of reinforced (gypsum plaster, timber).
5. All structural materials should be tested for (ignitibility, waterproofness).
6. Insulating building blocks can be used in (roofs, interior walls).
7. Floors and roofs can be of concrete or (steel, timber) construction.
8. The co-ordinated policy of fire prevention is initiated at the (final, planning) stage of new buildings.
9. The most commonly used material is (brick, plastics).
10. Steel does not withstand the temperature above (five hundred and fifty, two hundred and fifty) degrees C.
11. To understand the meaning of fire resistance it is important to appreciate the influence of high (loads, temperatures) on steel and concrete.

Exercise 2. Match the words and their definitions:

- | | |
|------------------------------|---|
| 1. sound and heat insulation | a) dealing with the fire defense, decreasing the burning time; |
| 2. incombustibility | b) the movement of flame away from the ignition source; |
| 3. flame-retardant | c) the ability to resist effects of sound and heat; |
| 4. fire propagation | d) the changes to building due to the effect of fire; |
| 5. reinforced concrete | e) the property of withstanding high temperatures for a long period of time; |
| 6. structural fire damage | f) concrete forced with iron rods; |
| 7. durability | g) the property of any mechanism or material to work and serve quite a long time; |
| 8. joist construction | h) the construction which includes all kinds of materials to ensure fire protection |

Exercise 3. Choose and insert the correct form from given in brackets:

1. Many fire resistant articles (are being developed, develop, is developed) in the laboratories.

2. Materials that (is used, are used, are using) for structural purposes should meet several requirements.
3. Fire-retardant emulsion paints (are developed, developed, develop) to prevent spread of flame.
4. Fire resistance (is measured, are measured, measures) by the length of time an element of structure will resist a fire.
5. Incombustible ceiling tiles (make, are made, are making) of reinforced gypsum plaster.
6. Fire resistant suspended ceilings (are used, used, are using) to protect steel beams.
7. The policy of fire prevention (are initiated, initiate, are initiating) at the planning stage of new buildings.

Exercise 4. Choose the correct translation of the underlined words:

- | | |
|---|---------------------------------------|
| 1. A lot of fire resistant materials | a) разрабатываются; |
| <u>are being developed</u> in the laboratories. | б) разрабатывают; |
| 2. Fire resistant suspended ceilings | в) разработано. |
| <u>are used</u> to protect steel beams. | а) использованы; |
| 3. The maximum safety to the occupants <u>will be achieved</u> only | б) будут использованы; |
| with the co-ordinated policy of fire prevention. | в) используются. |
| 4. Insulating building blocks <u>were being manufactured</u> from | а) будет достигнута; б) достигнута; |
| cement, sand and pulverized fuel ash. | в) достигает. |
| 5. All structural materials <u>are subjected</u> to the tests. | а) производятся; б) производились; |
| 6. Fire resistance <u>is measured</u> by the length of time an element of | в) были произведены. |
| structure will resist a fire. | а) подвергаются; б) будут подвержены; |
| | в) были подвержены |
| | а) измеряет; б) была измерена; |
| | в) измеряется. |

Exercise 5. Translate the following sentences paying attention to the tense and voice :

1. Fire resistant materials and articles are being developed in the laboratories to improve fire protection in buildings.
2. Fire-retardant emulsion paint and flame-retardant treatment for timber are developed to prevent spread of flame.
3. Fire resistance is measured by the length of time an element of structure will resist a fire without failure.
4. The co-ordinated policy of fire prevention is initiated at the planning stage of new buildings.

5. Fire resistant suspended ceilings are used to protect steel beams.

Exercise 6. True or False:

1. Structural materials are quite similar in their properties.
2. Steel can withstand the temperature nearly 800 degrees C.
3. We may ignore the influence of high temperatures on steel and concrete.
4. Lightweight loadbearing insulating blocks can be used in external walls.
5. All structural materials should be subjected to the tests.
6. Wood wool slabs plastered on both sides give the required protection.
7. The adequate protection of all openings is not an important element.
8. Materials used for structural purposes should meet several requirements.
9. Wood hasn't got any disadvantages.
10. Ceiling tiles made of reinforced gypsum plaster can't give the adequate fire protection.

Task II. Using the information of the text, characterize:

- fire requirements to the building materials;
- some advantages and disadvantages of building materials;
- the measures to ensure fire safety;
- new incombustible building materials;
- the concept of fire resistance.

Exercise 8. Put the missing words into the text:

Structural materials should be (hard, soft, wood). Wood has certain disadvantages: it (sinks, burns, warms up). Steel is protected by (concrete, timber, plastics). Building blocks made of cement, sand and pulverized fuel ash are (flammable, suspended, incombustible). They can be used in (ceilings, floors, roofs). The adequate protection of all openings in (windows, walls, beams) is an essential element in the design of fire resisting structures. The influence of (water, cold weather, high temperatures) on steel and concrete should be appreciated.

Exercise 9. Work in pairs using the following word-combinations: *do you know, do you remember, as far as I know (remember), if I'm not mistaken.*

Find out:

1. what properties of building materials should be;
2. what materials are used in building construction;
3. what newly-developed incombustible products you know;
4. how the novelties are applied in construction;
5. what the term 'fire resistance' means;
6. if all materials are suitable without additional treatment;
7. what fire requirements to the structures are;
8. why wood is considered an appropriate building material;
9. what the fire safety engineer deals with.

Exercise 10. Speak about fire requirements to the building materials using key words and word combinations:

Fire resistant materials, several requirements, properties of building materials, certain disadvantages, non-combustible, fire protection of steel, capable of withstanding fire, to resist damage, newly-developed incombustible products, to prevent spread of flame, application of structural materials, the required degree of fire resistance, the adequate protection, be subjected to the tests, fire resistance design criteria.

TEXT C. Sources of Ignition and Fire Prevention Measures.

Vocabulary

1. **conflagration** [kɒnflə'greɪʃən], n – большой пожар
2. **disaster** [dɪ'zɑːstə], n – бедствие
3. **cause** [kɔːz], v – вызывать
4. **loss** [lɒs], n – потеря
5. **vehicle manufacturing** ['vɜːklɪ]- автомобильное производство
6. **equipment** [ɪ'kwɪpmənt], n – оборудование
7. **explosive** [ɪks'plɒsɪv], adj – взрывоопасный
8. **flammable** ['flæməbl], adj – воспламеняющийся
9. **explosion-proof** [ɪks'plɒzən,pruːf], adj – взрывозащищенный
10. **arc** [ɑːk], n – дуга
11. **spark** [spɑːk], n – искра
12. **emergency call panel** – панель аварийной сигнализации
13. **revenge** [rɪ'veɪʒ], n – месть
14. **conceal** [kən'seɪl], v – скрывать
15. **perpetrator** ['pɜːpɪtreɪtə], n – нарушитель
16. **remotely** [rɪ'moʊtli], adv – дистанционно
17. **monitored** ['mɒnɪtəd], pp – управляемый
18. **self-contained** [selfkən'teɪnd], adj – автономный
19. **frailty** ['freɪlti], n – ненадежность
20. **procedure** [prə'sɜːdʒə], n – мероприятие
21. **supervision** [sʌpə'vɪʒən], n – наблюдение
22. **alteration** [ˈlɪtə'reɪʃən], n – перемена, изменение
23. **bear in mind** – иметь в виду
24. **sprinkler system** - разбрызгивающая система
25. **insurer** [ɪn'sʊərə], n – страховщик
26. **reduce** [rɪ'dʒʊs], v – уменьшать, сокращать
27. **give warning** – предупредить

Task I. Read and translate the text “Sources of Ignition and Fire Prevention Measures”.

1. The pages of history are full of conflagrations and disasters caused by fire. The efforts to protect property and prevent fires were made in Rome in about 300 BC.

2. Speaking about industry, the study of large fires reveals that premises engaged in engineering and electrical goods manufacture are responsible for nearly 15 percent of the total losses from large fires. The damage from the fires in the vehicle manufacturing industry is not very essential, but the most frequent outbreaks occur in the chemical industry. Where the source of a large fire could be determined, in more than one third of outbreaks the location was a store, stockroom, warehouse or similar area. Electrical equipment is a potential source of ignition of explosive atmospheres in areas where industrial operations involve flammable liquids and gases, if certain safeguards are not employed. The electrical equipment should be located in non-hazardous areas. Its explosion-proof construction should prevent electrical arcs or sparks from igniting surrounding explosive atmosphere.

3. The catastrophic fires also can be residential and nonstructural ones. Almost 60 percent of the residential fires occurred in the houses that had no detectors. In other cases the detectors operated and sent signals to emergency call panel, but the fire caused a death because of the smoke spreading throughout the building. Some of the fires are started by the children playing with matches. Statistics says that 40 percent of office fires are started by employees by bringing in kettles or toasters.

4. In many cases arson accounts for a high proportion of fires. The reasons for arson are many and varied. It may simply be mindless vandalism, playing with fire, revenge or an attempt to conceal a crime. Whatever the motive, if undetected, the perpetrators may attempt to set fire to combustible materials lying around the outside of a building, or try to gain access to the building where the consequences of their actions could be even more damaging.

5. But technological advances, particularly over the last 10 years, now mean that protection against the threat of criminal attack, and specifically arson, can be provided by remotely monitored systems, 24 hours a day. This is especially important when a location is unmanned overnight or at weekends, requiring effective cover to be maintained. Such systems are able to take advantage of standard cameras to act as the 'detectors' with detection zones placed anywhere within a specific camera view on or around the items or areas to be protected. The cameras are then linked to a self-contained processing system capable of using video content analysis. With the most recent systems, it is perfectly possible to differentiate between steam and smoke based on images alone.

6. While a large number of fires are attributable to human frailty a great deal more can be done in 'building-in' fire protection at the design stage. The co-ordination of fire prevention procedure is essential and should include a review of production and structural fire risks, fire alarm and fire fighting procedure and the supervision of

alterations to plant and buildings where fire risks could arise. The fire prevention engineer has some major points to bear in mind when dealing with large buildings: design requirements for fire safety, fire resistance and reliability of structural materials, suitable protection of the personnel or occupants, the building itself and the equipment.

7. Sprinkler systems are regarded by the insurers as a considerable protection against fire losses. Automatic fire fighting with the use of sprinkler systems has been known since the middle of the 19-th century. Sprinklers certainly guarantee that the thermodynamic potential of the extinguishing water is utilized to a high degree and their selective operation reduces the damage to materials by water. Sprinklers both give warning and fight the fire. Heat- or smoke-sensitive detection and alarm systems are also available; these give warning but do not fight the fire. The fire prevention engineer should take positive steps to ensure that fires are not caused and to promote the proper protection.

Exercise 1. Translate the following words paying attention to the suffixes:

1. to protect, protection, protective, protector;
2. to prevent, prevention, preventive;
3. manufacture, manufacturer, manufacturing;
4. to ignite, ignition, igniting;
5. to provide, provision, providing, provided;
6. to differ, different, to differentiate, difference;
7. attributable, capable, suitable, considerable, durable;
8. hardness, compactness, thickness.

Exercise 2. Find the English equivalents to the following word-combinations in the text:

Глобальные потери от крупных пожаров, взрывоопасная атмосфера, воспламеняющиеся жидкости, безопасные зоны, взрывозащищенная конструкция, панель аварийного вызова, поджог, угроза преступного нападения, мероприятия по борьбе с пожаром, должен иметь в виду, система спринклерного орошения; вода, используемая для тушения; предупреждают; система оповещения; пожары, вызванные...

Exercise 3. Find and translate the sentences with the -ing forms in the text. Define the -ing forms (Participle I or the Gerund).

Example:

1. Speaking about industry, the study of large fires reveals that premises engaged in engineering and electrical goods manufacture are responsible for nearly 15 percent of the total losses from large fires. (Participle I)
2. People began studying higher mathematics in the 17-th century. (Gerund)
3. When translating this article the chemist found the description of a new element. (Participle I)

4. Measuring the temperature of the body was necessary. (Gerund)

Exercise 4. Scan through the text and write in the number of the paragraph that deals with the following topics:

1. The early days of fire fighting.
- The purpose of the remotely monitored systems.
- The reasons for arson.
- Safeguards to the industrial equipment.
- Residential fires.
- Automatic fire fighting.
- Sources of ignition in industry.
- Fire prevention at the design stage.
- Fire losses.
- The duties of the fire prevention engineer.

Exercise 5. Choose the key sentences of the paragraphs. Example:

1. Electrical equipment is a potential source of ignition of explosive atmospheres in areas where industrial operations involve flammable liquids and gases.

Exercise 6. Write down the key sentence from each paragraph

1. The efforts to protect property and prevent fires were made in Rome.
2. ...
3. ...

Exercise 7. Agree or disagree with the following opinion. Write an essay of 100-200 words to support your opinion. Use given expressions to help you (in my opinion, as far as I know, if I am not mistaken, as far as I remember)

Technological advances mean that protection against fire can be provided by various systems.

Exercise 8. Rearrange the sentences to make a short summary of the text.

1. Sprinklers both give warning and fight the fire.
2. But technological advances now mean that protection against the threat of fire can be provided by remotely monitored systems.
3. Electrical equipment is a potential source of ignition.
4. The catastrophic fires also can be residential.
5. The efforts to protect property and prevent fires were made long ago.
6. The electrical equipment should be located in non-hazardous areas.
7. Sprinkler systems are regarded as a considerable protection against fire losses.

Exercise 9. Using the given example and the following expressions, write your own variant of the summary of the text.

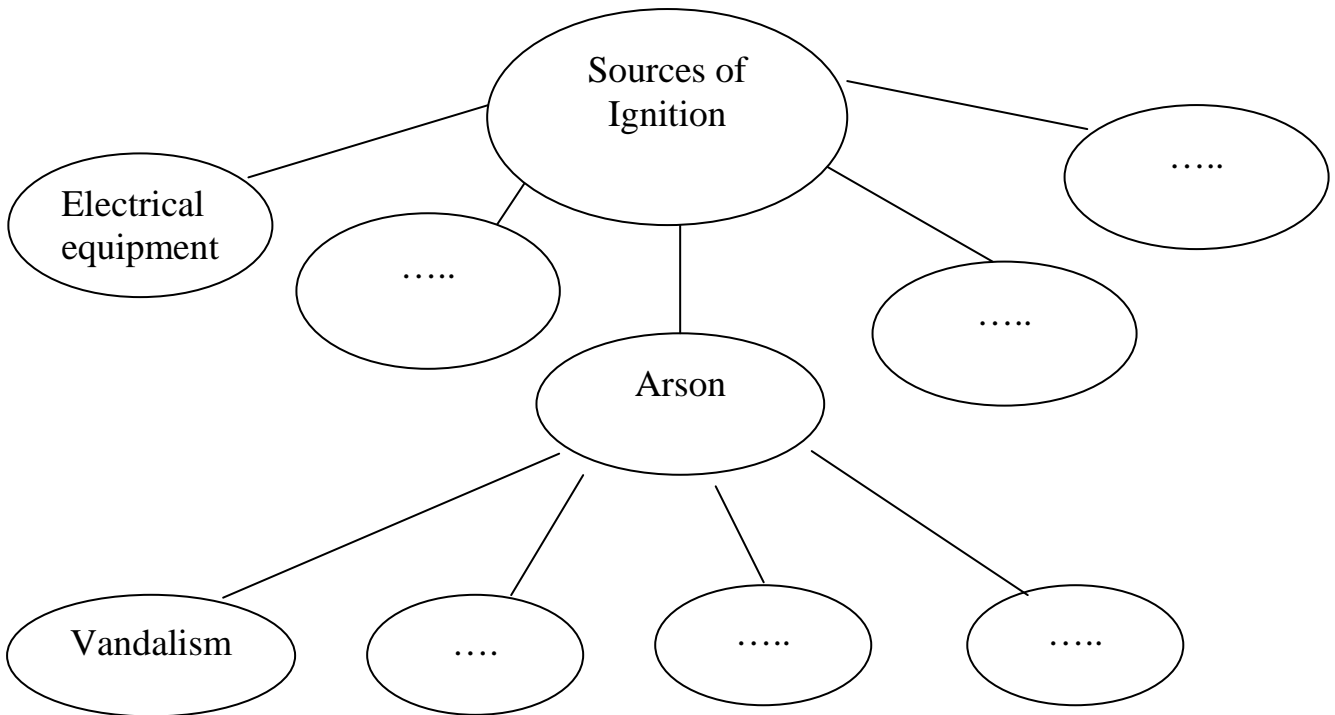
The text is devoted to the problem of fire threat and damage from it. The problem of conflagrations is the very old one.

The author underlines that the great deal of fires occurs in industry. And the electrical equipment is one of the main sources of ignition. **The author pays attention** to the location of the electrical equipment.

The word-combinations to be used:

1. the author touches upon the problem of; **2.** the text is devoted to; **3.** it deals with; **4.** the main idea of the article is; **5.** the author pays attention to; **6.** the article is about; **7.** in conclusion the author underlines.

Exercise 9. Build up:



Texts For Self-Study and Analysis

Fire Safety in Building

The history of fire prevention and protection abroad

We don't know for sure how the use of fire was discovered. We can only guess how it happened. Some think that lightning set fire to a dead tree and from that man learned about fire. Or probably he saw fire started by the rubbing together of two branches of a tree and then tried to imitate this process himself. Later man came to know the benefits of fire. Ever since man has known fire, he has feared it too.

Historians record that in Rome in about 300 BC a band of slaves was given the task of watching for fires from a top of a hill and of warning the citizens of fire. This type of captive fire watch was continued until the reign of Caesar Augustus. Under Caesar Augustus the first municipal-type fire department appeared. The command structure was almost identical to that is used by fire department today. There were 7 squads that contained from 100 to 1000 men per squad. Each man within each squad was given a particular task. For example, he could be a water carrier or perhaps a pump supervisor. Each squad had a supervising officer. When a fire occurred, Roman law demanded that the responsibility and the cause of the fire should be determined.

William I of England decreed one of the first recorded fire prevention regulations. The use of the open hearth for heating and cooking, within houses created a fire danger to such an extent that he ordered all fires be extinguished at night and hearth covered. This hearth cover consisted of a metal plate, called the curfew, and on the ringing of the evening bell all fires were to be extinguished and the curfew was to be put in place.

King Richard I decreed that walls 16 feet high and 3 feet thick should be built between the neighboring buildings to prevent fire spread. This requirement is similar to that of modern buildings standard which require fire and parapet walls to prevent fire spread from one building to another. However, the size and the thickness of the walls are now less than those of King Richards day.

After September, 2, 1666 further changes in fire prevention regulations took place. On that day the Great Fire of London began and burned for 5 days, leaving 373 acres of ashes. Following that fire the London City Council acted to prevent similar fires. Legislation was passed that required all homes were rebuilt to be of brick or stone, and dangerous home occupations were prohibited. Other great fires followed, but the first attempts at controlling fire through building and planning regulations had been made.

Almost before the settlement of America began, there were serious setbacks because of fire. The first permanent colony in Virginia was destroyed by fire and then in 1623 the colony in Plymouth suffered by destructive fire. Several reasons explain why

fire was such a hazard in the early American colonies: building their homes the English settlers used traditional building methods and materials of rural England. Total loss of all the buildings was almost assured if a fire started, and conflagrations were common.

Benjamin Franklin in 1736 recommended the formation of a volunteer fire company and served as the first fire chief in America. Later other famous men were involved in volunteer fire protection.

On October, 9, 1871 a sweeping fire destroyed most of the city of Chicago. The anniversary of this fire is commemorated by Fire Prevention Day, established in 1922.

The power of fire is a never-ending story: but the fight against fire is also a story worth telling.

Automatic fire protection installations

From the 19-th century onwards, the constant expansion of production facilities resulted in major fire catastrophes on a scale with which the fire brigades could hardly cope.

There were no automatic fire protection installations. In order to protect the environment, fire protection specialists have long since set themselves the task of preventing or restricting the incidence of contaminated extinguishing water. Development engineers in industrial fire protection laboratories have consequently been searching for procedures which will achieve a further increase in the degree to which the extinguishing potential of water is utilized.

The MicroDrop extinguishing process from German Company TOTAL WALTHER is a major step towards the optimum use of water as an extinguishing agent. The breakthrough was achieved by transforming the extinguishing water into a fog-like cloud of droplets distributed in space. The MicroDrop nozzles required to do this have been developed in TOTAL WALTHER Extinguishing Test Centre and have been tested in extensive series of trials.

Sprinkler systems are effective in overcoming fires at their early stages. The statistically proven success of sprinkler systems also allows to deviate from passive fire protection design rules in buildings, provided that sprinkler protection is installed.

The environment benefits from sprinkler protection are obvious: fire is checked in its early stages, and toxic gases are bound with the extinguishing water, harmful emissions can be largely prevented. This also allows a major reduction in the quantity of contaminated extinguishing water that must be retained.

TOTAL WALTHER Sprinkler Systems have been protecting people, property and the environment against the dangers of fire since the end of the 19-th century. The effectiveness of sprinkler systems is due to a number of factors: materials which have not yet been affected by the fire are moistened, which inhibits their combustion; the finely dispersed water which emerges from the sprinklers absorbs heat from the hot gases and rapidly cools the air. These effects help sprinklers to control fires within their initial boundaries;

the finely dispersed water binds and precipitates toxic smoke and fire gases which pollute the environment.

Sprinklers are spray nozzles which react automatically to the heat from a fire. They are held shut by a glass bulb which bursts when the actuating temperature is reached, releasing the seal. The release temperature should be 30 degrees C above the maximum expected operating temperature.

Striking architectural designs would be impossible without sprinkler protection.

Extinguishing agents

Water is the most effective agent for the extinction of fires of ordinary combustible materials. It is predominant because it is cheap and plentiful.

Although water is suitable for fires of ordinary combustible materials, it is sometimes dangerous or ineffective. Water is a good conductor of electricity and it should not be used on live electrical apparatus or wiring and on materials which react chemically with it. Some substances may ignite on contact with water, give off inflammable gas acetylene, aggravate the fire and may give rise to an explosion. Unlike water, the vaporizing liquid extinguishing agents have little cooling power. Their effect is in excluding oxygen from a fire.

The liquids are ineffective on powdered aluminium and not as efficient as water in extinguishing fires of wood, textiles, paper, rubbish, etc. They are suitable for application to small quantities of burning liquids, paints, greases and similar materials on which a blanketing effect is required, especially indoors. For large fires of liquids in the open air, foam is more suitable.

Foam is the most effective extinguishing agent for fires of liquids which are not mixed with water, e.g. petrol, paraffin, spirit, paints, oils and many others. The properties of the foam are following: a) flows freely over a surface of the liquid to form a blanket; b) resists heat, flame and wind; c) retains its water content for a long period.

Means of escape

When fire fighters enter a burning building to perform rescue work, they must first consider their own protection. In order to protect the burning surface from heat and flame he should wear proper clothing and have self-contained protective breathing equipment. Rope guide lines tied to rescuer's body are helpful when a rescue needs to be performed in the dark or under extremely hazardous situations.

Portable radios are valuable in rescue job. Fire streams are often used to protect fire fighters and victims. Victims may be trapped in a burning building and their normal means of exit may be cut off by fire. In order to reach such victims fire department ladders are needed. Fire service ladders are essential in the performance of both major functions: in saving lives and extinguishing fires.

There are ladders of various types: extension ladders - these are ladders with two or more sections, aerial ladders consist of a power operated, metal ladder mounted on a specially built chassis, hook ladders are used to climb a building to perform an entry on any floor for the purpose of rescue or for searching the building. They are supplied with a special hooks made of steel.

Personal protection for fire fighters during a rescue operation is absolutely necessary. A fire fighter needs protection against the weather, excessive heat and fire gases and should not take unnecessary chances during rescue operations.

A number of different types of ladders carried and extended by hand have been developed for Fire Service work. The most widely used are:

- a. First-floor ladders (non-extending type)
- b. Extension type
- c. Hook ladders
- d. Scaling ladders

Ladders may be carried on appliance in various combinations according to local needs. The ladder, generally of timber, is approximately 15 ft. 6 in. long and weighs about 45 lb.

Extension ladders are used at fires in circumstances where a wheeled escape is not necessary or cannot be employed owing to restriction of space, such as in narrow passages and in gardens. They are also frequently used as internal or external means of access where a stairway has been damaged by fire. Two ladders may be used together to form a step ladder.

Extension ladders may be of trussed or plain construction. The standard ladder is 35 ft. Ladders and what is termed a short extension ladder are also in use.

The hook ladders in general use in the Fire Service are made either of wood or aluminium alloy. Formerly all hooks were made of steel, but in recent years aluminium alloy hooks have come into increasing use.

Fire research work and training of fire safety engineers

The first fire testing station was built in 1935 at Boreham Wood to test elements of structure. This has grown into the present Fire Research Station as the result of cooperation between the government and the insurance industry. Now the Station is one of the largest and best equipped in the world.

Aim of the Station is to improve methods of preventing and fighting fire. Work is divided into five sections. In the operational research and intelligence section, details of fires are coded and analyzed. The ignition and growth of fire section studies the physical aspects of ignition, combustion and heat transfer.

Another section studies building materials under fire conditions to obtain basic data for the design and protection of buildings. Tests are carried out on structural elements. Results are used in advice given to architects, builders, structural engineers and local authorities on appropriate types of structure and materials. Two more sections deal with industrial fires and explosions involving gases, vapors, dusts and unstable materials not classified as explosives and the properties and methods of application of extinguishing

agents – water, foam and dry powder. Tests are also conducted equipment such as automatic sprinkler systems, fire extinguishers and automatic fire alarms.

In our country we can say we have the oldest Higher Educational centre in the world training safety engineers.

The Institute has accumulated a great deal of experience in training specialists for fire protection at different levels. It possesses constantly perfected education, the foundation for effective training and research work has been created in it.

There are the following faculties at the institute:

1. the faculty of fire safety engineers on the base of the general secondary education with five years period of training;
2. the faculty of fire safety engineers on the base of the secondary specialized education with three years period of education;
3. the faculty of training of leading staff officers with year and a half period of training;
4. a refresher course for fire safety engineers with one month period of education;
5. a post graduate and doctorate courses.

About 130 professors and teachers well-known in Russia and in other countries have been working at the institute.

Annually about 550 specialists in Fire Protection of the highest qualification graduate from the institute, the total number of such specialists is more than 18000.

About 2000 fire safety engineers and researches for five service of Bulgaria, Hungary, Viet-Nam, Germany, Guinea, Cuba, Moldavia, Poland, Czechia, Slovakia and other countries used to study at the institute.

The Moscow Institute of Fire Safety keeps in touch with many Fire Safety Educational Establishments.

There is a computer centre, a good library, a gymnasium, comfortable lecture rooms in our institute.

A lot of research work in many perspective directions of fire safety engineering has been carried out in the institute, there are scientific and technical sections there.

The research work tends to work out the scientific foundations and new information and communication technologies in the systems of fire safety so as to integrate them into the process of education and in the fire service practice, to increase the level of the fire protection for national economic objects.

The group of scientist is developing new means and methods of inflammable liquids and oil products extinction.

The scientists and teachers of the institute are also working out fire safety regulations and requirements. The research of fire-explosive qualities of substances and materials is being carried out as well as the development of the fire protection means for technological installations and equipment.

The results of the research work are actively introduced in the process of education in the following directions: working out automation systems, teaching programmes, normative documents bases.

In 1997 the Moscow Institute of Fire Safety jointly with the main State Fire Service Department of the Ministry of Internal Affairs of Russia created the National Fire Safety Academy which combined the efforts of the leading scientists of Russia for solving the most urgent fire safety problems.

Smoke control systems

Heat – or smoke – sensitive detection and alarm systems give warning but do not fight the fire. It is desirable to have such warning systems connected directly to the local or works fire brigade.

Smoke control and smoke managements systems greatly contribute to the safety of life and property in the early stages of a fire. Properly selected smoke dampers are an integral part of a smoke management or smoke control system. Smoke dampers assist in containing and exhausting smoke and pressurizing exit, access, and refuge areas with smoke-free outside air.

It was generally agreed that a smoke damper must have the following capabilities:

- Perform a job of shutting off a duct and preventing the passage of air or smoke.
- Resist elevated temperatures.
- Be a reliable device.
- Contribute to the versatility of the smoke management or smoke control system.

Smoke dampers and operators are to be qualified for smoke management and smoke control systems to pass reliability tests. The testing sequence is:

1) Cycling test - Dampers and operators must mechanically cycle for 5000 full stroke operations.

2) Temperature resistance – Temperature resistance testing is used to classify dampers and operators at elevated temperature. After 30 min of exposure to the elevated temperature the operator must successfully open and close the damper three times.

3) Leakage resistance – Leakage resistance testing is performed after elevated temperature exposure. To ensure this it requires testing of three damper size extremes:

- Minimum width by maximum height to maximize leakage.
- Maximum width by minimum height to maximize leakage.
- Maximum width by maximum height to maximize leakage.

Proper selection of smoke dampers plays an integral role in smoke control systems.

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Unit X

Economics Today

Speciality: **Economics Today**

Grammar: **Stress, Passive Voice, Possessive Case
Numbers. Prepositions, Word Order.**

Money plays an important role in everyone's life. However, each country has its own attitudes and feelings about money. This unit looks at money at home and at work.

American Money

After Mary Reed and Edith Osswald

Five little cents
Shiny and bright
Will buy as much
As one nickel might.
Ten little cents
You'll spend at one time,
And buy as much
As with one little dime.

One quarter will buy
As much at the store
As five nickels,
But no more.
Two quarters cost
One half a dollar.
Four quarters equal
One paper dollar

How can we define economics?
What do economists do?

What Do Economists Do?

Economics deals with the problems of scarcity and choice that have faced societies and nations throughout history, but the development of modern economics began in the 17th century. Since that time economists have developed methods for studying and explaining how individuals, businesses and nations use their available economic resources. Large corporations use economists to study the ways they do business and to suggest methods for making more efficient use of their employees, equipment, factories, and other resources.

Text A. The Basic Economic Problems.

‘There is always plenty of business, if you are smart enough to
get it.’

E.W. Hove (1853-1937)
American writer

Vocabulary

- | | | |
|--------------------------------------|-------------------------------|--------------------------------------|
| 1. to allocate ['xɪləkeɪt] | the factors of production | - размещать факторы производства |
| 2. scarcity ['skeɪsɪti] | n. - | экономия |
| 3. goods ['gudz] | n. - | товары; |
| 4. consume [kən'sʃʊm] | v. - | потреблять |
| 5. overall output ['aʊtpʊt] | - | общий объём производства |
| 6. income ['ɪnkʌm] | n. - | доход; |
| 7. cause-and-effect relationships | - | причинно-следственные связи |
| 8. production and consumption | - | производство и потребление |
| 9. natural resources [ˈnætʃrəl 'sɪz] | - | природные ресурсы |
| 10. human resources | - | человеческие ресурсы |
| 11. capital and entrepreneurship | ['kæpɪtəl ˌɒntrəprəʒ 'nɜːʃɪp] | - капитал и предпринима-
тельство |
| 12. return or reward | [rɪ'wɜːld] | - доход или вознаграждение |
| 13. opportunity costs | [ɒpə'tjʊnɪti] | - альтернативные издержки |

Task I. Read text A “The Basic Economic Problems”.

The central problem of economics is to determine the most efficient ways to allocate the factors of production and solve the problem of scarcity created by society's unlimited wants and limited resources. The only way it will be able to increase the production of one thing will be by reducing the production of something else.

To summarize: human wants are unlimited, but the resources necessary to satisfy those wants are limited. Thus, every society is faced with the identical problem, the problem of scarcity.

Economists have two ways of looking at economics and the economy. One is the macro approach, and the other is the micro. Macroeconomics is the study of the economy as a whole; microeconomics is the study of individual consumers and the business firm.

Macroeconomics examines questions such as how fast the economy is running; how much overall output is being generated; how much is total income. It also seeks solutions to macro-economic problems such as how employment can be increased, and what can be done to increase the output of goods and services. Microeconomics examines cause-and-effect relationships that influence choices of individuals, business firms and society.

It is concerned with things such as scarcity, choice and opportunity costs, and with production and consumption. Principal emphasis is given by microeconomists to study of prices and their relationship to units in the economy.

The resources that go into the creation of goods and services are called the factors of production. The factors of production include natural resources, human resources, capital and entrepreneurship. Each factor of production has a place in economic system, and each has a particular function. People who own or use a factor of production are expecting a «return or reward». This generates income which, as it is spent, becomes a kind of fuel that drives the economy.

Exercise 1. Underline the syllable, which has the main stress:

production	advertise
produce	advertising
product	advertisement
consume	purchase
consumption	purchasing

Task II. Read the definitions of following words and memorize them:

Income (доход) - денежные средства, получаемые частным лицом или компанией за какую-либо деятельность, включая заработную плату, доходы от торговли, проценты от инвестиций;

Goods (товар) - продукт труда, предназначенный для продажи;

Price (цена) - денежная сумма, взимаемая за конкретный товар или услугу;

Capital (капитал) - стоимость, приносящая прибавочную стоимость или прибыль;

Economics (экономическая наука) - наука о производстве, сбыте и потреблении товаров; народное хозяйство;

Employment - занятость рабочей силы;

Macroeconomics - наука об экономике в целом;

Microeconomics - наука об экономике компании или потребителя;

Output - выпуск продукции; объём производства;

Product (товар) - всё, что может удовлетворить потребность или нужду, и предлагается рынку с условием привлечения внимания, приобретения или потребления.

Exercise 2. Fill in the gaps using the terms: *macroeconomics, microeconomics, economics, employment, product*.

1. We can define ... as the social science that analyzes how society chooses scarce resources to satisfy its wants.
2. ... analyzes activities of families and large firms.
3. ... deals with global questions.
4. Demand is ability to buy a...or service at a particular time and place.
5. The level of ... is the number of people with a job.

Exercise 3. Match the words from two columns.

- | | |
|------------------------------|--|
| 1. society's unlimited wants | a. сталкивается |
| 2. reducing the production | b. отдельные потребители |
| 3. is faced | c. неограниченные потребности общества |
| 4. as a whole | d. общий доход |
| 5. individual consumers | e. основное внимание |
| 6. total income | f. в целом |
| 7. principal emphasis | g. сокращение производства |

Task III. Study useful phrases with word “*business*”:

- *do business* means “to work”
- *go into business* means “set up a company and start work”
- *go out of business* means “stop working as a company”
- *on business* means “for business purposes”
- *run a business* means “be in charge of and control a business”

Exercise 4. Put the proper words in the following sentences.

1. Are you going to London__ or for the fun of it?
2. After college, he__ with his father.
3. The company lost a lot of money and finally__.
4. Big oil companies__ with foreign governments.

5. My grandfather is the president of the company, but my parents really__.

Task IV: Learn the information about the Passive Voice.

We make passive verb forms with the verb *to be* + *past participle*. We use a passive structure when it is not necessary to know who performs an action.

Kiwifruit are grown in New Zealand.

The missing file has been found..

Exercise 5. Fill in the gaps. Make Passive sentences.

Active

Passive

They often do it. →	→	→	→	→	It is often done.
They are doing it now. →	→	→	→	→	It is being done now.
They did it yesterday. →	→	→	→	→	It ... yesterday.
They were doing it last week.	→	→	→	→	It ... last week.
They have already done it.	→	→	→	→	It.....
They will do it next week.	→	→	→	→	It ... next week.
They will have done it by Sunday. →	→	→	→	→	It ... by Sunday.
They had done it earlier.	→	→	→	→	It ... earlier.
They had to do it at once.	→	→	→	→	It ... at once.
They may not have done it yet.	→	→	→	→	It ... yet.

Exercise 6. Open the brackets using the Passive Voice.

1. The laws of demand and supply (to work out) by Lardner, An Irish Professor of Philosophy of the University of London.
2. Economic power in the USA (to distribute) unevenly.
3. The good (to deliver) to the buyer last week.
4. The production of the company (to exhibit) till the end of the month.
5. This computer (not/ to use) for a long time.
6. We (to inform) that the payee has not received the funds yet.
7. The first computer (to invent) by Alan Turing.

Task V: Learn the information about the Possessive Case.

We use 's to express a relationship between a person or organization and another person or thing.

Mr Blake's secretary.

BA's employees.

Volvo's reputation.

Exercise 7. Replace the of-phrase by the Possessive Case:

the assistant of the chief executive; the duties of a manager; the economy of Britain;
for the sake of economy; the works of Adam Smith; the newspaper of today.

Exercise 8. Translate into English.

1. Экономика - это наука о том, как люди, имея ограниченные ресурсы, делают выбор для производства различных товаров и услуг с целью удовлетворения своих потребностей.
2. Макроэкономика изучает хозяйство в целом.
3. Микроэкономика - это наука о потребителях и фирмах.
4. Экономика исследует проблемы занятости.
5. Человеческие потребности безграничны, а ресурсы, необходимые для того, чтобы удовлетворить эти потребности - ограничены.

Exercise 9. Answer the following questions:

1. What's the difference between macroeconomics and microeconomics?
2. What questions does macroeconomics examine?
3. What problems does microeconomics deal with?
4. What are the factors of production?
5. What is the central problem of economics?
6. What questions must every society answer?
7. What is the fuel that drives the economy?

Exercise 10. Speak about the Basic Economic Problems using expressions:

I'm going to speak about...

The text is about...

I'll start by saying that...

Now just a few words about...

One of the main problem is...

We shouldn't forget that...

In conclusion I'd like to say that...

The problem of the text is of the great importance...

To sum it up...

I'm going to speak about the basic economic problems. ***I'll start by saying*** that the central problems of economics are the factors of production and the problem of scarcity. ***We shouldn't forget that*** every society is faced with the problem of scarcity. ***Now just a few words*** about two ways of looking at the economy.

Text B. Money and Its Functions.

'Money talks they say. All it ever said to me was "Goodbye".'

Cary Grant (1904-1986),
American film star

Vocabulary

- | | |
|--|--|
| 1. the means of payment ['peImənt] - | средство платежа |
| 2. medium of exchange [Iks'tseɪnɪŋ] - | средство обращения |
| 3. a standard of value ['vxlju:] - | мера стоимости |
| 4. a unit of account [q'kaunt] - | единица учёта |
| 5. a store of value - | средство сбережения (сохранение стоимости) |
| 6. a standard of deferred payment - | средство погашения долга |
| 7. a monetary unit - | денежная единица |
| 8. to pay interest - | приносить процентный доход |
| 9. an interest-bearing bank account - | счёт в банке с выплатой процентов |
| 10. to erode [I'rəʊd] - | зд. фактически уменьшаться |
| 11. commodity money - | деньги-товар |
| 12. a bank deposit [dɪ'pɒzɪt] - | вклад в банке |

Task I. Read text “Money and Its Functions”.

9.2 Text B “Money and Its Functions”

The main feature of money is its acceptance as the means of payment or medium of exchange. Nevertheless, money has other functions. It is a standard of value, a unit of account, a store of value and a standard of deferred payment.

Money, the medium of exchange, is used in one half of almost all exchange. Workers work for money. People buy and sell goods in exchange for money. We accept money not to consume it directly but because it can subsequently be used to buy things we wish to consume. Money is the medium through which people exchange goods and services.

Money is generally accepted in payment for goods, services, and debts and makes the trading process simpler and more efficient.

Money can also serve as a standard of value. Society considers it convenient to use a monetary unit to determine relative costs of different goods and services. In this function money appears as the unit of account, is the unit in which prices are quoted and accounts are kept.

To be accepted in exchange, money has to be a store of value. Money is a store of value because it can be used to make purchases in the future.

Houses, stamp collections, and interest-bearing bank accounts all serve as stores of value. Since money pays no interest and its real purchasing power is eroded by inflation, there are almost certainly better ways to store value.

Finally, money serves as a standard of deferred payment or a unit of account over time. When you borrow, the amount to be repaid next year is measured in money value.

Golden coins are the examples of commodity money, because their gold content is a commodity.

When you have a bank deposit the bank owes you money. You can write a cheque to yourself or a third party and the bank is obliged to pay whenever the cheque is presented. Bank deposits are a medium of exchange because they are generally accepted as payment.

Task II: Read the definitions of following words:

- economics* -science of the production, distribution and consumption of goods
- economy* -system of the use of resources
- economic* -connected with commerce
- economical*-careful in the spending of money, time and in the use of goods

Exercise 1. Choose the correct word from the two words given in brackets:

1. I have always been interested in (economics, economy).
2. In China (economic, economical) reforms began in 1979.
3. The Russian (economics, economy) is gradually becoming stronger.
4. She never wastes money, a very (economic, economical) woman.
5. The company's (economic, economical) strategy is well developed.
6. The UK is a mixed (economics, economy).

Exercise 2. Match the words and their definitions:

- | | |
|-------------------|--|
| 1. monetary unit | a. a means of payment(coins and bank notes given and accepted in buying and selling) |
| 2. commodity | b. the standard form of money in a country |
| 3. a bank deposit | c. a raw material or manufactured product made available for use or sale |
| 4. money | d. a sum of money paid into a bank or savings account |
| 5. currency | e. to give or receive goods, money in return for something of the same value |

1. Money doesn't always bring happiness.
2. He doesn't usually carry much money on him.
3. He lost all his money when his business company failed.
4. How much cash do you have?
5. You're paying in cash, aren't you?
6. The company produces a new commodity every year.
7. Foreign exchange markets are the markets where foreign currencies are traded.

1. The company produces a brand of coffee.
It..... a brand of coffee.
2. In particular, we produce high-quality coffee.
We..... in high-quality coffee.
3. Customers buy coffee in 400 stores.
The company..... coffee in 400 stores.
4. Our turnover for this year is \$285 million.
We have..... of \$285 million this year.
5. The head office of the company is in Seattle.
The company is..... in Seattle.
6. We have many stores on the West Coast.
Many of our stores are..... on the West Coast.
7. 6,000 people work for the company.
The company..... 6,000 people.

£ 3.15	Currencies
\$ 7.80	three pounds fifteen
	seven dollars eighty

€ 250 two hundred and fifty euros

Decimals

16,5	sixteen point five
17,38 %	seventeen point three eight percent
0,185	(nought/zero) point one eight five
2/3	two thirds

Exercise 5. Write the numbers using *figures*:

nineteen ninety-nine 1999

1. three point one million pounds...
2. twelve point four percent...
3. nineteen pounds sixty-five...
4. one thousand seven hundred (and) sixty-five...
5. three hundred (and) seventy eight dollars...
6. one third of the land area...

Task IV: Learn how the prepositions *for, at, in* are used.

for + name of company	I work for Sony.
for + name of person	I work for Mr. Jones.
for + job	I work for an accountant.
in/at + workplace	I work in a bank. I work at a factory.
in + department/section	I work in the sales department. He works in the accounting department.

Exercise 6. Put the prepositions *for, at, in* in the following sentences:

1. I work...Japan Air Lines.
2. He works...the Daily News.
3. She works... Italian restaurant.
4. They work...the front office.
6. We work...a TV station.
7. I work...travel company.
8. You work...the personnel department.
9. My friend works...a sales manager.

Exercise 7. True or false.

1. Money is a means of payment for goods and services.
2. People buy and sell goods in exchange for raw materials.
3. People work for money.
4. The main function of money is to sell goods.

5. Private production of money is against the law.
6. Every businessman hopes to achieve success.

Exercise 8. Using the information from the text, characterize:

- функции денег;
- различные виды денег;
- денежные накопления;
- вклад в банке.

Exercise 9. Put the missing words into the text:

1. Money is a medium of exchange in $\left\{ \begin{matrix} \text{economy} \\ \text{science} \\ \text{industry} \end{matrix} \right\}$. 2. It is a means of $\left\{ \begin{matrix} \text{exchange} \\ \text{payment} \\ \text{measurement} \end{matrix} \right\}$ for goods and services. 3. The $\left\{ \begin{matrix} \text{money} \\ \text{coins} \\ \text{price} \end{matrix} \right\}$ of the commodity is the number of units of money required to buy this commodity. 4. Without the use of money, trade would be reduced to $\left\{ \begin{matrix} \text{market} \\ \text{barter} \\ \text{economy} \end{matrix} \right\}$. 5. Workers work for $\left\{ \begin{matrix} \text{money} \\ \text{value} \\ \text{payment} \end{matrix} \right\}$. 6. People $\left\{ \begin{matrix} \text{cost} \\ \text{pay} \\ \text{buy} \end{matrix} \right\}$ goods in exchange for money. 7. Money can serve as a standard of $\left\{ \begin{matrix} \text{living} \\ \text{value} \\ \text{payment} \end{matrix} \right\}$.

Exercise 10. Speak about *money* and its functions using key words and word combinations:

1. A medium of exchange
2. A measure of value
3. A unit of account
4. A store of value
5. A means of making deferred payments
6. Commodity money
7. Interest-bearing bank accounts

Text C. Marketing

‘Communication is the most important form of marketing’

Akio Morita (1921-1999),
Japanese co-founder of Sony

VOCABULARY

1. customer needs -	нужды покупателя
2. profit n. -	прибыль
3. benefit n. -	преимущество
4. promotion n. -	содействие в продаже товара
5. advertising ['xɔvwtQIzɪn] -	реклама
6. packaging n. -	упаковка
7. market v. ['mRkɪt] -	продавать
8. outlet n. ['Qutlet] -	торговая точка

Task I. Read text “Marketing”.

1. Marketing is the process of planning, designing, pricing, promoting and distributing ideas, goods and services, in order to satisfy customer needs, so as to make a profit.

Companies point out how the special characteristics or features of their products and services possess particular benefits that satisfy the needs of people who buy them. Non-profit organizations have other, social goals, such as persuading people not to smoke, or to give money to people in poor countries, but these organizations also use the techniques of marketing. In some places, even organizations such as government departments are starting to talk about, or at least think about their activities in their terms of the marketing concept.

2. Marketing includes ‘four Ps’. ‘The four Ps’ form the basis of the marketing mix. If you want to market a product successfully, you need to get this mix right.

Product: deciding what to sell;

Price: deciding what prices to charge;

Place: deciding how the product will be distributed and where people will buy it;

Promotion: deciding how the product will be supported with advertising, special activities, etc.

A fifth P which is sometimes added is packaging: all the materials are used to protect and present a product before it is sold. The four Ps are useful summary of the marketing mix, the activities that you have to combine successfully in order to sell.

3. To market a product is to make a plan based on this combination and put it into action. A marketer or marketeer is someone who works in this area.

Marketers often talk about market orientation: the fact that everything they do is designed to meet the needs of the market. They may describe themselves as market – driven, market-led or market-oriented.

4. Most people and many managers do not understand the role of marketing in modern business. Marketing is two things. First, it is a strategy and set of techniques to sell an organization's products or services. This involves choosing target customers and designing a persuasive marketing mix to get them to buy. The mix may include a range of brands, tempting prices, convenient sales outlets and a battery of advertising and promotions. This concept of marketing as selling and persuasion is by far the most popular idea among both managers and the public.

5. The second, and by far more important concept of marketing, focuses on improving the reality of what is on offer. It is based on understanding customers' needs and developing new solutions which are better than those currently available. Doing this is not a marketing department problem, but one which involves the whole organization.

Task II: Read the definitions of the following words and memorize them:

1. **Marketing (маркетинг)** - вид человеческой деятельности, направленный на удовлетворение нужд и потребностей путём обмена.
2. **Advertising (реклама)** – любая платная форма представления идей, товаров или услуг.
3. **Marketing management (управление маркетингом)**- анализ, планирование, проведение мероприятия в сфере обмена для достижения определённых целей.
4. **Marketing research system (система маркетинговых исследований)** – включает обзор рынка, исследование покупательских предпочтений, прогноз объёмов продаж, исследование эффективности рекламы

Exercise 1. Find in the text English equivalents for the following word combinations:

получать прибыль; удовлетворять нужды людей; неприбыльные организации; социальные задачи; по крайней мере; теория маркетинга; удовлетворять нужды рынка; набор приёмов; удобные торговые точки.

Exercise 2. Put the words in the correct order.

1. some money / I / from a friend of mine / borrowed.
2. the name / company / your / is / What / of?
3. sales / What / company's / the annual / are?
4. does / the company / many / How / employ / people?
5. in modern business / most people / the role of marketing / and many managers / do not understand.

Task III: *Skimming* means reading quickly, without reading every word, in order to get the main idea.

Exercise 3. Skim through the text and write in the number of the paragraph that deals with each of the following topics:

- четыре составляющие маркетинга
- роль маркетинга
- стратегия маркетинга
- рыночная ориентация

Task IV: *Scanning* means looking over a reading for specific information.

Exercise 4. Scan the text to find the information on the following aspects:

- the role of marketing
- the concept of marketing
- marketing mix
- market orientation
- the four Ps

Exercise 5. Choose the topic sentence of each paragraph.

1. Marketing is the process to satisfy customer needs and to make a profit.
2. _____
3. _____
4. _____
5. _____

Exercise 6. Answer the following questions using expressions:

The text deals with (the problem of)...

It is clear from the text that...

It should be noted that...

To my mind...

According to the text...

On the whole...

1. Which of the four Ps is mentioned here?
2. Does the author think the four Ps are complete definitions of marketing?
3. Does the author think that marketing is only for marketers?
4. Can poor products be made successfully by clever marketing techniques?

Exercise 7. Match the sentence beginnings (1-5) with the correct endings(a-e).

- | | |
|---|--|
| 1. Farms are now more market-oriented... | a. such as Microsoft and Sony, are in several markets at once. |
| 2. Since the 1980s, Britain has had a much more market-led... | b. and the audience decides the direction it takes. |
| 3. Many market-led growth businesses,... | c. led to falling sales and profits. |
| 4. Lack of investment and market orientation... | d. and less dependent on government money. |
| 5. American TV is a market-driven industry,... | e. approach to economics. |

Task V: *Summarizing means taking only the most important ideas and information from reading and putting them in your own words.*

Task IV. Read the summary of Text C. Write your own variant and compare it with your summary of the text.

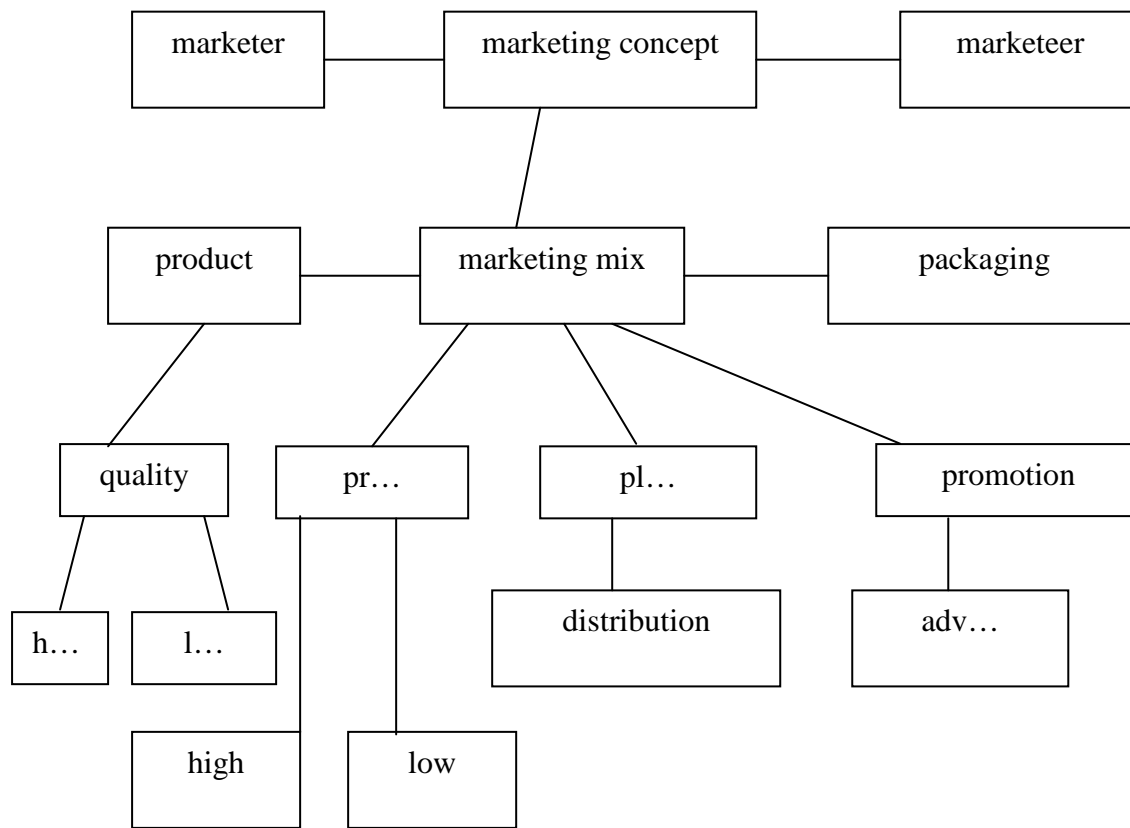
The text deals with the problem of marketing. The author considers that it is the process including planning, designing, pricing, promotion and distributing goods and services.

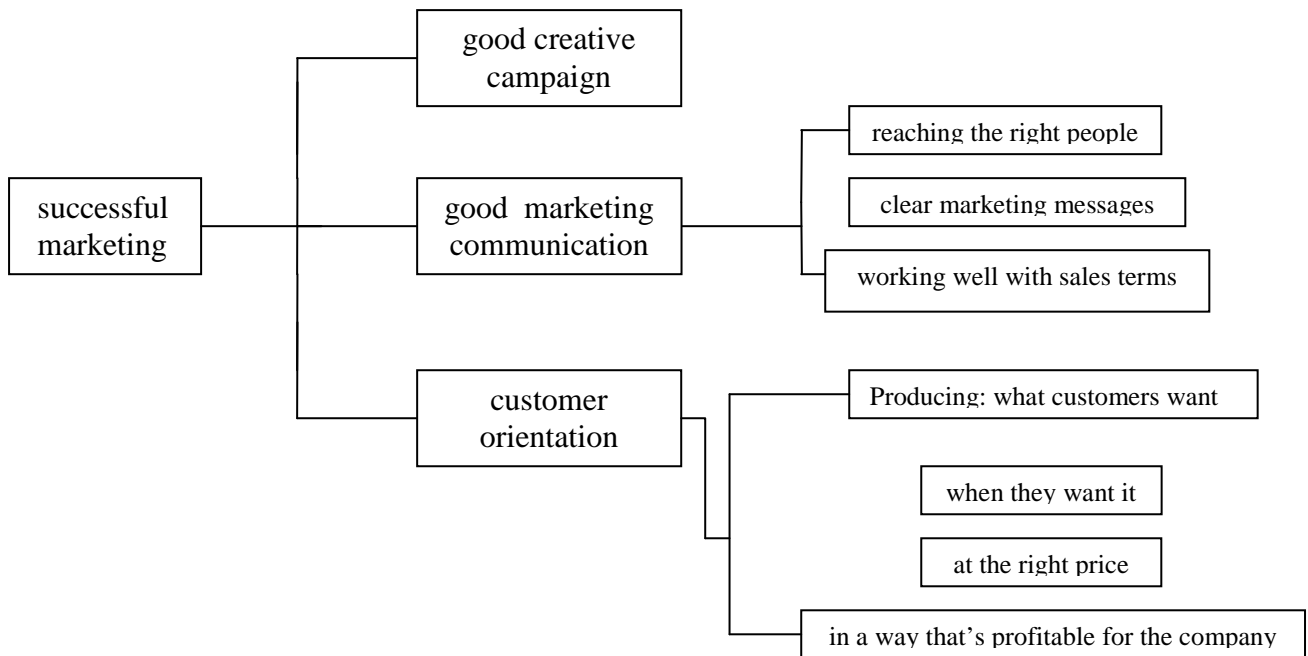
Great importance is attached to marketing mix. It consists of four main elements-product, price, place (or distribution) and promotion. In the text each element of the marketing mix is described. It is clear from the text that you have to combine the activities successfully in order to sell. In the text it is said that marketing is two things: a strategy and set of techniques and methods. According to the text, a very important part of the marketing is concept of marketing.

To sum it up, we can conclude that the four basic parts of marketing are problems of the whole organization.

Exercise 8. Do you agree or disagree with the following opinion? Write an essay of 150-200 words to support your opinion.

Most people and many managers do not understand the role of marketing in modern business. Many people do not understand the difference between selling and marketing.

Exercise 9. Built up the spider gram:

Task VII. Speak about successful marketing using the chart:

Texts for Self-Study and Analysis

Economics Today

Text 1

Your Dream House

In the United States, the largest purchase most people make is their home. The majority of American families own their own homes. These homes are symbols of independence and self-sufficiency.

A new generation is changing the plan for the great American dream home. Their ideas reflect today's values.

The big, open kitchen in the center of the house says: *We love our time with family*. The stress-free master bedroom¹ with a bathtub and private parlor says: *We still need time away to relax*. A high-tech home office states: *We keep one eye on work*. But a welcoming front porch² insists: *We want to feel connected, to be neighbors*.

Baby boomers (the 78 million Americans born) make the trends³ in home design. When baby boomers build their dream homes, they demand "much more than basic shelter", says designer Caroe Eichen. "We're no longer selling homes to people: we're selling lifestyles." Mark and Lorene Heinze are buying.

Their 2,300-square-foot new house near Detroit has the latest features: a big bathtub, extra storage, and high ceilings. "When I walk into my house," Lorene says, "I think, I just love it."

757,000 U.S. families bought new homes in 1996, the best year for sales of new homes since 1978. Buying dream home is a fantasy with a variable price tag. A house like the Heinzes' costs about \$250,000 in the Detroit area, \$120,000 in Houston, \$205,000 in Denver, \$323,000 in Boston and \$338,000 in northern California.

Baby-boomers may see their dream home differently from homebuyers born before or after them. However, some design features appeal to all generations. These new designs appear first in luxury houses in trend-setting California. Once they become popular, builders modify them for lower price ranges and copy them nationwide.

So Mark Heinze is working in his home near Detroit, making his unfinished basement into a playroom, a woodworking shop, and a home office. This house fulfills his dream: "I wanted to feel, when I came home from work, that I'm on vacation," he says. "this house is everything I wanted and more."

¹ master bedroom=the largest bedroom in the house, usually occupied by the parents in a family.

² porch=an open area in front of a house

³ trends=tendencies, directions, fashions

Text 2

What is Co-housing?

In many countries, it is not unusual for families of different backgrounds to live together in shared space. However, in the United States, this idea may still be considered odd.

But this type of housing, called co-housing, is gaining popularity in the United States, too. Co-housing **complexes**¹ are popping up in cities across the country. For many people, this way of life is a relief to the busy modern style. About 25 co-housing communities have been built in recent years, and 150 more are planned.

In co-housing complexes, everyone helps take care of children and elderly residents. It's also a place where residents shop, cook, and eat together. Residents of co-housing complexes like its sense of shared community.

Children have other kinds to play with, which many families like. Other residents like the feeling of living in a "village." Residents also say that they can live in co-housing for less money than they would pay for nearby apartments.

Some people may think that co-housing might be like a 1960s "**hippie**" **commune**². But after they learn about it, they change their minds. This is because privacy is still important to residents. They have individual houses, not one big house, as old-style communes did. Although they share the responsibilities of the community, each family still lives its own life.

Will this trend catch on? It probably will never become the most popular form of housing in the United States, but for many, it's the answer to many of the problems of a busy modern life.

Text 3

A Student Budget

College gives the people the chance to learn and make friendships that will last a lifetime. Many people in North America begin college at the age of eighteen. Many students go to school and work part-time to help pay for their education.

In the United States, the cost of a college education can be quite expensive. Undergraduate³ tuition⁴ at a public⁵ university can cost between \$2,000 and \$10,000 a year. That amount rises to between \$14,000 and \$24,000 a year at a private⁶ university. Students must also pay for textbooks and stationery⁷. These can cost \$500 to \$800 per

¹ complexes=groups

² commune=housing that is shared by more than one family. The work and childcare responsibilities are usually shared in a commune.

³ undergraduate=a student completing a bachelor's, or first degree

⁴ tuition=money used to pay for teaching

⁵ public=schools run by the state or government(in the UK, "public school" means private school; schools run by the government are called "state schools")

⁶ private=schools not run or owned by the state or government

⁷ stationery=writing materials and office supplies

year. Students who live in campus⁸ housing pay between \$3,500 and \$9,000 per year for room and board⁹. Add money for clothes, travel, and other personal expenses, and one year at a university can cost as much as \$35,000!

Students need to spend their money carefully. At Eastern Michigan University, advisors¹⁰ help students to plan and stick to a budget. They suggest this: At the start of school semester, write down your income, for example, money you will get from your family or a part-time job. Then, list all of your expenses. Put your expenses into two groups: those that change (food, phone, books, travel), and those that stay the same (tuition, room and board). Add together all of your expenses. Then, subtract¹¹ these from your income. Do you have enough money, or you need more?

Learning to stick to a budget is not always easy. But for many, it is easier than borrowing money from family or friends in the middle of a semester.

Text 4

Housing and Social Security

More than two British families in every five live in a home built since 1945. Over half of all dwellings are owned by their occupiers and nearly a third are rented from public housing authorities. Most of the rest are rented from private landlords, and a small number from non-profit-making housing associations. Houses are much more common than flats - the ratio is roughly four to one. The building of new houses is financed by both public and private sectors. Private building is almost entirely for sale to owner-occupiers, while public authorities, which have provided houses mainly for renting, are now encouraged to sell to tenants who want to buy. Loans for house purchase are available from various sources and tax concessions are granted to borrowers. There are also rent rebate schemes and a system of rent allowances to help poorer tenants.

Although problems remain, housing conditions have vastly improved in the past three decades. There are slightly more dwellings than households, although shortages remain in some areas and the houses are not always of the type in demand. An emphasis is placed on improving the older existing dwellings and their environment. Public grants are paid towards the cost of improving older homes.

The social security system is designed to secure a basic standard of living for people in financial need. It provides three kinds of help: benefits which are paid in return for contributions to the national insurance scheme; non-contributory benefits paid to certain groups of people regardless of income; and benefits (which are also non-contributory) designed to bring the incomes of people with limited means up to a guaranteed weekly level.

⁸ campus=area and buildings of a school, college, or university

⁹ room and board=cost of renting a room including payment for gas, electricity, and some meals

¹⁰ advisors=people who give help and advice to others

¹¹ subtract=minus, take away

Text 5**Who is Really Working in the U.S.A**

I was always thinking that I was tired because I need iron and vitamins. But now I found out the real reason: I'm tired because I'm overworked.

The population of the U.S.A. is 237 million. 104 million are too old to work. And this number is as big as the first. That leaves 133 million who can do the work.

There are 85 million who are being taught in the school, which leaves 48 million for the work.

Of this there are 29 million who are assisting the federal government. This leaves 19 million for the work.

Four million are serving in the Armed Forces, which leaves 15 million for the work.

Take from that the 14,800,000 people who are working for State and City government and that leaves 200,000 for the work.

There are 188,000 lying in the hospitals, so that leaves 12,000 for the work. And this number is not as big as the numbers, which were being discussed a minute ago.

Now, there are 11,998 criminals in the prisons. That leaves just two people for the work.

You and me.

And you sitting there reading this.

Paper Money

Paper money (or bank notes) was not always produced by central banks. Originally, non-metal money was started in China 1,200 years ago to solve the problem of coins. The coins were very heavy and inconvenient for business, and besides, Chinese rulers did not want to spend so much gold, silver and copper on money.

The oldest Chinese notes, which still survive, come from the Ming dynasty (1368-1644). They were made of trees, and some of them were very large: 22,8 cm x 33 cm. One such note was equal to 1,000 copper coins weighing over 3.5 kilos.

Paper money came later, and soon became popular in Europe, too. Europe's first official bank notes were made in Sweden in 1661. Thanks to the new paper money the economic history of our civilization was changed.

Carrying Cards

In Japan, there are strict rules for giving and taking business cards. Japanese people use both hands to give business cards to others.

Japanese people also use both hands to take business cards. In Japan, people look at business cards carefully. Then they put the business cards away. People never put

business cards in a back pocket. People never write on business cards. Mr. Wilson insulted Mr. Ito when he wrote on the business card.

Mr. Wilson did not mean to insult Mr. Ito. He spoke some Japanese, but he did not know Japanese customs about business cards. Americans do not have strict rules about business cards. Americans give or take business cards with either hand. Americans may write on business cards. They keep business cards anywhere that is convenient.

Culture Capsule

Americans have strict rules about time in business. It is important to be on time. A meeting that is scheduled for 10 a.m. really starts at 10 a.m. You should get to a meeting a few minutes early. If you cannot be at a meeting, you should call the other people and tell them. This shows respect for the other people at the meeting. You should also call if you will be late.

Most business offices are open Monday through Friday from 9 a.m. to 5 p.m. Every day, workers usually take one hour for lunch and two ten-minute breaks. Most workers get from five to fourteen paid holidays. Workers usually get two weeks of paid vacation each year.

Text 6

The European Common Market

Where does European wealth come from? Economists put forward an interesting hypothesis. According to this, the prototype of the European Common Market started in 1248, when two German cities - Hamburg and Lubeck - agreed to protect each other's ships and people. Scientists also say that their union grew, and by the year 1400 over 150 cities of Northern Europe were in it. Many books of that period mention the fact that the cities' wealth grew with the league.

Future forecasts about European Common Market are very optimistic: it will grow and develop.

Text 7

International Bank for Reconstruction and Development

The Aims of the Bank

The International Bank for Reconstruction and Development also known as the World Bank is a specialized United Nations agency established at the Bretton Woods Conference in 1944. A related institution, the International Monetary Fund (IMF), was

created at the same time. The chief objectives of the bank, as stated in the articles of agreement, are “to assist in the reconstruction and development of territories of members by facilitating the investment of capital for productive purposes [and] to promote private foreign investment by means of guarantees or participation in loans [and] to supplement private investment by providing, on suitable conditions, finance for productive purposes out of its own capital...”

Conditions of Loans

The bank grants loans only to member nations, for the purpose of financing specific projects. Before a nation can secure a loan, advisers and experts representing the bank must determine that the prospective borrower can meet conditions predetermined by the bank. Most of these conditions are intended to ensure that loans will be used productively and that they will be repaid. The bank requires that the borrower be unable to secure a loan for the particular project from any other source on technically feasible and economically sound. To ensure repayment, member governments must guarantee loans made to private concerns within their territories. After the loan has been made, the bank requires periodic reports both from its own observers on the use of the loan and on the progress of the project.

What Countries Can Obtain Loans?

In the early period of the World Bank’s existence, loans were granted chiefly to European countries and were used for the reconstruction of industries damaged or destroyed during World War II. Since the late 1960s, however, most loans have been granted to economically developing countries in Africa, Asia, and Latin America. The bank gave particular attention to project that could directly benefit the poorest people in developing nations by helping them to raise their productivity and to gain access to such necessities as safe water and waste-disposal facilities, health care, family-planning assistance, nutrition, education, and housing. Direct involvement of the poorest people in economic activity was being promoted by providing loans for agricultural and rural development, small-scale enterprises, and urban development. The bank also was expanding its assistance to energy development and ecological concerns.

Sources of Funds

World Bank funds are provided primarily by subscriptions to, or purchase of, capital shares. The minimum number of shares that a member nation must purchase varies according to the relative strength of its national economy. Not all the funds subscribed are immediately available to the bank; only about 8.5 per cent of the capital subscription of each member nation actually is paid into the bank. The remainder is to be deposited only if, and to the extent that, the bank calls for the money in order to pay its own obligations to creditors. There has never been a need to call in capital. The bank's working funds are derived from sales of its interest-bearing bonds and notes in

capital markets of the world, from repayment of earlier loans, and from profits on its own operations. It has earned profits every year since 1947.

All powers of the bank are given to the board of governors, comprising one governor appointed by each member nation. The board meets at least once annually. The governors delegate most of their powers to 21 executive directors, who meet regularly at the central headquarters of the bank in Washington, B.C. Five of the executive directors are appointed by the five member states that hold the largest number of capital shares in the bank. The remaining 16 directors are elected by the governors from the other member nations and serve 2-year terms. The executive directors are headed by the president of the World Bank, whom they elect for a 5-year term, and who must be neither a governor nor a director.

Affiliates of the Bank

The bank has two affiliates: the International Finance Corporation (IFC), established in 1956; and the International Development Association (IDA), established in 1960. Membership in the bank is a prerequisite for membership in either the IFC or the IDA. All three institutions share the same president and boards of governors and executive directors.

IDA is the bank's concessionary lending affiliate, designed to provide development finance for those countries that do not qualify for loans at market-based interest rates. IDA soft loans, or «credits», are longer term than those of the bank and bear no interest; only an annual service charge of 0.75 per cent is made. The IDA depends for its funds on subscriptions from its most prosperous members and on transfers of income from the bank.

All three institutions are legally and financially separate, but the bank and IDA share the same staff; IFC has its own operating and legal staff, but uses administrative and other services of the bank. Membership in the International Monetary Fund is a prerequisite for membership in the World Bank and its affiliates.

Role of the Bank

The World Bank has been heavily criticized in recent years for its poor performance in development economics, especially with regard to the social and environmental consequences of the projects it supported in Third World countries. The bank itself has admitted considerable wrongdoing. However, it is arguable that it is less at fault than many of the corrupt or incompetent regimes whose schemes it is called on to fund. The bank's role in development has in any case diminished with the vast influx of private capital into profitable projects in developing countries. Health, education, and other fields unlikely to yield profits remain in need of an institution such as the World Bank.

Text 8**International Monetary Fund**

International Monetary Fund (IMF) is a specialized agency of the United Nations, established, along with the International Bank for Reconstruction and Development (the World Bank), at the UN Monetary and Financial Conference held in 1944 at Bretton Woods, New Hampshire. The IMF began operations in 1947. Its purpose is to promote international monetary cooperation and to facilitate the expansion and balanced growth of international trade through the establishment of a multilateral system of payments for current transactions and the elimination of foreign trade restrictions. The IMF is a permanent forum for consideration of issues of international payments, in which member nations are encouraged to maintain an orderly pattern of exchange rates and to avoid restrictive exchange practices. It also provides advice on economic policy and fiscal policy, promotes world policy coordination, and gives technical assistance for central banks, accounting, taxation, and other financial matters. Membership, currently comprising 179 countries, is open to all sovereign nations.

Activities

Members undertake to keep the IMF informed about economic and financial policies that impinge on the exchange value of their national currencies so that other members can make appropriate policy decisions. On joining the fund, each member is assigned a quota in special drawing rights (SDRs), the fund's unit of account since its establishment in 1969, whose value is based on the weighted average value of five major currencies. (In March 1994 the SDR was worth US\$1.41.) This replaced the old system whereby subscription of members was to be 75 per cent currency and 25 per cent gold. The total quotas at the end of 1994 were SDR 144.8 billion. Each member's quota is an amount corresponding to its relative position in the world economy. As the world's leading economy, the United States has the largest quota, some SDR 19 billion; the smallest quota is about SDR 2 million. The amount of the quota subscription determines how large a vote a member will have in IMF deliberations, how much foreign exchange it may withdraw from the fund, and how many SDRs it will receive in periodic allocations. Thus, the European Union has about 25 per cent of the voting strength, while the United States has about 20 per cent.

Members who have temporary balance of payments difficulties may apply to the fund for needed foreign currency from its pool of resources, to which all members have contributed through payment of their quota subscriptions. The IMF may also borrow from official institutions, and the General Agreement to Borrow of 1962 gave it the right to borrow from the so-called «Paris Club» of industrialized countries, which have undertaken to make up to US\$6.5 billion available if needed (this sum was raised to US\$17 billion). The member may use this foreign exchange for a certain time (up to about five years) to extricate itself from its balance of payments problem, after which the currency is to be returned to the IMF's pool of resources. The borrower pays a below-market rate of interest for the IMF resources it uses; the member whose currency

is used receives almost all of these interest payments; the remainder goes to the fund for operating expenses. The IMF is thus not a bank, but sells countries SDRs in exchange for their own currency.

The IMF also supports economic development, such as the establishment of functioning free market economies in the former Warsaw Pact countries. This includes a special temporary fund, established in 1993, to offset trade and balance of payments difficulties experienced by any member country abandoning artificial price control policies. Its structural adjustment facilities assist developing countries with economic reform: by the end of March 1994, these had provided SDR 4.3 billion to 44 countries. Loans under IMF terms frequently have stiff clauses attached regarding domestic economic policy: these have been the cause of some friction between the IMF and its debtors in the past.

History

Commencing operations in 1946, the IMF made its first major policy reform in 1962, with the establishment of the General Agreement to Borrow. It initially aimed to confine exchange rate fluctuations between member currencies to within 1 per cent of a par value quoted in terms of the US dollar and hence linked to gold; 25 per cent of members' subscriptions were to be in gold. The first major change in policy was the General Agreement to Borrow, concluded in 1962 when it became clear that the fund needed increasing. The 1967 IMF meeting in Rio de Janeiro led to the creating of the Special Drawing Right as a standard international unit of account.

In 1971 the IMF's par value system was renegotiated to allow a 10 per cent devaluation of the dollar and a broadening of fluctuation ranges to 2.25 per cent. The sharp oil price rises after 1973 severely affected member countries' balances of payments, and led effectively to the end of the Bretton Woods agreement to restrict exchange rate fluctuations. Revision of the fund's articles in 1976 ended gold's role as a basis for the IMF and hastening the demise of the gold standard, which the dollar left in 1978.

From 1982 the IMF devoted much of its resources to the resolution of the worldwide debt crisis, caused by excessive lending to developing countries. It assisted indebted members to devise programmes of economic adjustment and has backed this assistance with massive lending. In conjunction with its own loans, it encouraged additional lending from commercial banks. As the realization grew that the problems of its members involved long-term structural inadequacies, the IMF established new facilities, using funds borrowed from better-off members, to provide money in larger amounts and for longer periods to members that seek to reorganize their economies.

The IMF acquired an important new remit at the end of the 1980s with the implosion of European Communism and the appearance of a host of European states determined to join the global capitalist system. This role was initially met through a series of new funds for overhauling the former command economies of Central and Eastern Europe. The debt crisis by this time had largely abated.

The IMF has to some extent lost its original form and purpose, since exchange rates are now largely left to the currency markets to determine. Modern regimes that

control exchange rates, such as the European Exchange Rate Mechanism, are usually tied to convergence programmes design to produce international currencies, and the ERM's breakdown in 1992 demonstrated the IMF's relative impotence when confronted with currency problems in modern developed economies. The financial crisis in Mexico in 1995 showed once more that IMF funds are now unequal to the vast amounts of private capital circulating in the world economy. Nonetheless, it now has an important role in developing economics as a facilitator of the transition to full participation in the world economy.

Organization

The board of governors, made up of leading monetary officials from each of the member nations, is the highest authority in the IMF. Day-to-day operations are the responsibility of the 22-member executive board, which represents member nations individually (for larger countries) or in groups. The managing director chairs the executive board. Main headquarters is in Washington, D. C

Text 9

Lloyd's of London

Lloyd's, the biggest insurance business in the U.K. and in the world, is not a company, but an association of London underwriters. It was incorporated in 1871 and it is so called from Edward Lloyd.

Edward Lloyd was the owner of a coffee house where underwriters at that time met to do business.

Lloyd's is regulated by several Acts of Parliament and by its own rules. It is administered by the Council of Lloyd's. Today more than 20 000 members of Lloyd's in 80 countries work for Lloyd's. Underwriting members or underwriters are grouped into 280 syndicates, generally specializing in particular types of risks. The syndicates vary in size from the relatively small units to the units of several thousand individuals. Insurance is usually undertaken through Lloyd's brokers rather than directly with Lloyd's underwriting members. Lloyd's brokers know better what syndicate to approach and how to negotiate the business. They act, like other brokers, and negotiate on behalf of their customers. They do not bear any risks, since only underwriting members bear all the risks with unlimited liability. One of the main principles of insurance with Lloyd's is the spreading of risk as widely as possible among syndicates to minimize their losses. Lloyd's is best known as a centre of marine insurance, but at the same time all kinds of insurance are practised there. In fact, at the present day marine insurance comprises less than half the total business undertaken. Almost anything can be insured there as well: aircraft, communication satellites, civil engineering projects, livestock and so on.

Besides they do some business in travels, publishing and land. It exists because it has evolved over the centuries to meet the needs of the day. Lloyd's motto *Fidentia* means confidence in the future.

Text 10**Captains of Industry**
The Land of Opportunities

This was a period of great opportunities for enterprising young men. Most of the factories were one-storey buildings, so it was easy to get in on the ground floor. As soon as additional stories were built, those who had started at the bottom worked their way up.

Cornelius Vanderbilt

Vanderbilt made his money in ships. Thus, while others became captains of industry he became a commodore. He also bought up railway so that he could always be sure of getting a lower berth. His control of carts and cartels gave him a virtual monopoly of transportation. One of his favorite expressions, which endeared him to everyone, was 'The public be damned'.

Andrew Carnegie

Carnegie made his money in steel. Although he was a mild, soft-spoken man, his steel had quite a temper. Most of it was made in open hearths, then fashionable in the better homes of Pittsburgh. Thanks largely to Carnegie's efforts, steel rapidly came to replace wood in almost everything but trees. In a short while Carnegie, who had come to this country as a poor boy from Scotland, amassed such wealth that he was loved by everyone. He was especially popular because of his determination to give away all his money before he died. In order to succeed in this, he was forced to retire early, since he was making money faster than he could give it away. He is best remembered for having given away libraries, with his name on them, in which everyone was asked to be quiet out of respect for the donor. Carnegie was well known for his philanthropy that he became an Institution.

John d. Rockefeller

Rockefeller made his money in oil, which he discovered at the bottom of wells. Oil was crude in those days, but so was Rockefeller. Now both are considered quite refined. Almost everyone called Rockefeller 'John D'. A few called him something else, but not to his face. He was admired for his skill in a game called Monopoly, which was an effective way of eliminating competitors and establishing a single standard, such as Standard Oil.

Rockefeller's huge fortune seemed even larger than it was because he kept it in dimes.

J.P.Morgan

Morgan, who was a direct sort of person, made his money in money. He lived in an airy mansion, full of bank drafts, called the House of Morgan. One of the gayest people in the house was Helen Morgan, who sat on top of the piano when she sang.

An ingenious invention of Morgan's was a means of floating government loans, which made it possible to send large sums of money across the Atlantic without using ships. He became immensely wealthy because of his financial interests, most of which were around eight or ten per cent. This Morgan is usually spoken of as 'J.P.' to distinguish him from Henry Morgan, the pirate.

Henry Ford

Henry Ford manufactured one of the early automobiles, known as the Model T. This led to such modern conveniences as traffic signals, parking meters, back-seat drivers, and carbon monoxide. In the time it came to replace the horse for almost all purposes except horse racing and horsemeat. An idealist and a dreamer, this great inventor dreamed of two cars in every garage - both of them Fords. Henry Ford was found of saying, 'History is bank'. Historians, in turn, called Henry Ford 'a damned old crankshaft'.

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ГРАММАТИЧЕСКИЙ СПРАВОЧНИК

1. АРТИКЛЬ

Определенный артикль

В английском языке определенный артикль имеет только одну форму – **the**, независимо оттого, стоит ли существительное в единственном или во множественном числе и обозначает одушевленное или неодушевленное существительное:

the woman	<i>женщина</i>	the table	<i>стол</i>
the boy	<i>мальчик</i>	the cars	<i>автомашины</i>

- Перед словами, которые начинаются с согласного звука (d, f, s, v и т.д.), **the** произносится [Dɪ]
- Перед словами, которые начинаются с гласного звука (передаваемого буквами a, e, i, o, u) **the** [Dɪ]. Такая форма произношения употребляется также для эмпатического выделения существительного.

Употребление определенного артикля

Обычно абстрактные существительные употребляются без определенного артикля **the**:

anger	<i>гнев</i>	luck	<i>удача</i>
fear	<i>страх</i>	man	<i>мужчина</i>
happiness	<i>счастье</i>	politics	<i>политика</i>
hate	<i>ненависть</i>	society	<i>общество</i>
love	<i>любовь</i>	work	<i>работа и т.д.</i>

Fear is a negative emotion.

Страх – негативная эмоция.

What's the secret of true **happiness**?

В чем секрет истинного счастья?

Однако, если после абстрактных существительных, таких, как **hate, luck** и др., стоит поясняющее их слово, то перед этими существительными ставится артикль **the**:

His book is about **the fear of spiders**.

Его книга о страхе, вызываемом пауками.

I can't describe **the happiness I felt**.

Я не могу описать счастье, которое я почувствовал.

Слова, подобные следующим, употребляются без **the**, если они рассматриваются как учреждение или если подчеркивается их назначение. Только в том случае, когда имеется в виду конкретное здание или предмет, используют **the**:

school	<i>школа</i>	hospital	<i>больница</i>
college	<i>колледж</i>	court	<i>суд</i>
university	<i>университет</i>	prison	<i>тюрьма</i>
church	<i>церковь</i>	bed	<i>кровать</i>

He's been **in hospital** for a week.

Он лежит в больнице неделю.

There was a bomb scare **at the hospital** this morning.

Сегодня утром в больнице была опасность взрыва бомбы.

- Имена, фамилии отдельных людей, а также слова, обозначающие родство, употребляются без **the**. Артикль также не ставится, если перед такими существительными стоит прилагательное или звание (должность):

Dad <i>отец</i>	Grandma <i>бабушка</i>	Peter <i>Питер</i>
Dr. Brown <i>Др. Браун</i>	poor Sally <i>бедная Сэлли</i>	

Если существительное, обозначающее фамилию, стоит во множественном числе, т.е. имеются в виду все члены семьи, перед ним ставится определенный артикль:

the Smedleys <i>семья Смедли</i>	the Johnsons <i>Джонсоны</i>
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- Названия стран, улиц, зданий, гор, морей и озер и т.д. употребляются, как правило, без **the**:

Turkey	Турция	Windsor Castle	Виндзорский замок
Switzerland	<i>Швейцария</i>	Lake Geneva	<i>Женевское озеро</i>
Mount Fuji	<i>гора Фуджи</i>	Dunstan Road	<i>Данстан роуд</i>
K2	<i>K2</i>	Times Square	<i>Тайм сквер</i>

- Если название стоит во множественном числе, оно употребляется с определенным артиклем:

the Alps	<i>Альпы</i>	the Balearics	<i>Балеарские острова</i>
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- Названия месяцев, а также дней недели и праздников употребляются без **the**:

on Monday	<i>в понедельник</i>	in September	<i>в сентябре</i>
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Однако, если обозначение времени уточняется определением, то используется **the**:

on the Saturday of the wedding
the Easter that we spent in Bonn

в субботу, когда была свадьба
Пасха, которую мы провели в Бонне

- Названия трапез употребляются, как правило, без **the**, если только нет определения:

Dinner is at eight.
No: The dinner he served was awful.

Ужин в 8 часов.
Ужин, который он подал, был ужасен.

- Транспортные средства, употребленные с предлогом **by**, не имеют артикля **the**:

by car, by bus, by train
by bike/bicycle, by motorbike

машиной, автобусом, поездом
велосипедом, мотоциклом

Место определенного артикля

The следует за **half** *половина*, **double** *двойной*, **twice** *двойной* и **all** *все, всё*:

half the time

половина времени

twice the distance

двойное расстояние

double the price

двойная цена

all the time

все время

both boys или **both the boys**

оба мальчика

Most обычно употребляется без **the**:

Most people don't **know** about it.

Большинство людей не знают об этом.

Most of the+ имя существительное употребляется, если речь идет о большей части определенной группы предметов или лиц:

Most of the apples were rotten.

Большая часть яблок была гнилой.

Неопределенный артикль

Неопределенный артикль **a** ставится перед словами, которые начинаются с согласных (g, m, p, s и т.д.) и со звука [j]: **union** ['jʏnʏjʏn], **university** ['jʏni'vʏsiti] и т.д.

Перед словами, которые начинаются с гласных (a, e, i, o, u) ставится неопределенный артикль **an**. Артикль **an** ставится и перед словами, начинающимися с буквы **h**, если она не произносится, как, например, в **hour** ['auə].

a baby	<i>младенец</i>	an airport	<i>аэропорт</i>
a policeman	<i>полицейский</i>	an elephant	<i>слон</i>
a useful tip	<i>полезный намек</i>	an hour	<i>час</i>

1.2.1 Употребление неопределенного артикля

Неопределенный артикль **a/an** употребляется с существительными, обозначающими профессию, национальность, религию или принадлежность к какой – нибудь группе:

I'm a Methodist.	<i>Я методист (член церкви методистов).</i>
She's an opera singer.	<i>Она оперная певица.</i>
He's a Canadian.	<i>Он канадец.</i>

При указании цены, скорости, частоты используют **a/an** вместо русских предлогов *за/в*:

Calls cost 8 pence a minute.	<i>Телефонный звонок стоит 8 пенсов за минуту.</i>
I have to take this medicine five times a day.	<i>Я должен принимать лекарство 5 раз в день.</i>

Перед словами **hundred** и **thousand** ставится неопределенный артикль **a** или для подчеркивания значения: **one** (*один, одна*).

Only a hundred and twenty days left.	<i>Осталось всего 120 дней.</i>
A millennium is a thousand years.	<i>Миллениум означает тысячелетие.</i>

A/an не используется со словами **information** (*информация, сведение, сведения*), **advice** (*совет, советы*), **news** (*сообщение, сообщения*), **hand luggage** (*ручной багаж*).

Вместо артикля используется слово **some**, а в вопросительных и отрицательных предложениях – **any**, или совсем ничего. Если нужно подчеркнуть, что речь идет о «единице» информации и т.д., то можно также поставить перед существительным **a/ one piece of**:

He's got news for us.	<i>У него есть для нас сообщение (новости).</i>
I've got one piece of hand luggage .	<i>У меня только одно место ручного багажа</i>

Have you got **any advice**?

Вы можете дать мне совет?

Перед следующими словами неопределенный артикль **a/an** не используется. Вместо него говорят **some/any, a pair of** или нулевой артикль

(a pair of) trousers	<i>брюки</i>
(a pair of) jeans	<i>джинсы</i>
(a pair of) shorts	<i>шорты</i>
(a pair of) pyjamas	<i>пижама</i>
(a pair of) pants	<i>трусы, амер. брюки</i>
(a pair of) swimming trunks	<i>плавки</i>
(a pair of) glasses	<i>очки</i>
(a pair of) binoculars	<i>бинокль</i>
(a pair of) scissors	<i>ножницы</i>
(a pair of) scales	<i>весы</i>

Неопределенный артикль ставится после **half** и **quite** и, факультативно, перед или после **rather**:

It weights half a kilo .	<i>Весит полкило.</i>
They made quite a noise .	<i>Они довольно сильно шумели.</i>
She's rather a nice/ a rather nice teacher.	<i>Она довольно хороший преподаватель.</i>

2. ИМЯ СУЩЕСТВИТЕЛЬНОЕ

Написание имен существительных с прописной буквы

Как правило, английские имена существительные пишутся со строчной буквы, однако исключения составляют:

Имена собственные, обращения, ученые звания и титулы (перед фамилией):	Fred	<i>Фред</i>
	Mrs Tandy	<i>миссис Тенди</i>
	Inspector Morse	<i>инспектор Морс</i>
Названия дней недели и месяцев:	Thursday	<i>четверг</i>
	April	<i>апрель</i>
Названия народов и языков:	the Chinese	<i>китайцы</i>
	the Irish	<i>ирландцы</i>
	the Germans	<i>немцы</i>
	French	<i>французский</i>
	Thai	<i>тайский</i>
	Greek	<i>греческий</i>
Названия населенных пунктов, городов и стран:	Moscow	<i>Москва</i>
	Florida	<i>Флорида</i>
	Spain	<i>Испания</i>
Названия праздников:	Christmas	<i>Рождество</i>
	New Year's Eve	<i>канун Нового года</i>
	Thanksgiving Day	<i>день благодарения</i>
Названия религий и их последователей:	Buddhism	<i>буддизм</i>
	Christianity	<i>христианство</i>
	Hindu	<i>индус</i>
	Muslim	<i>мусульманин</i>
	Protestant	<i>протестант</i>
Названия исторических событий:	the Boer War	<i>Бурская война</i>
	the Maastricht Treaty	<i>Маастрихтский договор</i>
Названия организаций и учреждений:	the Wine Society	<i>Винное общество</i>
	the Royal Air Force	<i>Королевские воздушные силы</i>
Названия книг, фильмов, музыкальных произведений, произведений искусства и т.д.:	the Little Prince	<i>Маленький принц</i>
	the Laughing Cavalier	<i>Смеющийся кавалер</i>

Названия учебных предметов и дисциплин (иногда они пишутся со строчной буквы):

Maths	<i>математика</i>
Geography	<i>география</i>
History	<i>история</i>
Biology	<i>биология</i>
Medicine	<i>медицина</i>
Media Studies	<i>изучение средств массовой информации</i>

Английское местоимение «я» всегда пишется прописной буквой **I**.

Грамматический род имен существительных

Неодушевленные имена существительные в английском языке – среднего рода.

При обозначении профессии женщин, для подчеркивания пола или того, чтобы избежать недоразумений, перед названием профессии ставится одно из следующих слов: **woman** *женщина*, **lady** *леди*, причем употребление **female** и **woman** звучит скорее буднично, а **lady** – более вежливо:

(female) politician	(female/lady) doctor
<i>женщина – политик</i>	<i>женщина – врач</i>
(female) student	(woman/female) teacher
<i>студентка</i>	<i>преподавательница</i>

При обозначении профессий, которые раньше были почти исключительно женскими, если имеется в виду мужчина, для того, чтобы избежать недоразумения, часто добавляют слово **male**.

model	<i>манекенищица</i>	(male) model	<i>манекенищик</i>
nurse	<i>медсестра</i>	(male) nurse	<i>медбрат</i>
midwife	<i>акушерка</i>	(male) midwife	<i>акушер</i>

Некоторые имена существительные явно относятся к одному какому-то роду – либо к мужскому, либо женскому:

boyfriend	<i>друг</i>	girlfriend	<i>подруга</i>
prince	<i>принц</i>	princess	<i>принцесса</i>

Другие имена существительные имеют как форму мужского, так и женского рода, однако «нейтральная» форма может обозначать и женщин:

actor	<i>актер (актриса)</i>	actress	<i>актриса</i>
waiter	<i>официант (официантка)</i>	waitress	<i>официантка</i>

host	хозяин (хозяйка)	hostess	хозяйка
manager	заведующий (заведующая)	manageress	заведующая

2.3 Множественное число

2.3.1 Образование множественного числа

Форма множественного числа имен существительных в большинстве случаев образуется добавлением –s к форме единственного числа:

letter	письмо	letters	письма
house	дом	houses	дома

форма множественного числа имен существительных, оканчивающихся на -s, -ss, -sh, -ch или -x, образуется прибавлением -es к форме единственного числа:

bus	автобус	buses	автобусы
boss	босс	bosses	боссы
dish	блюдо	dishes	блюда
witch	ведьма	witches	ведьмы
fax	факс	faxes	факсы

У имен существительных, которые оканчиваются на букву –y, стоящую после согласных (d, g, s и т.д.), во множественном числе –y меняется на -ies :

baby	младенец	babies	младенцы
fly	муха	flies	мухи

Если –y стоит в конце слова после гласной (a, e, I, o, u), то прибавляется только –s:

boy	мальчик	boys	мальчики
day	день	days	дни

2.3.2 Нестандартные формы множественного числа

Имена существительные, которые оканчиваются на –f или –fe, меняют – f/ – fe во множественном числе на – ves:

wife	жена	wives	жены	knife	нож	knives	ножи
loaf	булка	loaves	булки	life	жизнь	lives	жизни

Исключения: roof крыша – roofs крыши

handkerchief *платок* – **handkerchiefs** *платки*.

Некоторые существительные на **-f** или **-fe** образуют формы множественного числа прибавлением как **-ves**, так и **-s**:

scarf	<i>шарф</i>	scarves/scarfs	<i>шарфы</i>
dwarf	<i>карлик</i>	dwarves/dwarfs	<i>карлики</i>
hoof	<i>копыто</i>	hooves/hoofs	<i>копыта</i>

Многие имена существительные, которые оканчиваются на **-o**, образуют формы множественного числа прибавлением **-es**:

tomato	<i>помидор</i>	tomatoes	<i>помидоры</i>
potato	<i>картофелина</i>	potatoes	<i>картофелины</i>
hero	<i>герой</i>	heroes	<i>герои</i>

Другие имена существительные образуют множественное число прибавлением **-s**:

Сокращенные варианты слов, например,

photo	<i>фотография</i>	photos	<i>фотографии</i>
kilo	<i>килограмм</i>	kilos	<i>килограммы</i>

Названия народов, например,

Eskimo	<i>эскимос</i>	Eskimos	<i>эскимосы</i>
Navajo	<i>индеец навахо</i>	Navajos	<i>индейцы навахо</i>
Filipino	<i>филиппинец</i>	Filipinos	<i>филиппинцы</i>

Иностранные слова, например,

macho	<i>мужественный человек</i>	machos	<i>мужественные люди</i>
piano	<i>пианино</i>	pianos	<i>пианино</i>
fiasco	<i>фиаско</i>	fiascos	<i>фиаско</i>

Слова, которые оканчиваются на **-eo** или **-io**, например,

studio	<i>студия</i>	studios	<i>студии</i>
video	<i>видео</i>	videos	<i>видео</i>

Некоторые имена существительные, оканчивающиеся на **-o**, могут иметь обе формы множественного числа (**-oes** или **-os**):

mango	<i>манго</i>
mosquito	<i>москит</i>
tornado	<i>торнадо</i>

volcano	вулкан
zero	ноль
motto	девиз
buffalo	бизон

Существительное **man** имеет во множественном числе форму **men**, также изменяются и сложные слова, оканчивающиеся на **man**:

Dutchman	датчанин	Dutchmen	датчане
Scotsman	шотландец	Scotsmen	шотландцы
chairman	председатель	chairmen	председатели

То же в случае **woman** женщина – **women** ['wimin] женщины.

Исключения: **Norman** норманн – **Normans** норманны,
Roman римлянин – **Romans** римляне.

Исключения: Следующие слова имеют совершенно нестандартно образованные формы множественного числа:

child	ребенок	children	дети
foot	ступня	feet	ступни
goose	гусь	geese	гуси
tooth	зуб	teeth	зубы
mouse	мышь	mice	мыши
louse	вошь	lice	вши

Следующие слова имеют во множественном числе ту же форму, что и в единственном числе:

sheep	овца	sheep	овцы
fish	рыба	fish	рыбы
trout	форель	trout	форели
deer	олень	deer	олени
salmon	лосось	salmon	лососи

Встречается и форма множественного числа **fishes**, когда имеются в виду различные виды рыб.

Не изменяются во множественном числе и слова, обозначающие национальность, оканчивающиеся на **–ese** или **–ss**:

Swiss	швейцарец	Swiss	швейцарцы
Chinese	китаец	Chinese	китайцы
Japanese	японец	Japanese	японцы

У некоторых сложных слов, особенно состоящих из существительного и предлога, первый элемент получает окончание множественного числа. К ним относятся:

mother – in – law	<i>свекровь, теща</i>	mothers – in – law	<i>свекрови, тещи</i>
passerby	<i>прохожий</i>	passersby	<i>прохожие</i>

У некоторых сложных слов оба элемента получают окончания множественного числа:

woman driver	<i>женщина– водитель</i>	women drivers	<i>женщины– водители</i>
woman priest	<i>женщина– священник</i>	women priests	<i>женщины– священники</i>

2.3.3 Употребление множественного числа

Предметы, которые состоят из двух равных частей, всегда употребляются во множественном числе:

trousers	<i>брюки</i>	glasses	<i>очки</i>
jeans	<i>джинсы</i>	spectacles	<i>очки</i>
pyjamas	<i>пижама</i>	binoculars	<i>бинокль</i>
pants	<i>трусы</i>	dentures	<i>зубной протез</i>
briefs	<i>шорты</i>	scissors	<i>ножницы</i>
swimming trunks	<i>плавки</i>	pliers	<i>щипцы</i>
tights	<i>колготки</i>		

Только во множественном числе употребляются следующие слова:

clothes	<i>одежда</i>	headquarters	<i>штаб</i>
thanks	<i>спасибо</i>	outskirts	<i>городская окраина</i>
congratulations	<i>поздравления</i>	goods	<i>товары</i>
Middle Ages	<i>Средние века</i>	looks	<i>наружность</i>

Все эти слова употребляются с глаголами в форме множественного числа.

Headquarters встречается также с глаголом в единственном числе.

Police (*полиция, полицейские*) несмотря на форму единственного числа имеет значение **множественного числа**.

Следующие слова никогда не употребляются в форме множественного числа и всегда употребляются с глаголами в единственном числе:

information	<i>сведение (-ия)</i>	news	<i>новость (-ти)</i>
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advice	<i>совет (-ы)</i>	progress	<i>прогресс</i>
knowledge	<i>знание (-ия)</i>	furniture	<i>мебель</i>

Многие существительные, являющиеся собирательными, т.е. обозначающие группы (обычно людей), могут рассматриваться и как формы единственного числа, и как формы множественного числа, в зависимости от того, идет ли речь о группе как о едином целом (единственное число) или об отдельных ее членах (множественное число):

class	<i>класс</i>	crowd	<i>толпа</i>
company	<i>компания</i>	army	<i>армия</i>
crew	<i>экипаж</i>	public	<i>общественность</i>
team	<i>команда</i>	staff	<i>персонал</i>
party	<i>партия</i>	family	<i>семья</i>
audience	<i>зрители, аудитория</i>	orchestra	<i>оркестр</i>

Имена существительные, оканчивающиеся на **-ics** и обозначающие учебные дисциплины или области науки, являются формами единственного числа:

acoustics	<i>акустика</i>	physics	<i>физика</i>
statistics	<i>статистика</i>	economics	<i>экономика</i>
maths, mathematics	<i>математика</i>	athletics	<i>атлетика</i>
linguistics	<i>лингвистика</i>	politics	<i>политика</i>
		gymnastics	<i>гимнастика</i>

Многие из них, например economics, politics, acoustics, statistics, если они не обозначают учебную дисциплину или отрасль науки, могут употребляться и как формы множественного числа:

The acoustics in this church **are** not very good. *Акустика в этой церкви не очень хорошая.*

2.3 Притяжательный падеж

Образование притяжательного падежа:

- К форме единственного числа имен существительных, обозначающих людей и животных, прибавляют **-'s**:

the man's car	<i>машина мужчины</i>
our dog's puppies	<i>щенки нашей собаки</i>
Simon's room	<i>комната Симона</i>

- К формам, уже оканчивающимся на – s, добавляют –‘s или только апостроф –‘:

Mr Aldiss’s house/ Mr Aldiss’ house дом господина Элдиса

- К форме множественного числа имен существительных, обозначающих людей и животных, если она уже оканчивается на – s, прибавляется апостроф:

the boys’ socks носки мальчиков
my parents’ records пластинки моих родителей

- Если форма множественного числа образована каким –нибудь другим способом, (а не при помощи – s), - ‘s прибавляется:

the children’s pets любимые домашние животные детей
women’s clothes женские одежды
the mice’s diet пища мышей

- Неодушевленные существительные не имеют формы притяжательного падежа, перед ними обычно ставят **of the**:

the end of the journey конец путешествия
at the top of the cupboard на верху шкафа

2.4.1 Употребление притяжательного падежа

Некоторые неодушевленные существительные могут употребляться не только с **of the**, но также с –‘s. Эту форму особенно часто имеют существительные, обозначающие названия населенных пунктов и стран, а также время, например, **today** (сегодня), **yesterday** (вчера), **tomorrow** (завтра), **last week** (на прошлой неделе) и т.д.

Bordeaux’s wine estates are famous.	Виноградники Бордо всемирно известны.
Tomorrow’s match is going to be very exciting.	Завтрашний матч будет очень интересным.
Teachers’ pay is not very high.	Зарплата преподавателей не очень высокая.

В выражениях времени притяжательный падеж с –‘s употребляется, если за существительным, обозначающим время, следует еще одно существительное:

in a week’s time	через неделю
an hour’s delay	опоздание на один час
a minute’s silence	минутное молчание

a day's work

работа одного дня

3. МЕСТОИМЕНЕНИЯ

3.1 Личные местоимения

В английском языке личные местоимения могут использоваться в функции подлежащего и дополнения:

Подлежащее		Дополнение	
I	я	me	меня, мне, мной
you	ты	you	тебя, тебе, тобой
he	он	him	его, ему, им, (о) нем
she	она	her	ее, ей, ею, (о) ней
it	он, она, оно	it	его, ему, им, (о) нем, ее, ей, ею, (о) ней
we	мы	us	нас, нам, нами
you	вы	you	вас, вам, вами
they	они	them	их, им, (о них)

- Кроме людей, которым соответствуют разные местоимения в зависимости от пола (he или she), названия домашних животных, а также других животных, к которым испытывают какие – либо чувства или чей пол хотят подчеркнуть, могут обозначаться местоимениями he или she:
- О животных, которые рассматриваются бесстрастно и пол которых не имеет значения говорят **it**.
- Предметам и понятиям в обыденной речи обычно соответствует местоимение it. О машинах, лодках и кораблях, как правило, говорят как об относящихся к женскому роду.

- What's your rabbit's name?

- Как зовут вашего кролика?

- **She's** called Fluffy.

- Ее зовут Флаффи.

You don't have to kill the spider – just put **it** outside.

Вы не должны убивать паука, просто выбросьте его.

После некоторых глаголов перед личными местоимениями могут опускаться предлоги **to** и **for**. В этом случае местоимение следует непосредственно за глаголом.

К таким глаголам обычно требующим **to**, относятся, например, следующие: **bring** (приносить), **give** (давать), **hand** (вручать), **lend** (давать в долг), **offer** (предлагать), **owe** (быть обязанным), **pass** (передавать), **promise** (обещать), **sell** (продавать), **send** (посылать), **show** (показывать), **teach** (обучать), **tell** (рассказывать), **write** (писать).

К глаголам, обычно требующим **for**, относятся, например, следующие: **buy** (покупать), **cook** (готовить еду), **fetch** (доставать), **find** (находить), **get** (доставать), **leave** (покидать, уезжать в), **make** (делать), **save** (экономить, спасать, сохранять).

We gave the plant **to them**.

Мы подарим им это растение.

We gave **them** the plant.

She saved a few bottles **for me**.

Она сохранила несколько бутылок для меня.

She saved **me** a few bottles.

Если оба прямых дополнения являются местоимениями, возможны следующие варианты порядка слов:

We gave it **to them**.

Мы дали его им.

We gave **them** it.

She saved them **for me**.

Она сохранила их для меня.

She saved **me** them.

3.2 Притяжательные местоимения

3.2.1 Притяжательные местоимения – прилагательные

В английском языке такие притяжательные местоимения не изменяются:

my	<i>мой (моя, мое, мои и т.д.)</i>
your	<i>твой (и т.д.)</i>
his	<i>его</i>
her	<i>ее</i>
its	<i>его, ее</i>
our	<i>наши и т.д.</i>
your	<i>ваши и т.д.</i>
their	<i>их</i>

3.2.2 one's

Неопределенному местоимению **one** соответствует притяжательное местоимение **one's**, которое всегда пишется с апострофом:

One has to look after one's health in old age. *В старости надо следить за своим здоровьем.*

3.2.3 Абсолютная форма притяжательных местоимений

Абсолютная форма притяжательных местоимений заменяет притяжательное местоимение + существительное (например, **his wife** его жена). За исключением

mine и **his**, она образуется добавлением –s к притяжательному местоимению (местоимению – прилагательному):

mine	<i>мои, моя, мое, моего и т.д.</i>
yours	<i>твой, твоя, твое и т.д.</i>
his	<i>его</i>
hers	<i>ее</i>
its	<i>его, ее</i>
ours	<i>наши и т.д.</i>
yours	<i>ваши и т.д.</i>
theirs	<i>их</i>

That's her house, this is ours.

Тот дом ее, этот дом наш.

3.3 Возвратные местоимения

Возвратные местоимения в английском языке соответствуют в русском языке местоимению «себя (себе, собой)» или возвратной частичке –ся , которые ставятся после глагола:

I could cut myself.	<i>Я мог порезаться (порезать себя).</i>
You could cut yourself.	<i>Ты мог порезаться (порезать себя).</i>
He could cut himself.	<i>Он мог порезаться (порезать себя).</i>
She could cut herself.	<i>Она могла порезаться (порезать себя).</i>
It could cut itself.	<i>Он/Она/Оно мог/могла/могло порезаться (порезать себя).</i>
We could cut ourselves.	<i>Мы могли порезаться (порезать себя).</i>
You could cut yourselves.	<i>Вы могли порезаться (порезать себя).</i>
They could cut themselves.	<i>Они могли порезаться (порезать себя).</i>

3.3.1 Употребление возвратных местоимений

Некоторые английские глаголы, в отличии от соответствующих русских глаголов, не могут употребляться с возвратными местоимениями. К ним относятся:

concentrate	<i>концентрироваться</i>
meet	<i>встречаться</i>
move	<i>двигаться</i>
hurry (up)	<i>торопиться</i>
dress/ get dressed	<i>одеваться</i>
change/ get changed	<i>изменяться</i>
wash/ get washed	<i>умываться</i>
get ready	<i>готовиться</i>
be interested in	<i>интересоваться</i>

3.3.2 *each other/ one another*

Русским выражениям «взаимно» или «друг друга», «друг с другом», «друг о друге» в английском языке соответствуют **each other** (если речь идет о двух действующих лицах) или **one another** (при двух или большем количестве действующих лиц):

Why do they have to shout at each other?	<i>Почему они должны кричать друг на друга?</i>
All the villagers helped one another during the floods.	<i>Во время наводнения все жители деревни помогали друг другу.</i>

3.3.3 *себя = her, him, us и т.д.*

В английском языке после предлогов места употребляются, как правило, личные местоимения **me, her, them** и т.д.:

He hasn't got any money on him.	<i>У него нет никаких денег при себе.</i>
She hid the briefcase behind her.	<i>Она спрятала портфель позади себя.</i>

3.4 Указательные местоимения

- **This** (единственное число) и **these** (множественное число) указывают большей частью на кого-то или что-то, близкое к говорящему (также по времени).
- **That** (единственное число) **those** (множественное число) указывают часто на кого-то или что-то, удаленное от говорящего (также по времени).

Тем не менее выбор между **this/ these** и **that/those** часто очень субъективен:

Is this his desk?	<i>Это (здесь) его письменный стол?</i>
What are these glasses doing here?	<i>Что здесь делают эти стаканы?</i>
That's my school.	<i>Это моя школа</i>
Did you water those plants on the window-sill?	<i>Вы полили те растения на подоконнике</i>

That или **those** могут использоваться также для того, чтобы эмоционально усилить высказывание:

I hate those jeans!	<i>Я ненавижу эти джинсы!</i>
You should be much stricter with that boy!	<i>Вы должны быть более строги к этому мальчику!</i>

4. ИМЯ ПРИЛАГАТЕЛЬНОЕ

4.1 Форма имен прилагательных

В английском языке прилагательное в положительной степени имеет всегда одну и ту же форму, независимо от того, относится ли оно к мужчине или женщине, к существительному в единственном или множественном числе:

a nice boy	<i>приятный мальчик</i>
a nice girl	<i>приятная девочка</i>
a nice family	<i>приятная семья</i>
nice children	<i>приятные дети</i>

4.2 Степени сравнения прилагательных

Односложные прилагательные образуют сравнительную и превосходную степени с помощью суффиксов -er/ -est:

Положительная степень	Сравнительная степень	Превосходная степень
long <i>длинный</i> (-ая, -ое, -ого и т.д.)	longer <i>длиннее</i> (более длинный)	the longest <i>длиннейший</i> (самый длинный)
clean <i>чистый</i>	cleaner <i>чище</i> (более чистый)	the cleanest <i>чистейший</i> (самый чистый)

- Если в конце слова после краткого гласного стоит только одна гласная, она удваивается:

big	большой	bigger	biggest
fat	толстый	fatter	fattest

- Если прилагательное оканчивается на немое –е, то прибавляется только -r/ -st:

close	близкий	closer	closest
-------	---------	--------	---------

Двусложные прилагательные, оканчивающиеся на -er, -le, -ow или -y, также прибавляют -er/-est. Конечное –у меняется на -i-:

Положительная степень	Сравнительная степень	Превосходная степень
clever <i>умный</i>	cleverer	cleverest
simple <i>простой</i>	simpler	simplest
hollow <i>пустой</i>	hollower	hollowest
funny <i>смешной</i>	funnier	funniest

Исключение:

eager *нетерпеливый* more eager most eager

Другие двусложные и многосложные прилагательные также образуют степени сравнения с помощью **more/most**:

Положительная степень	Сравнительная степень	Превосходная степень
helpful <i>полезный</i>	helpful	most helpful
impatient <i>нетерпеливый</i>	impatient	most impatient
incredible <i>невероятный</i>	more incredible	most incredible

Прилагательные (даже односложные), оканчивающиеся на **–ing** или **–ed**, образуют степени сравнения также с **more/most**:

charming <i>чудесный</i>	more charming	most charming
bored <i>скучающий</i>	more bored	most bored

Многие прилагательные могут образовывать формы степеней сравнения обоими способами. К таким прилагательным относятся:

handsome	<i>красивый</i>
polite	<i>вежливый</i>
quiet	<i>спокойный</i>
stupid	<i>глупый</i>
wicked	<i>злой</i>

He's **politer/ more polite** than you. *Он более вежлив, чем вы.*

Следующие прилагательные образуют формы степеней сравнения от другого корня:

Положительная степень	Сравнительная степень	Превосходная степень
bad <i>плохой</i>	worse	worst
good <i>хороший</i>	better	best
much <i>много</i>	more	most
many <i>многие</i>	more	most
little <i>немного</i>	less	least
little <i>маленький</i>	smaller	smallest
far <i>далекий</i>	further или farther	furthest или farthest

4.3 Другие способы выражения сравнения

такой же как – as ... as

You're as clever as your father.

Вы такой же умный, как ваш отец.

сравнительная степень + чем = *than*

She's taller than her mother.

Она выше, чем ее мать.

чем ... *тем* = *the* + сравнительная степень ... *the* + сравнительная степень

The fatter he gets, **the more** greedy he gets. *Чем толще он становился, тем алчнее.*

все более = -er and -er/ more and more ...

His beard is growing **longer and longer**. *Его борода становилась все более длинной (длиннее и длиннее).*

The story is becoming **more and more exciting**. *Рассказ становится все более интересным.*

менее + прилагательное = *less* + прилагательное

The exam was **less difficult** than I had expected. *Экзамен был менее трудным, чем я ожидал.*

4.4 Субстантивные прилагательные

Некоторые имена прилагательные могут использоваться как имена существительные. Они употребляются только во множественном числе с артиклем **the** и без **-s** на конце слова:

the rich	<i>богатые, богачи</i>
the poor	<i>бедные, бедняки</i>
the unemployed	<i>безработные</i>
the disabled	<i>инвалиды</i>

Сюда относятся также названия многих национальностей:

the Swiss	<i>швейцарцы</i>
the British	<i>британцы</i>
the Chinese	<i>китайцы</i>
the Dutch	<i>голландцы</i>
the French	<i>французы</i>

Если имеется в виду только один представитель этой группы, то после имени прилагательного должно стоять существительное, например, **boy** мальчик, **girl** девочка, **woman** женщина и т.д.

a poor boy	<i>бедный мальчик</i>
that rich man	<i>тот богатый человек</i>
a disabled person	<i>инвалид</i>
a French lady	<i>французская дама</i>

Некоторые прилагательные превратились в существительные (с —s во множественном числе):

a conservative	<i>консерватор</i>
a vegetarian	<i>вегетарианец/ вегетарианка</i>
a black	<i>негр/ негритянка</i>
a white	<i>белый/ белая</i>

Сюда же относятся названия некоторых национальностей и другие слова, обозначающие происхождение:

a German	<i>немец, немка</i>
an Austrian	<i>австриец, австрийка</i>
a Norwegian	<i>норвежец, норвежка</i>
a Scot	<i>шотландец, шотландка</i>
an Italian	<i>итальянец, итальянка</i>
a Venetian	<i>венецианец, венецианка</i>
a Glaswegian	<i>житель, жительница г. Глазго</i>

4.5 Заместитель имени существительного **one**

Чтобы не повторять исчисляемое имя существительное, вместо него употребляют **one** (единственное число) или **ones** (множественное число):

This sweater is a bit thin.	<i>Этот свитер немного тонок.</i>
Have you got a thicker one ?	<i>Нет ли у вас более толстого?</i>
- Would you like an olive?	<i>- Не хотите ли маслину?</i>
- No thanks, I only eat black ones .	<i>- Нет, спасибо, я ем только черные.</i>

5. НАРЕЧИЕ

Наречие – это слово, которое уточняет значение глагола, прилагательного, другого наречия или всего предложения целиком:

He writes quickly.

Он пишет быстро.

She hurts herself quite badly.

Она поранила себя довольно сильно.

Luckily he's a doctor.

К счастью, он врач.

Имеется два вида наречий:

- наречия, которые образованы от прилагательных и оканчиваются на *-ly* (например, *quickly быстро*, *easily легко*),
- наречия, образованные от других слов, например, *always всегда*, *soon скоро* и т.д

5.1 Образование наречий, оканчивающихся на *-ly*

Большинство производных наречий образуются прибавлением *-ly*, однако образование некоторых наречий имеет особенности:

-le изменяется на *-ly*: *simple – simply*

простой – просто

-y изменяется на *-ly*: *easy – easily*

легкий – легко

-ic изменяется на *-ically*: *automatic – automatically*

автоматический – автоматически

Исключение: *public – publicly*

публичный – публично

немое *-e* в прилагательных опускается в соответствующих наречиях:

true - truly

верный - верно

due - duly

надлежащий – надлежащим образом

whole - wholly

целый - целиком

full превращается в **fully** (*полный - полностью*)

Прилагательные, обозначающие период времени и оканчивающиеся на *-ly* (*daily ежедневный*, *weekly еженедельный*, *monthly ежемесячный*, *yearly ежегодный*, *hourly ежечасный* и т.д.), не отличаются по форме от соответствующих им наречий:

This is my daily ration of beer.

Это моя ежедневная порция пива.

The nurse visits him daily.

Медсестра посещает его ежедневно.

Следующие прилагательные и наречия также не отличаются друг от друга по форме и, как правило, имеют аналогичные значения:

Прилагательное		Наречие	
deep	<i>глубокий</i>	deep	<i>глубоко</i>
early	<i>ранний</i>	early	<i>рано</i>
far	<i>далекий</i>	far	<i>далеко</i>
fast	<i>быстрый</i>	fast	<i>быстро</i>
hard	<i>жесткий, тяжелый</i>	hard	<i>сильно, твердо, тяжело</i>
high	<i>высокий</i>	high	<i>высоко</i>
late	<i>поздний</i>	late	<i>поздно</i>
long	<i>длинный</i>	long	<i>долго</i>
low	<i>низкий</i>	low	<i>низко</i>
straight	<i>прямой</i>	straight	<i>прямо, непосредственно</i>
near	<i>близкий</i>	near	<i>близко</i>

Некоторые из этих наречий встречаются также с *-ly* на конце слова, но тогда они имеют другое значение:

deeply	<i>сильно</i>	lately	<i>последнее время</i>
hardly	<i>едва ли</i>	nearly	<i>почти</i>
highly	<i>очень</i>		

Значения следующих наречий также отличаются от значений соответствующих прилагательных:

barely	<i>едва, только</i>	mostly	<i>большой частью</i>
fairly	<i>довольно</i>	scarcely	<i>едва ли, как только</i>
justly	<i>законно</i>	shortly	<i>вскоре</i>

От некоторых прилагательных, оканчивающихся на *-ly*, нельзя образовать никакого соответствующего наречия. В таком случае нужно использовать подходящее выражение:

She gave me a friendly smile.
He gave me a silly look.

*Она дружелюбно улыбнулась мне.
Он смотрел на меня с глупым видом.*

Еще одна особенность:

Прилагательному *хороший* соответствует наречие **well** *хорошо*.

Некоторые слова имеют разные значения в зависимости от того, являются ли они прилагательными или наречиями:

Прилагательное		Наречие	
just	<i>справедливый</i>	just	<i>как раз, именно</i>
only	<i>единственный</i>	only	<i>только</i>
pretty	<i>красивый</i>	pretty	<i>довольно</i>

well	здоровый, хорошо себя чувствующий	well	хорошо
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5.2 Степени сравнения наречий

- Все односложные наречия, а также **early** *рано* образуют степени сравнения с помощью прибавления **-er/ -est**.
- Как и у прилагательных, немое **-e** на конце слова опускается перед **-r/ -st**, а конечное **-y** изменяется на **-i**:

Положительная степень	Сравнительная степень	Превосходная степень
fast <i>быстро</i>	faster	fastest
late <i>поздно</i>	later	latest
early <i>рано</i>	earlier	earliest

Двусложные и многосложные наречия (кроме **early**) образуют степени сравнения с помощью **more/ most**:

Положительная степень	Сравнительная степень	Превосходная степень
happily <i>счастливо</i>	more happily	most happily
regularly <i>регулярно</i>	more regularly	most regularly
often <i>часто</i>	more often	most often

Следующие наречия образуют степени сравнения от других корней:

Положительная степень	Сравнительная степень	Превосходная степень
well <i>хорошо</i>	better	best
badly <i>плохо</i>	worse	worst
much <i>много</i>	more	most
little <i>немного</i>	less	least
far <i>далеко</i>	further/ farther	furthest/ farthest

5.3 Другие способы выражения сравнения

- В английском языке *чем* при сравнении передается словом **than**:

She works less **than** me. *Она работает меньше, чем я.*

- *Так же ... как* передается парным союзом **as ... as**:

He's dressed **as** rich **as** his brother. *Он так же богато одет, как его брат.*

- Если после **than** или **as** идет личное местоимение, оно употребляется в объектном падеже:

He runs faster **than** me.

Он бежит быстрее меня.

She moves **as** slow **as** me.

Она такая же медлительная как я.

или в форме именительного падежа перед смысловым или вспомогательным глаголом:

She eats more **than I do**.

Она ест больше, чем я.

I saw as frightened **as he** was.

Я был так же сильно напуган, как и он.

После глаголов восприятия, если эти глаголы выражают состояние или качество, стоит, как правило, прилагательное вместо наречия (без -ly):

feel

чувствовать

sound

звучать

look

выглядеть

taste

иметь вкус

smell

пахнуть

It looks/ smells/ sounds good.

Это выглядит/ пахнет/ звучит хорошо.

6. ПОРЯДОК СЛОВ В ПРЕДЛОЖЕНИИ

Обычно в английском языке порядок слов в предложении следующий:

подлежащее	сказуемое	дополнение
Peter	is peeling	potatoes.
<i>Питер</i>	<i>чистит</i>	<i>картофель</i>

6.1 Место наречия в предложении

Наречия образа действия (отвечают на вопрос «как?») занимают, как правило, следующее положение:

- при переходных глаголах перед смысловым глаголом или после дополнения (наречие никогда не стоит между глаголом и прямым дополнением).
- при непереходных глаголах после глагола:

He **hurriedly** finished his tea.
She had **hardly** said a word.
They shouted her name **loudly**.
Everyone sat there **quietly**.

Он поспешно закончил пить чай.
Она едва ли сказала хоть одно слово.
Они громко выкрикнули ее имя.
Все сидели там спокойно.

Обстоятельства места (отвечают на вопрос «где?», «куда?») и **времени** (отвечают на вопрос «когда?») стоят большей частью

- в конце предложения
- в начале предложения для подчеркивания их значения; однако, обстоятельства, отвечающие на вопрос «куда?», не могут находиться на этом месте:

I'm going **to town**.
He's coming at **half past four**.

Я еду в город.
Он приезжает около половины девятого.

In Spain people eat quite late.
On Monday we fly to Cannes.

В Испании едят совсем поздно.
В понедельник мы летим в Канны.

Производные наречия (прилагательное + -ly), а также **наречия частотности** (**always** всегда, **usually** обычно, **never** никогда и т.д.) стоят, как правило:

- перед смысловым глаголом
- после глагола be или после первого вспомогательного глагола

Для подчеркивания их значения эти наречия могут быть поставлены и в начало предложения:

He usually sleeps until ten.	<i>Обычно он сидит до десяти.</i>
I'm always tired.	<i>Я всегда усталый.</i>
They had never seen their father.	<i>Они никогда не видели своего отца.</i>
Sometimes she stays indoors all day long.	<i>Иногда он остается дома весь день.</i>

Если в одном и том же предложении встречаются различные обстоятельства, то соблюдается следующая их последовательность:

- обстоятельство образа действия ставится перед обстоятельством места
- обстоятельство места предшествует обстоятельству времени
- более точные данные стоят перед более абстрактными

She slowly lifted the teapot out of the box .	<i>Она медленно вынула чайник из ящика.</i>
I'll be in the bar at nine .	<i>Я буду в баре в девять.</i>
They are getting married at ten o'clock on Saturday .	<i>Они сочетаются браком в субботу в десять часов.</i>

Если **наречие степени** (например, **very** очень, **quite** совсем, **too** слишком, **extremely** чрезвычайно, **a bit** немного) относится к прилагательному или другому наречию, то они стоят перед ним.

Если **наречия степени** (например, **almost** почти, **hardly** едва, **nearly** почти, **just** как раз и т.д.) относятся к глаголам, то они ставятся перед смысловым глаголом:

Our teacher is too strict .	<i>Наш преподаватель слишком строгий.</i>
I almost fell off the ladder.	<i>Я чуть не упал с лестницы.</i>
The match had hardly started when there was a heavy shower.	<i>Едва началась игра, хлынул ливень.</i>

6.2 Инверсия

Инверсия – это перестановка слов, нарушающая обычный порядок слов в предложении.

В следующих случаях глагол и подлежащее меняются местами:

- после **so** и **neither/nor** в начале предложения, означающих «также», «также не»
- после определенных наречий в начале предложения, в том числе:

never	<i>никогда</i>
not only	<i>не только</i>
only then	<i>только тогда</i>
no sooner + перестановка ... than	<i>как только ... (так)</i>
scarcely + перестановка ... when	<i>едва ..., как</i>
rarely, seldom	<i>редко</i>

I like it. – So do I.

I can't read. – Neither can I.

No sooner had I put the phone down than
the doorbell rang.

Rarely had he seen such a fine specimen.

Мне это нравится. – Мне тоже.

Я не умею читать. – Я тоже не умею.

*Не успел я положить телефонную
трубку, как раздался звонок в дверь.*

*Редко он видел такой прекрасный
экзмпляр.*

7. ВОПРОСИТЕЛЬНАЯ И ОТРИЦАТЕЛЬНАЯ ФОРМЫ

7.1 Вопросительная форма

Вопросительные предложения с глаголом **be**, а также с вопросительными глаголами **have, will, can, could, may, might, must, should, need** и **ought (to)** образуются перестановкой подлежащего и вспомогательного глагола. Смысловый глагол стоит после подлежащего.

Is he there?

Он там?

Can you help me?

Вы можете помочь мне?

Have you seen Michael?

Вы видели Майкла?

При всех других глаголах вопросительная форма образуется с помощью вспомогательного глагола **do/does** (в настоящем времени) или **did** (в прошедшем времени) + **подлежащее** + **неопределенная форма глагола** без частицы **to**. Остальные слова остаются в том же порядке, как в повествовательном предложении:

подлежащее + смысловый глагол + дополнение

He hates fish.

Он не любит рыбу.

Do/did/does + подлежащее + смысловый глагол + дополнение

Does he hate fish?

Вопросы с вопросительными словами **why** *почему*, **when** *когда*, **which** *который* и т.д. образуются также с **do/did/does** + **подлежащее** + **неопределенная форма глагола** без частицы **to**:

Why do they live there?

Почему они живут там?

Where does she work?

Где она работает?

When did you find out?

Когда вы узнали?

Исключение: если вопросительное слово является подлежащим или входит в состав подлежащего. В этом случае оно отвечает на вопрос «кто?», «что?», или «какой?», «который?», а за ним ставится смысловый глагол без вспомогательного глагола **do**:

Who told you that?

Кто рассказал вам об этом?

Which room is ours?

Какая комната наша?

7.2 Отрицательная форма

- В предложениях с **be** и вспомогательными глаголами **have, will, can, could, must, should, need** и **dare** краткая отрицательная форма образуется добавлением **–n't**.
- В отрицательной форме вспомогательных глаголов **may, might** и **ought (to)**, а также для эмфатического подчеркивания значения добавляют **not**, а не **–n't**. Встречаются и формы **mightn't** и **oughtn't**.
- **I am** или **I'm** превращается в **I'm not** под ударением также **I am not**.
- **I can** превращается в **I can't**, под ударением также **I cannot**.
- **I will** или **I'll** превращается в **I won't**, под ударением также **I will not**.

He isn't/He is not in.

Его здесь нет.

You shouldn't say that.

Вы не должны говорить это.

She won't open the door.

Она не откроет дверь.

They might not come.

Они, вероятно, не придут.

- Отрицательная форма других глаголов образуется с помощью **don't/doesn't/didn't** + неопределенная форма глагола без частицы **to**. То же самое происходит, если **have** является смысловым глаголом:

I have no books, или I don't have books. *У меня нет книг.*

- При подчеркивании значения отрицания или в официальном стиле **not** не сокращается:

It is not difficult to understand.

Это не трудно понять.

В британском варианте английского языка возможно употребление в настоящем времени двух разных отрицательных форм для **have** в значении «иметь, владеть»:

I haven't got/ don't have any money.

У меня нет денег.

7.3 Отрицательная форма вопросов

- Отрицательная форма вопросов образуется прибавлением **–n't** к первому глаголу (большой частью вспомогательному глаголу):
- **Are I** превращается в **aren't**.

Doesn't he speak English?

Разве он не говорит по-английски?

Haven't you got a handkerchief?

Неужели у вас нет носового платка?

Aren't I generous?

Разве я не великодушен?

7.4 Краткие ответы

В кратких ответах повторяется первый глагол (большой частью вспомогательный глагол) вопросительного предложения:

- | | |
|---------------------------|-----------------------|
| - Can I eat now? | - Могу я теперь есть? |
| - Yes, you can. | - Да (, можете). |
| - Do you like Chopin? | - Вам нравится Шопен? |
| - Yes, I do/ No, I don't. | - Да/ Нет. |

7.5 Разделительные вопросы

Эти вопросы состоят из повествовательного предложения, за которым следует краткий вопрос.

- В вопросах, в ответ на которые чаще всего ожидается утвердительный ответ («не правда ли?», «не так ли?» и т.д.), повторяются глаголы **be**, **have** и вспомогательные глаголы (**will**, **must**, **can**, **should** и т.д.).
- При утвердительном повествовательном предложении вопрос стоит в отрицательной форме, при отрицательном повествовательном предложении вопрос стоит в утвердительной форме:

- | | |
|---|---|
| You're a physicist, aren't you? | <i>Вы физик, не так ли?</i> |
| He can't speak Japanese, can he? | <i>Он не умеет говорить по-японски, не правда ли?</i> |

- Смысловые глаголы, кроме **be** и **have**, заменяются в разделительных вопросах соответствующей формой **do**.
- Итак, если повествовательное предложение является утвердительным, то вопрос стоит в отрицательной форме, и наоборот, если первая часть является отрицательной, вопрос стоит в утвердительной форме.

Можно порекомендовать сначала сформулировать «нормальный» вопрос, затем вторую часть разделительного вопроса:

- | | |
|-----------------------------|------------------------------------|
| Do you remember me? | <i>Ты меня помнишь?</i> |
| You remember me, don't you? | <i>Ты меня помнишь, не так ли?</i> |

8. ГЛАГОЛ

8.1 Настоящее время: простое и продолженное

8.1.1 Образование простого настоящего времени (*Present Simple*)

Формы простого настоящего времени совпадают с инфинитивом (без частицы *to*), кроме формы 3-го лица единственного числа (**he он**, **she она**, **it он, она, оно**, **the dog собака**, **my brother мой брат** и т.д.), где к инфинитиву добавляется **-s**:

talk – he talks	<i>говорить – он говорит</i>
run – she runs	<i>бежать – он бежит</i>
kick – the horse kicks	<i>лгаться – лошадь лгается</i>

Глаголы, которые оканчиваются на **-s**, **-sh**, **-ch** или **-x**, образуют форму 3 – го лица единственного числа прибавлением к инфинитиву **-es**:

miss – she misses	<i>пропускать – она пропускает</i>
push – it pushes	<i>толкать – он (она, оно) толкает</i>
catch – it catches	<i>ловить – он (она, оно) ловит</i>
fax – he faxes	<i>посылать по факсу – он посылает по факсу</i>

Глаголы, оканчивающиеся на согласные (**m**, **p**, **s**, **v** и т.д.) + **-y**, в форме 3 – го лица единственного числа имеют окончание **-ies**:

carry – it carries	<i>нести – он (она, оно) несет</i>
try – she tries	<i>стараться – она старается</i>
deny – he denies	<i>отрицать – он отрицает</i>

Если **-y** стоит после гласной (а, е, і, о, у), то **-y** остается без изменения:

buy – he buys	<i>покупать – он покупает</i>
say – she says	<i>говорить – она говорит</i>
employ – it employs	<i>использовать – он (она, оно) использует</i>

Исключения:

Go – he goes	<i>идти – он идет</i>
Do – it does	<i>делать – он (она, оно) делает</i>
Have – she has	<i>иметь – она имеет</i>
Be – I am, you are, he, she, it is, we, they are	<i>являться – я являюсь, ты являешься (вы являетесь), он (она, оно) является, мы являемся, они являются</i>

8.1.2 Образование –ing форм

Формы, оканчивающиеся на **–ing**, образуются из неопределенной формы глагола без частицы **to + -ing**:

talk *говорить* + -ing = talking

dream *мечтать* + -ing = dreaming

Немая буква –е на конце слова опускается:

pace	<i>шагать</i>	- pacing
ride	<i>ехать верхом</i>	- riding

Согласные (d, m, r и т.д.) после краткого ударного гласного (a, e, i, o, u) удваиваются:

run	<i>бежать</i>	running
grub	<i>копать</i>	grubbing
permit	<i>разрешать</i>	permitting
slam	<i>захлопывать</i>	slamming

Если конечная гласная не стоит под ударением, согласная не удваивается:

enter	<i>входить</i>	entering
profit	<i>получать прибыль</i>	profiting

–ie в конце слова превращается в –ying:

lie	<i>лежать</i>	lying
tie	<i>привязывать</i>	tying

–r в конце слова после ударной гласной удваивается:

prefer	<i>предпочитать</i>	preferring
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–l в конце слова после гласной удваивается:

travel	<i>путешествовать</i>	travelling
libel	<i>клеветать</i>	libelling

–e в конце слова меняется на –ck:

picnic	<i>участвовать в пикнике</i>	picnicking
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Формы настоящего продолженного времени (Present Continuous) образуются следующим образом:

am/ are/ is + -ing-форма

или краткие формы: 'm/ 're/ 's + -ing-форма

I'm coming	я иду
we're eating	мы едим
Jack is crying	Джек кричит
my parents are gardening	мои родители работают в саду

8.1.3 Употребление настоящего простого времени

Настоящее простое время описывает действия, которые происходят повторно, регулярно, по привычке или по традиции:

I eat five pieces of fruit a day.	<i>Я ем ежедневно пять фруктов.</i>
She writes to all her friends.	<i>Она пишет всем своим друзьям.</i>

Простое настоящее время используется также, чтобы описать профессиональные действия, длительные занятия и т.д.:

My brother sings in a rock band.	<i>Мой брат поет в рок – группе.</i>
Laura writes computer programs.	<i>Лаура пишет компьютерные программы.</i>

Настоящее простое время употребляется также для описания абсолютных истин и естественных законов:

Water consists of hydrogen and oxygen.	<i>Вода состоит из водорода и кислорода.</i>
The monsoon seasons starts in April.	<i>Период муссонов начинается в апреле.</i>

8.1.4 Употребление настоящего продолженного времени

Настоящее продолженное время используется для описания процессов или действий, которые происходят в настоящий момент:

He's sleeping.	<i>Он спит.</i>
They're lying in the sun.	<i>Они лежат на солнце (загорают).</i>

Настоящее продолженное время указывает также на незаконченные действия и занятия, которые продолжаются и в более длительный период. если в русском языке можно добавить «в данный момент», это указывает на необходимость употребления настоящего продолженного времени:

Mary's living with her sick father. *Мэри живет со своим больным отцом.*
 The tomatoes are growing really well this year. *В этом году помидоры действительно хорошо растут.*

Настоящее продолженное время используется также, чтобы описать постепенные изменения состояния:

Young Hugo is getting bigger every day. *Молодой Хьюго растет изо дня в день.*

8.1.5 Глаголы, которые обычно не употребляются в настоящем продолженном времени

Некоторые глаголы относительно редко употребляются в настоящем продолженном времени, так как они не описывают процессы как таковые, а скорее обозначают «статические» состояния. К ним относятся следующие глаголы в указанных значениях:

believe	<i>верить</i>	think	<i>думать</i>
hope	<i>надеяться</i>	understand	<i>понимать</i>
feel	<i>чувствовать</i>	know	<i>знать</i>
like	<i>любить</i>	mean	<i>значить</i>
hate	<i>ненавидеть</i>	remember	<i>вспоминать</i>
want	<i>хотеть</i>	forget	<i>забывать</i>
wish	<i>желать</i>	cost	<i>стоить</i>
sound	<i>звучать</i>	contain	<i>содержать</i>
look	<i>выглядеть</i>	belong	<i>принадлежать</i>
seem	<i>казаться</i>	own	<i>владеть</i>
see	<i>видеть</i>	need	<i>нуждаться</i>

It depends. *Это зависит от обстоятельств.*
 She smells lovely. *Она пахнет чудесно.*
 You sound awful. *Вы звучите ужасно.*
 This tastes strange. *Это имеет странный вкус.*

Если такие глаголы употребляются в настоящем продолженном времени, они большей частью имеют другое значение. Действие относится к будущему:

He's seeing the doctor tomorrow. *Завтра он идет к врачу.*

8.1.6 Настоящее продолженное время глаголов to have и to be

Глагол **to have** не употребляется в настоящем продолженном времени, если выражает значение «иметь, владеть».

В других значениях он может употребляться в настоящем продолженном времени:

Jamie has a computer.
We're having our tea.

*У Джемми есть новый компьютер.
Мы пьем чай.*

Глагол **to be** может употребляться в настоящем продолженном времени только в следующих случаях:

- в пассиве (см. 8.5)
- в сочетании с прилагательным, которое выражает определенное состояние

The house is being painted next week. *Дом будут красить на следующей неделе.*

The dogs are being very aggressive at this moment. *В данный момент собаки ведут себя очень агрессивно.*

8.2 Прошедшее время: простое и продолженное

8.2.1 Образование простого прошедшего времени (Past Simple)

Формы прошедшего времени неправильных глаголов представлены в приложении.

- У правильных глаголов к неопределенной форме глагола без частицы to прибавляется – ed:

talk	talked	<i>говорить</i>	<i>говорил</i>
play	played	<i>играть</i>	<i>играл</i>
kick	kicked	<i>лягать</i>	<i>лягнул</i>

- Согласные (b, m, p и т.д.) после кратких гласных (a, e, i, o, u) удваиваются

bug	bugged	<i>подслушивать</i>	<i>подслушивал</i>
pot	potted	<i>консервировать</i>	<i>консервировал</i>
pad	padded	<i>набивать волосом</i>	<i>набивал волосом</i>

- Согласные после ударных гласных в двусложных словах удваиваются:

refer	referred	<i>сослаться</i>	<i>сослался</i>
occur	occurred	<i>происходить</i>	<i>происходил</i>

- Согласные после безударных гласных не меняются:

suffer	suffered	<i>страдать</i>	<i>страдал</i>
target	targeted	<i>планировать</i>	<i>планировал</i>

credit	credited	доверять	доверял
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- Буква **l** удваивается в британском варианте английского языка (в противоположность американскому):

travel	travelled	путешествовать	путешествовал
label	labelled	клеить	клеил

- **-y** после согласных в правильных глаголах превращается в **-ie**:

try	tried	стараться	старался
hurry	hurried	торопиться	торопился
comply	complied	уступить	уступил

- Этого не происходит, если перед **-y** стоит гласная:

play	played	играть	играл
obey	obeyed	повиноваться	повиновался

8.2.2 Употребление простого прошедшего времени

Простое прошедшее время указывает действия, которые неоднократно или регулярно повторялись в прошлом:

He sometimes called me up in the middle of the night. *Иногда он звонил мне посреди ночи.*
 She visited us every summer. *Она посещала нас каждое лето.*

Простое прошедшее время используется также для обозначения отдельных действий, которые закончились в прошлом. Часто в предложении указывается точное время (например, last month в прошлом месяце) или имеется косвенное указание на определенное время (например, during the war во время войны):

We went to Malta in May. *В мае мы ездили на Мальту.*
 He wrote his autobiography during the school holidays. *Он написал свою автобиографию во время школьных каникул.*

Простое прошедшее время используется также, если речь идет о последовательности действий или событий:

He searched all over the house, looked *Он обыскал весь дом, посмотрел под*

under the beds, even emptied the dustbin, *кроватями, опустошил даже мусорное ведро, но не смог найти письмо.*
but couldn't find the letter.

8.2.3 Образование прошедшего продолженного времени

Прошедшее продолженное время **образуется с помощью**

was/ were + -ing форма:

He was mowing the lawn.

Он косил газон.

8.2.4 Употребление прошедшего продолженного времени

Прошедшее продолженное время используется для того, чтобы описать действие, которое происходило в определенный момент в прошлом. В русском языке часто можно добавить слова «как раз», «тогда», «в данный момент»:

- What was she doing on the roof?

- *Что она делала на крыше?*

- She was adjusting the aerial.

- *Она настраивала антенну.*

On Friday afternoon we were playing tennis in the park.

В пятницу днем мы в парке играли в теннис.

Прошедшее продолженное время описывает также развивающиеся процессы в прошлом или еще не законченные действия:

He was getting more and more irritable.

Он становился все более и более раздраженным.

Last year they were training for the Olympics.

В прошлом году они готовились к Олимпийским играм.

Также используют **прошедшее продолженное время** для того, чтобы описать различные действия, которые происходили одновременно:

Last night Ron was watching TV, the children were playing in the garden, Rita was clearing up the kitchen and I was walking the dogs.

Вчера вечером Рон смотрел телевизор, дети играли в саду, Рита убирала на кухне, а я выгуливал собак.

8.2.5 Сравнение прошедшего простого и прошедшего продолженного

Если в одном и том предложении употреблены и **прошедшее простое время**, и **прошедшее продолженное время**, то прошедшее продолженное время выражает действие, которое уже происходило, когда произошло новое действие (в прошедшем простом времени):

He was playing the piano when the police

Он играл на пианино, когда в дверь

knocked at the door.

постучала полиция.

8.3 Простое прошедшее и настоящее перфектное время

8.3.1 Образование настоящего перфектного времени (*Present Perfect*)

Настоящее перфектное время образуется с помощью глагола

have/ has + причастие прошедшего времени (Past Participle):

I have slept

я спала

she has arrived

она приехала

they have gone

они уехали

Форма причастия прошедшего времени правильных глаголов совпадает с формой простого прошедшего времени. Он образуется из неопределенной формы глагола без **to + -(e)d**;

want – wanted

хотеть

visit – visited

посещать

care – cared

заботиться

В настоящем перфектном времени часто встречаются сокращенные формы:

I've, you've, we've, they've, he's, she's, it's

Отрицательная сокращенная форма –

haven't/ hasn't + причастие прошедшего времени

8.3.2 Употребление простого прошедшего времени и настоящего перфектного времени

Простое прошедшее время описывает процессы и действия, которые произошли в прошлом, полностью закончены и не имеют никакого непосредственного отношения к настоящему:

As a racing driver **he crashed** 16 cars.

*Будучи гонщиком, он разбил 16 машин.
(т.е. он больше не является гонщиком)*

Настоящее перфектное время связывает действие с настоящим: оно перебрасывает мостик от прошлого к настоящему. В русском языке часто можно добавить «теперь», «до сих пор» или «до этого момента»:

As a racing driver **he has crashed** 16 cars.

*Будучи гонщиком, он разбил 16 машин
(до этого момента). (т.е. он все еще
является гонщиком и будет, возможно,*

разбивать машины и дальше).

Есть несколько признаков, которые, как правило, указывают на прошедшее простое или настоящее перфектное время:

Прошедшее простое время		Настоящее перфектное время	
yesterday	<i>вчера</i>	up to now	<i>до сих пор</i>
last night	<i>вчера вечером</i>	until/till now	<i>до сих пор</i>
last week	<i>на прошлой неделе</i>	so far	<i>до сих пор</i>
last summer	<i>прошлым летом</i>	yet (в отрицательных предложениях)	<i>еще не</i>
in 1982	<i>в 1982</i>	yet (в вопросах)	<i>уже</i>
in April	<i>в апреле</i>	lately	<i>в последнее время</i>
in the evening	<i>вечером</i>		
at midday	<i>в полдень</i>		
at Easter	<i>на Пасху</i>		
at 3 o'clock	<i>в три часа</i>		
on August 3-rd	<i>3 августа</i>		
on Monday	<i>в понедельник</i>		
a year ago	<i>год назад</i>		
two days ago	<i>два дня назад</i>		
just (then)	<i>как раз (тогда), именно</i>		
when	<i>когда (в вопросах)</i>		
	<i>когда (союз)</i>		

Если в предложениях нет признаков, указывающих на необходимость использования настоящего перфектного времени, следует придерживаться следующих правил:

- Если речь идет о событиях, имевших место в прошлом, в английском языке употребляется **простое прошедшее время**:

The "Titanic" sank in 1912.

«Титаник» затонул в 1912 году.

- При описании процессов, событий и действий, которые происходили совсем недавно, также используют **простое прошедшее время**, если говорящий рассматривает их как законченные в прошлом:

They ordered us to evacuate our houses.

Они приказали нам покинуть наши дома.

She took photos of everyone at the wedding.

Она сфотографировала всех на свадьбе.

- Если при описании процесса, имевшего место в прошлом, важны результаты и влияние, оказанное на настоящее, употребляется **настоящее перфектное время**:

They have ordered us to evacuate our houses. *Они приказали нам покинуть наши дома. (т.е. дома еще не покинуты, приказ сохраняет силу в настоящем)*

She has taken photos of everyone at the wedding. *Она сфотографировала всех на свадьбе. (т.е. фотографии еще не готовы, есть связь с настоящим)*

- Однако, если имеется признак, характерный для **простого прошедшего времени**, нельзя использовать **настоящее перфектное время**:

She took photos of everyone at last Saturday's wedding. *Она сфотографировала всех на свадьбе в прошлую субботу.*

- Если неважно, когда именно в прошлом что-то произошло, употребляется **настоящее перфектное время**. В русском языке часто можно вставить «уже»:

I've seen that film before. *Я уже видел этот фильм раньше.*

Настоящее перфектное время используется также для описания процессов, которые начались в прошлом и не закончились до настоящего момента. Часто процесс все еще продолжается. В таких случаях часто используют **настоящее перфектное продолженное время**:

She's been with this company for five years. *Она работает в этой фирме пять лет.*

I've been sitting in this waiting room for two hours. *Я уже два часа сижу в этом зале ожидания.*

Длительность процесса или действия в английском языке может передаваться двумя разными предложениями:

- for – показывает, сколько времени продолжается действие
- since – показывает, с какого времени продолжается действие

We've only been married for two weeks. *Мы женаты только две недели.*
Our friends have been married since July. *Наши друзья женаты с июля.*

Таблица применения **for** и **since**:

for промежуток времени (*в течение*) **since** указание начала действия (*с ...*)
 Большой частью с указанием точное указание начала действия:
 длительности действия с *a/an* или во
 множественном числе:

for a month	<i>в течение месяца</i>	since midnight	с полуночи
for an hour	<i>в течение часа</i>	since 5 o'clock	<i>с пяти часов</i>
for some time	<i>в течение не- которого времени</i>	since January	<i>с января</i>
for several weeks	<i>в течение не- скольких недель</i>	since we last met	<i>с нашей последней встречи</i>
for years	<i>в течение не- скольких лет</i>	since he left school	<i>с того времени, когда он кончил школу</i>

8.4 Формы будущего времени

8.4.1 Образование будущего времени

Значение будущего времени можно выразить пятью способами:

1. будущим с will (в устной речи также 'll)	She'll tell you. <i>Она расскажет вам.</i>	will, 'll
2. конструкцией be going to	I'm going to look for a new job. <i>Я буду искать новую работу.</i>	am/ are/ is going to + неопределенная форма глагола
3. настоящим продол- женным временем	They're leaving tomorrow. <i>Они уедут завтра.</i>	am/ are/ is + форма, оканчивающаяся на -ing
4. простым настоящим временем	We fly to Goa on Friday. <i>Мы полетим в Гоа в пятницу.</i>	неопределенная форма глагола (без частицы to) после he, she, it (3-е лицо единственного числа)-(e)s
5. будущим продол- женным временем	I'll be seeing him on Monday. <i>Я увижу его в понедельник.</i>	will/ shall + be + -ing форма

Важно также отметить следующее:

- **Will** большей частью сокращается, превращаясь в **'ll**.
- Отрицательная форма **will not** почти всегда сокращается, превращаясь в **won't**.
- 4-й вариант (настоящее простое время со значением будущего) используется не очень часто.

Употребление форм будущего легче понять, если выделить два основных его значения:

- предсказание/предположение (что произойдет?)
- намерение (что именно мы хотим сделать?)

8.4.2 Предсказания/ предположения

Будущее простое время (Future Simple) используется в обобщающих высказываниях:

It'll be all right.

Все будет в порядке.

Форма **going to** используется, если говорящий почти уверен, что действие действительно произойдет. Часто это и в самом деле происходит:

He's going to fall!

Он сейчас упадет!

I'm going to be sick.

Меня сейчас вырвет.

Будущее продолженное время (Future Continuous) употребляется, когда какое-то действие ожидается в любом случае:

They'll be arriving in an hour.

Они приедут через час.

8.4.3 Намерение, план, соглашение

При спонтанных, не продуманных заранее высказываниях используют **будущее простое время**:

I'll make us something to eat.

Я приготовлю нам что-нибудь поесть.

We'll order a taxi to take us to the opera.

Мы закажем такси, чтобы поехать в оперу.

При заранее обдуманных решениях используют **be going to**. Часто при этом выражается решимость действующего лица:

I'm going to throw the TV set out!

Я сейчас выброшу телевизор!

We're going to have a party and invite all our friends.

Мы собираемся устроить вечеринку и пригласить всех наших друзей.

Настоящее продолженное время используется для того, чтобы выразить запланированное действие или соглашение. При этом в предложении часто встречаются указания на время или вопросительное слово, относящееся ко времени (например, *when когда*), чтобы уточнить, что речь идет о будущем, а не о настоящем:

On Sunday I'm helping my grandma in *В воскресенье я буду помогать моей*

the garden, then I'm going out with Sarah. *бабушке в саду, потом я пойду куда-нибудь с Сарой.*

Часто форма **going to** и **настоящее продолженное время** взаимозаменяемы. При употреблении **be going to** и **настоящего продолженного времени** подчеркивается намерение действующего лица и его твердое решение:

When you are going to see your parents? *Когда вы собираетесь навестить своих родителей?*
 When you are seeing your parents? *Когда вы навестите своих родителей?*

При указании срока или времени будущего действия (например, часы работы, время вылета и приземления и т.д.) используется **простое настоящее время**:

The next train to Brighton **leaves** at ten past two. *Следующий поезд в Брайтон отправится в десять минут третьего.*
 The bar **closes** at midnight. *Бар закроют в полночь.*

8.4.4 Будущее перфектное время (Future Perfect)

Будущее перфектное время (**will/'ll have** + причастие прошедшего времени **Past participle**) используется для выражения действия, которое произойдет к определенному моменту в будущем:

By the end of March, I will have written 15 essays. *К концу марта я уже напишу 15 эссе.*

Будущее перфектное продолженное время (Future Perfect Continuous (will/'ll have been + -ing форма)) употребляется для описания действия, которое не закончится к определенному моменту в будущем:

By May 21st, we'll have been living here for twelve years. *К 21 мая мы будем жить здесь уже двенадцать лет.*

8.5 Пассив (Passive Voice)

Пассив (страдательный залог) употребляется для того, чтобы описать действие, не называя действующее лицо. В центре внимания находится лицо или предмет, над которым совершается действие.

8.5.1 Образование пассива

Пассив образуется следующим образом:

**подлежащее + нужная форма + причастие прошедшего времени
глагола to be**

They	were	arrested.
Они	были	арестованы.

She's always invited to the parties.	<i>Ее всегда приглашают на вечеринки.</i>
We were welcomed by the Duke.	<i>Нас приветствовал герцог.</i>
I've never been examined by her.	<i>Меня она никогда не экзаменовала.</i>

Действующее лицо с глаголом в пассиве употребляется с предлогом **by**, стоящим пред ним. В вопросах этот предлог большей частью стоит в конце предложения:

He was reported by a neighbour.	<i>На него указал сосед.</i>
Who were they accompanied by?	<i>Кто их сопровождал?</i>

8.5.2 Сложное подлежащее

Ряд английских глаголов может употребляться в пассиве, образуя сложное подлежащее, оборот, который невозможен в русском языке. Вот некоторые из самых важных глаголов:

advise	советовать	sell	продать
tell	говорить	show	показывать
promise	обещать	send	посылать
order	приказывать	bring	приносить
prescribe	предписывать	lend	одалживать
expect	ожидать	help	помогать
offer	предлагать	give	давать
allow	позволять	teach	учить

I was advised to see a dentist.	<i>Мне посоветовали пойти к зубному врачу.</i>
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Неопределенно – личные конструкции русского языка часто передаются в английском языке пассивом:

He was told there were no tickets left.	<i>Ему сказали, что билетов больше не осталось.</i>
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8.5.3 Продолженное время в пассиве

В пассиве употребляется только настоящее (**подлежащее + am/ are/is being + причастие прошедшего времени**) и прошедшее продолженное время (**подлежащее + was/ were being + причастие прошедшего времени**):

I think we're being watched.	<i>Я думаю, что за нами следят.</i>
He was being questioned by the police.	<i>Его допрашивала полиция.</i>

8.5.4 Особые конструкции в пассиве

Герундий и инфитив также имеют формы пассива: **being + причастие прошедшего времени, (to)be + причастие прошедшего времени** (после вспомогательных глаголов без частицы **to**):

He loves being tickled .	<i>Ему нравится, когда ему угоджают.</i>
You're too heavy to be carried up the stairs.	<i>Вы слишком много весите, чтобы вас можно было нести по лестнице.</i>
The earthquake could be felt fifty miles away.	<i>Землетрясение можно было почувствовать на расстоянии в пятьдесят миль.</i>

Следующие пассивные конструкции часто используются с глаголами *говорить, предполагать, утверждать* и родственные им:

подлежащее + глагол в пассиве + конструкция с инфинитивом с to

She is known to have contacts with the gang.

Известно, что она связана с бандой.

there + глагол в пассиве + конструкция с инфинитивом

There are believed to have been two arrested.

Считают, что было два ареста.

is + глагол в пассиве + конструкция с that

It is feared that 20 people may have died.

Есть опасения, что погибло 20 человек.

В следующем списке приводятся самые важные глаголы, которые часто встречаются в этих конструкциях. Также возможны другие формы (с подлежащим или **there**):

it is said	<i>говорят</i>
it is known	<i>известно</i>
it is thought	<i>считают</i>
it is believed	<i>верят</i>
it is felt	<i>чувствуют</i>
it is supposed	<i>предполагают</i>

it is feared	<i>опасаются</i>
it is claimed	<i>утверждают</i>
it is reported	<i>сообщают</i>
it is understood	<i>понимают</i>
it is recognized	<i>признают</i>
it is acknowledged	<i>признают</i>

8.6 Причастие

8.6.1 Образование различных форм причастия

Имеются разные формы причастия:

	активное	пассивное
Причастие настоящего времени	asking	being asked
Причастие прошедшего времени	_____	asked
Причастие перфектное	having asked	having been asked

Причастия образуются следующим образом:

- **Причастие настоящего времени** в активном залоге – **- ing** форма.
- **Причастие прошедшего времени** в пассивном залоге образуется от стандартных глаголов прибавлением **-(e)d** к инфинитиву глагола без частицы **to**.
- **Причастие перфектное** в активном залоге состоит из **having** + **причастие прошедшего времени**
- **Причастие настоящего времени** в пассивном залоге образуется из **being** + **причастие прошедшего времени**
- **Причастие перфектное** в страдательном залоге состоит из **having been** + **причастие прошедшего времени**

8.6.2 Употребление причастий

Причастие настоящего времени и причастие прошедшего времени часто используются как прилагательные (определения) и употребляются с именами существительными:

the falling rain	<i>падающий дождь</i>
a roasted chicken	<i>жареная курица</i>

В отличие от русского языка не всегда можно поставить причастие перед именем существительным. В таких случаях большей частью используется сложное дополнение:

I heard a **child crying**. (= a child who was crying) *Я слышал, как ребенок плачет.*

Причастие настоящего времени может стоять после следующих глаголов:

catch	<i>ловить</i>	keep	<i>продолжать</i>
find	<i>находить</i>	leave	<i>оставлять</i>

а так же после глаголов восприятия:

see	<i>видеть</i>	notice	<i>замечать</i>
hear	<i>слышать</i>	watch	<i>наблюдать</i>
smell	<i>пахнуть</i>	observe	<i>наблюдать</i>
feel	<i>чувствовать</i>		

Структура предложения выглядит при этом следующим образом:

глагол + **дополнение** + **причастие настоящего времени**
I could hear **you** **snoring** last night.

Я мог слышать, как вы храпели прошлой ночью.

They found **her** **sitting** in the park.

Они нашли ее сидящей в парке.

При описании коротких процессов после **feel** *чувствовать*, **hear** *слышать*, **see** *видеть*, **smell** *пахнуть* и **watch** *наблюдать* можно употреблять также неопределенную форму (без частицы to) вместо причастия настоящего времени::

I saw you run when you father turned up.

Я увидел, что вы побежали, когда внезапно появился ваш отец.

Причастие настоящего времени может стоять, непосредственно после глаголов **come** *приходить* и *доходить*.

They come slithering along the pavement.

Они шли по тротуару, скользя.

The tyre went bouncing down the hill.

Шина катилась с холма, подпрыгивая.

После следующих «статических» глаголов может стоять **причастие настоящего времени** или **причастие прошедшего времени**:

lay	<i>лежать</i>	sit	<i>сидеть</i>
remain	<i>оставаться</i>	stand	<i>стоять</i>

В русском языке им может соответствовать неопределенная форма глагола, деепричастие или личная форма глагола с союзом «и»:

He lay there smoking.	<i>Он лежал, куря (и курил.)</i>
We were asked to remain seated.	<i>Нас попросили продолжать сидеть.</i>

8.6.3 Употребление причастия вместо придаточного предложения

Причастие настоящего времени и причастие прошедшего времени могут использоваться вместо придаточного предложения. Но это возможно только, если обе части предложения имеют одно и то же подлежащее.

В русском языке, помимо деепричастия, часто в таких случаях можно использовать придаточное предложение с союзами «когда», «и», «так как» и т.д.:

Turning the corner, I came face to face with my ex-husband.	<i>Когда я завернула (завернув) за угол, я столкнулась с моим бывшим мужем.</i>
Completely surprised, he sat there without saying a word.	<i>Так как он был очень удивлен, он сидел не произнося ни слова.</i>

Конструкция **having + причастие прошедшего времени** соответствует в русском языке конструкциям с союзами «после того, как», «когда» и другими или деепричастию прошедшего времени.

В пассиве употребляется конструкция **having been + причастие прошедшего времени**:

Having lost her job she emigrated to Canada.	<i>После того, как она осталась без работы, она эмигрировала в Канаду.</i>
Having been abandoned by his parents, he was raised by an aunt.	<i>После того, как его бросили родители, он воспитывался тетей.</i>

8.6.4 Употребление причастия вместо определительного придаточного предложения

Причастие настоящего времени и причастие прошедшего времени используется также вместо определительных придаточных предложений. При этом причастие стоит непосредственно за именем существительным, к которому оно относится, или за наречием:

I asked the policeman (who was) standing on the corner.

Я спросил полицейского, (который стоял) стоявшего на углу.

The statue (that was) found at this spot is now in the museum.

Статуя, (которую нашли) найденная на этом месте, сейчас находится в музее.

8.6.5 being

Being в начале предложения вводит оборот, являющийся обстоятельством причины, и переводится «так как»/ «потому что» или «будучи» и другими деепричастиями:

Being a perfectionist, he won't send that letter out.

Так как он является перфекционистом, он не отправит это письмо.

8.7 Косвенная речь

Косвенная речь состоит из главного предложения (**he said** он сказал, **they told us** они сказали нам и т.д.) и придаточного предложения, передающего то, что первоначально являлось прямой речью (то, что было написано в кавычках). Если в английском языке главное предложение стоит в прошедшем времени, то в придаточном предложении изменяются грамматические времена:

Прямая речь

"I'm tired," said Mary.

«Я устала», - сказала Мэри.

настоящее простое время

"He's doing his homework," said Mrs. Brown.

«Он делает свою домашнюю работу», - сказала миссис Браун.

настоящее продолженное время

"I met him on the bus," said Jeffrey.

«Я встретил его в автобусе», - сказал Джеффри.

прошедшее простое время

"They were swimming when it happened," said Mr. Parr.

«Они плавали, когда это произошло», сказал господин Парр.

Косвенная речь

Mary said (that) she was tired.

Мэри сказала, что она устала.

прошедшее простое время

Mrs. Brown said (that) he was doing his homework.

Миссис Браун сказала, что он делает свою домашнюю работу.

прошедшее продолженное время

Jeffrey said (that) he had met him on the bus.

Джеффри сказал, что встретил его в автобусе.

Прошедшее перфектное время (had + причастие прошедшего времени)

Mr. Parr said (that) they had been swimming when it (had) happened.

Господин Парр сказал, что они плавали, когда это произошло.

прошедшее продолженное перфектное

прошедшее продолженное время

“Mike’s just gone shopping,” said Frank.

*«Майк только, что ушел за покупками»,
сказал Франк.*

настоящее перфектное время

“We’ve been running in the gym,” the boys told him.

«Мы бегали в спортзале», - сказали ему мальчики.

настоящее продолженное перфектное время

“We had never eaten horse meat before,” they admitted.

«Мы никогда раньше не ели конину», - признались они.

прошедшее перфектное время

“I had been hoping you would be here,” he said.

«Я надеялась, вы будете здесь», - сказала она.

прошедшее продолженное перфектное время

“We’ll be in touch,” said the Millers.

«Мы будем поддерживать контакт», - сказали Миллеры.

будущее простое время

“I’ll be visiting China,” said Dr. Chen.

«Я буду с визитом в Китае», - сказал д-р Чен.

будущее продолженное время

“They’ll have gone finishing,” said Clare.

«Они уже уйдут ловить рыбу», сказала Клер.

будущее перфектное время

“Gran will have been resting with her friends,” said mum.

«Бабушка будет отдыхать со своими друзьями», - сказала мама.

время (had been+ -ing форма)

Frank said that Mike had just gone shopping.

Франк сказал, что Майк только что ушел за покупками.

прошедшее перфектное время

The boys told him (that) they had been running in the gym.

Мальчики сказали ему, что они бегали в спортзале.

прошедшее продолженное перфектное время

They admitted (that) they had never eaten horse meat before.

Они признались, что никогда раньше не ели конину.

прошедшее перфектное время

She said (that) she had been hoping he would be there.

Она сказала, что надеялась, что он будет здесь.

прошедшее продолженное перфектное время

The Millers said (that) they would be in touch.

Миллеры сказали, что будут поддерживать контакт.

будущее в прошедшем – Future in the Past (would + инфинитив без частицы to)

Dr. Chen said (that) he would be visiting China.

Д-р Чен сказал, что посетит Китай.

(would be + -ing форма)

Clare said (that) she would have gone finishing.

Клер сказала, что они уже уйдут ловить рыбу.

(would have + причастие прошедшего времени + -ing форма)

Mum said (that) Gran would have been resting with her friends.

Мама сказала, что бабушка будет отдыхать со своими друзьями.

будущее продолженное перфектное время**будущее перфектное продолженное время в прошедшем**

- Косвенная речь может употребляться после глаголов **say** *сказать*, **tell** *сказать*, **admit** *признавать* и **think** *думать* с **that** или без него, но в любом случае без запятой.
- После глагола **tell** *сказать*—всегда должно стоять косвенное дополнение (например, **me**, **us**, **them**).
- Напротив, после глаголов **answer** *отвечать*, **reply** *отвечать*, **explain** *объяснять*, **remark** *замечать*, **add** *добавлять* и **state** *заявлять* почти всегда стоит **that** (также без запятой).

При употреблении модальных глаголов в косвенной речи необходимы следующие изменения времени, если главное предложение стоит в прошедшем времени:

Прямая речь

can

may (возможность)

will/ shall

shall (в вопросах)

Косвенная речь

could

might

would

should

Следующие формы вспомогательных глаголов остаются в косвенной речи неизменными: **could**, **had better**, **might**, **needn't**, **ought to**, **should**, **used to**, **would**.

Must в косвенной речи заменяется на **had to**, за исключением тех случаев, когда речь идет о чем-нибудь необходимом в будущем. В этом случае глагол **must** или совсем не заменяется, или заменяется на **would have to**:

“I must show what I bought,” said Philip.

«Я должен показать вам, что я купил», - сказал Филипп.

“We must have a chat,” said Sue.

«Мы должны поговорить», - сказала Сью.

Phillip said (that) he had to show me what he had bought.

Филипп сказал, что должен показать мне, что он купил.

Sue said (that) we must/ would have to have a chat.

Сью сказала, что мы должны поговорить.

Needn't остается без изменения в косвенной речи или заменяется на **didn't need to** или **didn't have to**:

“You needn't come,” said Peter.

«Вам необязательно приходить», - сказал Питер.

Peter said (that) I needn't/ I didn't need to/ I didn't have to come.

Питер сказал, что мне необязательно приходить.

Used to остается в косвенной речи либо без изменений, либо заменяется на **had previously been**:

<p>“Dan used to be a karate expert,” Simon told me. <i>«Дэн был экспертом по карате», сказал Симон.</i></p>	<p>Simon told me (that) Dan used to be/ had previously been a karate expert. <i>Симон сказал, что Дэн был экспертом по карате.</i></p>
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8.7.1 Исключения из правил

При высказывании абсолютной истины изменение времени в косвенной речи не обязательно:

<p>“It gets very cold in winter,” said Martha. <i>«Зимой очень холодно», - сказала Марта.</i></p>	<p>Martha said (that) it gets very cold in winter. <i>Марта сказала, что зимой очень холодно.</i></p>
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Если сказуемое в прямой речи стоит в настоящем времени, это время в косвенной речи не изменяется, если подчеркивается, что действие происходит в настоящее время или если следует избежать недоразумения:

<p>“I live in Cambridge,” he said. “Pardon?” “I said I live in Cambridge.”</p>	<p><i>«Я живу в Кембридже», - сказал он.</i> <i>«Что вы сказали?»</i> <i>«Я сказал, что живу в Кембридже».</i></p>
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8.7.2 Косвенные вопросы

В косвенных вопросах с вопросительным словом порядок слов такой же, как в обычных повествовательных предложениях и косвенной речи. Последовательность времен такая же:

<p>“How will you pay for it?” she asked us. <i>«Как вы заплатите за это?», - она спросила нас.</i></p>	<p>She asked us how we would pay for it. <i>Она спросила, как мы заплатим за это.</i></p>
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Если нет никакого вопросительного слова (**why** почему, **what** что, **какой**, **how** как и т.д.), в косвенных вопросах вставляются слова **if** или **whether** («ли»):

<p>“Does he study well?” Mother asked me.</p>	<p>Mother asked me if/ whether he studies well (drank) wine.</p>
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Мама спросила меня, хорошо ли он учится.

«Он учится хорошо?», - мама спросила меня.

8.7.3 Приказы/ просьбы

Просьба и приказы выражаются в косвенной речи как указано ниже:

подлежащее	глагол	дополнение	инфинитив с частицей to
Samantha	asked	us	to come in.
<i>Саманта</i>	<i>попросила</i>	<i>нас</i>	<i>войти.</i>
The doctor	told	me	to go to bed.
<i>Доктор</i>	<i>велел</i>	<i>мне</i>	<i>лечь в постель.</i>
Roger	begged	them	to leave him alone.
<i>Роджер</i>	<i>попросил</i>	<i>их</i>	<i>оставить его в покое.</i>

8.7.4 Изменения обозначения времени и места

В косвенной речи наречия места и времени заменяются по смыслу другими. Ниже дается список наиболее часто встречающихся замен:

today	сегодня	yesterday	вчера
tomorrow	завтра	(the) next day, the following day	на следующий день
yesterday	вчера	the day before, the previous day	накануне
tonight	сегодня вечером	last night	вчера вечером
this morning	в это утро	that morning	в то утро
here	здесь	there	там
this/ these	это, этот/ эти	that/ those	то, тот/ те
now	сейчас	then	тогда
next week	на следующей неделе	the next week, the following week	на следующей неделе
last week	на прошлой неделе	the previous week	за неделю до
last year	в прошлом году	the year before	за год до

8.8 Условные предложения

В английском языке имеются три типа условных предложений:

Тип 1*

If you work hard	you will pass the exam well.
<i>Если вы усердно работаете,</i>	<i>вы хорошо сдадите экзамен.</i>
условное предложение	главное предложение
настоящее простое	будущее простое

Тип 2

If she studied well	she would know much more.
<i>Если бы хорошо училась,</i>	<i>она знала бы больше.</i>
условное предложение	главное предложение
прошедшее простое	would + инфинитив без частицы to

Тип 3

If they had worked hard	they would not have failed the exam.
<i>Если бы они усердно работали,</i>	<i>они бы не провалили экзамен.</i>
условное предложение	главное предложение
прошедшее перфектное	would have + причастие прошедшего времени
(had + причастие прошедшего времени)	

*Условные предложения первого типа выражают вполне реальные, осуществимые предположения, они относятся обычно к будущему времени и соответствуют в русском языке условным предложениям с глаголом в изъявительном наклонении.

Условные предложения второго типа выражают невероятные или маловероятные предположения. Они относятся к настоящему или будущему времени и соответствуют в русском языке условным предложениям с глаголом в сослагательном наклонении (глагол в форме прошедшего времени с частицей «бы»).

Условные предложения третьего типа выражают предположения, относящиеся к прошедшему времени и являющиеся, поэтому невыполнимыми. Они соответствуют в русском языке, как и английские условные предложения второго типа, условным предложениям с глаголом в сослагательном наклонении, т.е. в русском языке форма глагола не отличается от формы глагола в условных предложениях второго типа.

Условное предложение в английском языке, как и в русском, может стоять как в начале сложного предложения, так и в его конце:

He will break it if you give it to him.

Он сломает это, если вы дадите ему это.

8.8.1 *I would в условном предложении*

В условных придаточных предложениях почти никогда не встречаются **will** и **would**:

It would help if you left me alone.

Было бы хорошо, если бы вы оставили меня в покое.

Исключением является конструкция **if only** *если бы только*, которая стоит в начале пожелания («если бы только») и за которой следует **would**. Однако это обычно не относится к «статическим» глаголам:

If only you would listen to me.

Если бы вы только слушали меня.

Would также используют в условных предложениях, если они представляют собой вежливую просьбу, однако за исключением «статических» глаголов:

We would appreciate it if you would enclose your check.

Мы были бы благодарны вам, если бы вы вложили чек.

8.8.2 *Общие сведения*

Короткие условные придаточные предложения, стоящие в начале сложного предложения, т.е. перед главным предложением, большей частью не отделяются запятой от главного предложения.

Если же условное предложение, стоящее в начале сложного предложения, более длинное, оно обычно отделяется от главного предложения запятой:

If you're ready we can go.

Если вы готовы, мы можем идти.

8.9 Модальные глаголы

Модальные глаголы имеют следующие признаки:

- В 3-м лице единственного числа простого настоящего времени к глаголу не прибавляется **-s**.
- В вопросительных и отрицательных формах эти глаголы не требуют вспомогательного глагола. В отрицательных предложениях очень часто употребляются следующие краткие формы:

can't вместо **cannot**

couldn't вместо **could not**

shouldn't вместо **should not**

mustn't вместо **must not**

- После них стоит инфинитив смыслового глагола без частицы to:

He can write well.

Он умеет (может) хорошо писать.

- Модальные глаголы не могут употребляться в большинстве грамматических времен. Вместо них приходится применять их эквиваленты, т.е. другие глаголы с близким значением, например, **be able to** *быть в состоянии*, **be allowed to** *иметь разрешение*, **have to** *быть вынужденным* и т.д.
- После **could**, **must**, **may** и **might** для выражения прошедшего времени употребляется перфектный инфинитив без частицы to:

She should have gone to the doctor.

Ей следовало пойти к врачу.

- Модальные глаголы могут употребляться без инфинитива только во второй части разделительных вопросов и в кратких ответах:

- You can cook, can't you?

- *Вы умеете готовить, не так ли?*

- No, I can't.

- *Нет (я не умею).*

8.9.1 *can, could, may, might* – способность, умение, возможность, вероятность

«Мочь» в значении «быть способным сделать что-то», «уметь» передается в английском языке следующим образом:

- в настоящем времени **can** или в прошедшем **could**.
- во всех других временах соответствующей формой **be able to**

He could swim when he was two.

Он умел (мог) плавать в два года.

Would you be able to help me?

Вы могли бы помочь мне?

Глаголу «мочь» в значении «сметь», «иметь право», «иметь разрешение» в английском языке соответствует **can**:

Can we have some chocolate?

Можно взять шоколада?

- если «мочь» означает возможность или вероятность, в настоящем времени используются глаголы **might** или **may**. Формой прошедшего времени является **might have** или **may have**.

- в русском языке английские слова **might** или **may** часто переводятся «может быть», «возможно», «вероятно»:

We **might** come on Sunday.

Мы, может быть, приедем в воскресенье.

They **may** be on holiday.

Возможно, они в отпуске.

8.9.2 **can, may, cannot, shouldn't, mustn't** – разрешение, запрет

- Для передачи значения разрешения в отдельных случаях русский глагол «мочь» переводится на английский язык глаголом **can**, а в очень вежливых просьбах – глаголом **may**.
- Для передачи значения запрета в отдельных случаях русское выражение «нельзя» переводится на английский язык как **can't**.
- Для передачи значения разрешения/ запрета обычно в английском языке в настоящем времени и в косвенной речи используют **(not) be allowed to**. Эта же конструкция используется также в тех грамматических временах, в которых употребление **can/ may** невозможно:

Can/ May I come too?

Могу ли я (можно мне) тоже прийти?

No, you **can't** borrow my car.

Нет, вы не можете взять (одолжить) мою машину.

I'm not allowed to eat nuts.

Мне нельзя (запрещено) есть орехи.

- Если «нельзя» выражает совет или требование, в настоящем времени употребляется **shouldn't** или – для большей выразительности **mustn't**.
- В прошедшем времени («не следовало бы») используется **shouldn't** + **перфектный инфинитив**:

You **mustn't** be late!

Вы не должны опаздывать!

We **shouldn't** have told him.

Нам не следовало говорить ему.

8.9.3 **must, have to, should** – долженствование, необходимость, вероятность

Если «должен» выражает уверенное предположение, высокую вероятность или убеждение, в настоящем времени употребляется **must**, а в прошедшем времени **must** + **перфектный инфинитив**. Часто на русском языке говорят в таких случаях «наверное», «определенно» или «вероятно»:

It **must** be here somewhere – I had it in my hand just now.

Это должно быть где-то здесь, я только что держал это в руке.

They **must have** forgotten it.

Они, должно быть (наверное), забыли это.

- Для передачи значения обязанности и необходимости в отдельных случаях в английском языке в настоящем времени используют **must**, особенно если сам говорящий считает что-то необходимым.
- Для передачи значения обычных или постоянных, часто неприятных обязанностей в английском языке возможно только **have (got) to**.
- В других грамматических временах используется соответствующая временная форма **have to**:

I **must** do some weeding in my house.

Я обязательно должен ваполоть сорняки в саду.

You **don't have to** ring me up every day.

Вы не должны звонить мне каждый день.

He **had to** hand in this driving licence.

Он должен был предъявить водительское удостоверение.

Обычно русским оборотам «не нужно», «не надо» соответствует в английском **not have to**, если сам говорящий считает что – то необязательным, можно использовать также **needn't**:

They **don't have to/ needn't** bring any food.

Им необязательно приносить с собой еду.

I **don't have to** go to work today.

Сегодня мне не нужно идти на работу.

Формами прошедшего времени для **not have to** и **needn't** являются **didn't have to** и **didn't need to**. Однако **need** является в этом случае не модальным глаголом. Это означает, что действие в прошлом было необязательным, и не указывается, было ли оно выполнено:

She **didn't have to** pay for the children.

Ей не надо было платить за детей.

I **didn't need to** show my passport.

Мне не нужно было предъявлять мой паспорт.

Needn't have + причастие прошедшего времени означает, что уже выполненное действие было необязательным:

He **needn't have prepared** dinner.

Ему необязательно было готовить ужин.

Сослагательное наклонение «должен был бы», «следовало бы» выражается в английском языке с помощью **should** (настоящее время) и **should have** (прошедшее):

He **should** know – he wrote the book!

Он должен был бы знать – он написал эту книгу!

They **shouldn't have been** more careful.

Они должны были бы быть осторожнее.

8.9.4 *should, ought to, to be to* – *долженствование, моральный долг*

Если «должен» означает вежливое или настойчивое требование, предложение или призыв к совести, говорят **should** или **ought to** в настоящем времени и соответственно **should/ought to have** для обозначения действия в прошлом:

We should/ ought to write a thank–you letter.	<i>Мы должны написать письмо с выражением благодарности.</i>
I should have said something.	<i>Я должен был бы сказать что–нибудь.</i>

Для передачи слухов или неподтвержденного заявления используется соответствующая форма **be said to** или **supposed to**:

Jim’s supposed to have given us his job.	<i>Полагают, что Джим ушел с работы.</i>
More than a thousand people are said to be homeless.	<i>Говорят, что более тысячи людей не имеют крова.</i>

Если «должен» выражает соглашение, задание, что–то предусмотренное, запланированное и т.п., говорят **be supposed to** или **be to**:

You’re supposed to/ You’re to be home by six. *Вы должны быть дома до шести.*

Если «должен был» выражает что–то, еще не произошедшее в данный момент, говорят **was to/ were to**. Описываемое событие произошло позже:

Two years later, they **were to be** divorced. *Через два года они должны были развестись.*

8.10 Герундий и инфинитив

8.10.1 *Образование герундия*

Герундий образуется добавлением **–ing** к инфинитиву без частицы **to**: **running, sleeping, shopping**.

Существуют активные и пассивные формы герундия:

Активная форма настоящего времени:	finding
Пассивная форма прошедшего времени:	being found (being + причастие прошедшего времени)
Активная перфектная форма:	having found (having + причастие прошедшего времени)

Пассивная перфектная форма:

having been found (having been + причастие прошедшего времени)

8.10.2 Употребление герундия

Герундий – глагольная форма, обладающая свойствами как глагола, так и существительного.

Swimming will get you fit.

Плавание будет полезно для вашего здоровья.

I can't stand her boasting.

Я не выношу ее хвастовства.

8.10.3 Герундий после глагола

Герундий употребляется после некоторых глаголов вместо инфинитива. Ниже дается список наиболее важных из таких глаголов:

enjoy doing something	<i>получать удовольствие, делая что-то</i>
feel like doing something	<i>желать сделать что-то</i>
fancy doing something	<i>желать сделать что-то</i>
dislike doing something	<i>не хотеть сделать что-то</i>
mind doing something	<i>возражать против какого-то действия</i>
miss doing something	<i>не сделать чего – либо</i>
suggest doing something	<i>предложить сделать что – то</i>
practise doing something	<i>иметь обыкновение делать что – то</i>
risk doing something	<i>рисковать сделать что – то</i>
admit doing something	<i>признать, что сделали что – то</i>
deny doing something	<i>отрицать, что сделали что – то</i>
consider doing something	<i>обдумывать сделать что – то</i>
think of doing something	<i>обдумывать сделать что – то</i>
carry on doing something	<i>продолжать делать что – то</i>
keep (on) doing something	<i>продолжать делать что – то</i>
finish doing something	<i>кончить делать что – то</i>
delay doing something	<i>отложить сделать что – то</i>
postpone doing something	<i>отложить сделать что – то</i>
avoid doing something	<i>избегать сделать что – то</i>
prevent somebody from doing something	<i>помешать кому-нибудь сделать что-то</i>
imagine doing something	<i>представить себе действие</i>
appreciate somebody doing something	<i>оценить чей – то поступок</i>

it involves doing something	<i>это требует сделать что – то</i>
it means doing something	<i>это значит, что надо сделать что – то</i>
excuse somebody doing something	<i>извинить кого –нибудь за что – то</i>
I can't help doing something	<i>я не могу не сделать чего – то</i>
something needs doing	<i>надо сделать что – то</i>

8.10.4 Герундий используется после следующих глаголов:

before	<i>прежде чем; перед</i>	instead of	<i>вместо</i>
after	<i>после</i>	in spite of/ despite	<i>несмотря на, хотя</i>
by	<i>благодаря</i>	on	<i>после</i>
besides	<i>помимо того, что; кроме</i>	without	<i>без</i>

He had a shower before jumping into the pool.	<i>Он принял душ, прежде чем прыгнул в бассейн.</i>
Despite breaking both legs, she took up skiing again.	<i>Хотя она сломала себе обе ноги, она снова стала кататься на лыжах.</i>

8.10.5 Герундий употребляется и после следующих словосочетаний:

существительное + предлог

in the hope of doing something	<i>в надежде на то, что будет что–то сделано</i>
be in danger of doing something	<i>быть а опасности от того, что что–то будет сделано</i>
have difficulty in doing something	<i>испытывать трудности, делая что–то</i>
run the risk of doing something	<i>рисковать, делая что–то</i>

прилагательное + предлог

be good/ bad at doing something	<i>хорошо/ плохо делать что–то</i>
be (in) capable of doing something	<i>быть в состоянии сделать что–то</i>
be interested in doing something	<i>быть заинтересованным сделать что–то</i>
be tired of doing something	<i>устать от того, что делали что–то</i>

глагол + предлог

live in fear of doing something	<i>жить, боясь что–то сделать</i>
believe in doing something	<i>верить в то, что надо сделать что – то</i>
think of doing something	<i>думать о том, чтобы сделать что–то</i>
dream of doing something	<i>мечтать о том, чтобы сделать что–то</i>

succeed in doing something	<i>суметь сделать что-то</i>
insist on doing something	<i>настаивать на том, чтобы сделать что-то</i>
talk about doing something	<i>говорить о том, чтобы сделать что-то</i>
worry about doing something	<i>беспокоиться о том, чтобы сделать что-то</i>

8.10.6 Герундий после предлога to

Инфинитив не употребляется после некоторых словосочетаний с to, вместо него употребляется герундий. К этим словосочетаниям относятся следующие:

be used to doing something	<i>обычно делать что-то</i>
be accustomed to doing something	<i>привыкнуть делать что-то</i>
get used to doing something	<i>привыкнуть делать что-то</i>
get accustomed to doing something	<i>привыкнуть делать что-то</i>
look forward to doing something	<i>с нетерпением хотеть сделать что-то</i>
object to doing something	<i>возражать против того, чтобы сделать что-то</i>

8.10.7 used to

used to + инфинитив = ранее, бывало

I used to work every day. *Раньше я работал каждый день.*

Этот оборот употребляется только в прошедшем времени.

Он относится к повторным и привычным действиям или состояниям, продолжающимся длительное время.

Отрицательная форма может образовываться двумя способами:

I didn't use(d) to work. или *Раньше я не работал.*
I never used to work.

Это словосочетание не следует путать с описанным выше:

be used to + герундий = привыкнуть, иметь обыкновение

get used to + герундий = привыкнуть

We were used to eating fish.

Мы привыкли есть (часто, бывало ели) рыбу.

I'll get used to living on my own.

Я привыкну жить самостоятельно.

Эта конструкция может употребляться в любом времени.

8.10.8 Глаголы, употребляющиеся с герундием и инфинитивом

Имеется целый ряд глаголов, которые употребляются как с инфинитивом, так и с герундием и в зависимости от этого имеют совершенно разные значения. К важнейшим из этих глаголов относятся:

Герундий

go on doing something

продолжать делать что-то

remember doing something

вспомнить, что сделали что-то

never forget doing something

не забыть, что сделали что-то

stop doing something

перестать делать что-то

try doing something

попробовать сделать что-то

Инфинитив

go on to do something

перейти к чему-то новому

remember to do something

не забыть сделать что-то

forget to do something

забыть сделать что-то

stop to do something

остановиться, чтобы сделать что-то

try to do something

попытаться и сделать что-то

8.10.9 Герундий в устойчивых словосочетаниях

it's no use/ good doing

нет никакого смысла делать что-то

it's (good) fun doing

забавно сделать что-то

it's bad enough doing

достаточно плохо делать что-то

I (и т.д.) can't help doing

я (и т.д.) не могу не делать чего-то

I (и т.д.) can't stand doing

я (и т.д.) не терплю (люблю) делать что-то

I (и т.д.) don't mind doing

я (и т.д.) не возражаю сделать что-то

be busy doing

быть занятым, делая что-то

it's worth (while) doing

стоит сделать что-то

spend one's time doing

тратить свое время, делая что-то

thanks/ thank you for doing

спасибо за то, что вы сделали что-то

9. ОТНОСИТЕЛЬНЫЕ, НЕОПРЕДЕЛЕННЫЕ И ВОПРОСИТЕЛЬНЫЕ МЕСТОИМЕНЕНИЯ

9.1 Относительные местоимения

9.1.1 Формы относительных местоимений

Как видно из ниже приведенной таблицы, относительные местоимения могут относиться как к одушевленным существительным (людям), так и неодушевленным (предметам):

к людям		к предметам	
who, that	<i>который</i>	that, which	<i>который</i>
who, whom, that	<i>которому и т.д.</i>	that, which	<i>которому и т.д.</i>
whose	<i>которого, чьего</i>	whose	<i>которого, чьего</i>

9.1.2 Употребление относительных местоимений

- Если речь идет о существительном или местоимении в именительном падеже (в русском языке), т.е. о подлежащем (вопросы «кто?», «что?»), то в английском языке им соответствуют в отношении людей **who** или **that**, а предметов – **that** или **which**.
- Если речь идет о животных, употребляют **that** или **which**, в случае эмфатического применения – также **who**.

The man who/ that rang up was my father.	<i>Мужчина, который звонил, был мой отец.</i>
The computer that/ which you ordered, has arrived.	<i>Компьютер, который вы заказали, прибыл.</i>

- Если речь идет о существительном или местоимении в винительном падеже (в русском языке), т.е. о дополнении (вопросы «кого?», «что?»), то в отношении людей употребляются **who** или **that** (реже **whom**), а предметов – **that** или **which**:

The teacher that/ who/ whom you don't like is my wife.	<i>Преподавательница, которую вы не любите, моя жена.</i>
The perfume that/ which you're wearing is very strong.	<i>Духи, которыми вы пользуетесь, пахнут очень сильно.</i>

- Если речь идет о существительном или местоимении в родительном падеже (в русском языке) (вопросы «какого?», «чей?»), то в отношении людей и предметов употребляется **whose**.

The building whose roof collapsed has been	<i>Здание, крыша которого (чья крыша)</i>
--	---

demolished.

обвалилась, было снесено.

- Вместо русского дательного падежа (вопросы «кому?», «чему?») используется относительное местоимение с предлогом (to, for, with и т.д.). Этот предлог ставится большей частью после глагола или причастия.
- Итак, относительные местоимения, относящиеся к людям, это **that/ who** (иногда whom), к предметам – **that/ which**.
- Если перед относительными местоимениями стоит предлог, то употребляется не **that**, а вместо него в отношении людей **whom (for/ with/ by whom** и т.д.), а в отношении предметов – **which (under/ on/ through which** и т.д.)

9.1.3 Опускаемые (описательные) и неопускаемые (индивидуализирующие и классифицирующие) определительные придаточные предложения

Опускаемые определительные придаточные предложения выделяются с обеих сторон запятыми и могут быть опущены без ущерба для смысла главного предложения:

His brother, who is a millionaire, works for Microsoft.

Его брат, который является миллионером, работает на фирме Microsoft.

Без опускаемого определительного придаточного предложения (стоящего между двумя запятыми) предложение будет звучать так:

His brother works for Microsoft.

Его брат работает на фирме Microsoft.

Главное предложение сохраняет свой смысл. То, что сообщается в придаточном предложении, является дополнительной информацией, которую можно опустить.

Неопускаемые определительные придаточные предложения не выделяются запятыми и совершенно необходимы для правильного понимания смысла всего предложения. Их нельзя опустить, иначе исказится смысл всего высказывания:

Babies who scream get on my nerves.

Младенцы, которые пронзительно кричат, действуют мне на нервы.

Если в данном случае опустить определительное придаточное предложение, останется следующее высказывание:

Babies get on my nerves.

Младенцы действуют мне на нервы.

Такое предложение, конечно, совсем не соответствует тому, что хотел сказать говорящий.

При неопускаемых определительных придаточных предложениях можно опустить относительные местоимения **that**, **who** или **which**, если они служат дополнением в придаточном предложении:

The shop (that/ which) I'm talking about is in a side road.

Магазин, о котором я говорю, находится на боковой улице.

The girl (that/ who) you just saw is an actress.

Девушка, которую вы только что видели, актриса.

9.1.4 Русское «(то) что» и т.д. в определительных придаточных предложениях с относительными местоимениями

Русское «что» как обобщение всей предшествующей части предложения передается на английском языке с помощью **which**:

He snores in his sleep, which always wakes me up.

Он храпит во сне, что всегда будит меня.

«То, что» или «что» передается относительным местоимением **what** (а не **that what**):

I don't know what you mean.

Я не знаю, что вы имеете в виду.

It's what you asked for.

Это то, что вы просили.

Русским «все, что», «что-то, что» и т.д. соответствует английское местоимение **that**. Однако оно часто опускается:

There's something (that) you ought to know.

Есть кое – что, что вы должны знать.

Is this all (that) you bought?

Это все, что вы купили?

There's nothing (that) he can eat at the moment.

Нет ничего, что он может съесть сейчас.

9.2 Неопределенные местоимения (some, any, much, many и т.д.)

9.2.1 some/ any

Some используется главным образом:

- в утвердительных высказываниях
- в вопросах, на которые ожидается утвердительный ответ
- в вежливых просьбах или вопросах
- в значении «какой (-ая, -ое) –нибудь» и т.д.

He's got some relatives staying.

У него гостит несколько родственников.

Have you got some time?

Есть ли у вас немного времени?

Take some strawberries with you.

Возьмите с собой (немного) земляники

There must be some reason for it.

Для этого должна быть какая-нибудь причина.

Any используется главным образом:

- в отрицательных предложениях, а также с такими словами, как **never** *никогда*, **hardly** *вряд ли*, **rarely** *редко*, **without** *без* и т.д.
- в вопросах, если спрашивающий не уверен в ответе или ожидает отрицательного ответа
- в значении «каждый (-ая, -ое), любой», «какой (-ая, -ое)–нибудь», «какой–либо»:

There's little chance of getting tickets.

Шансов достать билеты немного.

9.3 Вопросительные местоимения

9.3.1 Перечень вопросительных местоимений

how...?	как...?	who...?	кто...?
what...?	что...?	who(m)...?	кому/ кого...?
when...?	когда...?	whose...?	чей...?
where...?	где...?	why...?	почему...?
which...?	который(-ая, -ое)?		

9.3.2 *who/ whom*

Вопрос с **who** является самой употребительной формой вопроса к дополнению в разговорном английском языке и используется, когда речь идет как о прямом («кого?»), так и о косвенном дополнении («кому?»).

Менее употребительная форма **whom** используется в следующих случаях:

- в официальной речи
- если перед вопросительным словом стоит предлог (to, with, for и т.д.):

Who did you see?

Кого вы видели?

Who does he send them to?

К кому он их посылает?

Whom shall I address?

К кому я должен обратиться?

9.3.3 what/ which + имя существительное

- **What+** имя существительное употребляется в начале вопросов с обобщающим смыслом.
- С **which** + имя существительное начинается вопрос о человеке/ предмете, одном из определенной группы, ряда и т.д. в определенной ситуации:

What bus do you take?

На каком автобусе вы едите?

Which bus was he in?

В каком автобусе он был?

10. ИМЯ ЧИСЛИТЕЛЬНОЕ

10.1 Количественное числительное

1	one	30	thirty
2	two	40	forty
3	three	50	fifty
4	four	60	sixty
5	five	70	seventy
6	six	80	eighty
7	seven	90	ninety
8	eight	100	a/ one hundred
9	nine	101	a/ one hundred and one
10	ten	143	a/ one hundred and forty-three
11	eleven	200	two hundred
12	twelve	1.000	a/ one thousand
13	thirteen	1.310	one thousand three hundred and ten
14	fourteen	2.000	two thousand
15	fifteen	100.000	a/ one hundred thousand
16	sixteen	1.000.000	a/ one million
17	seventeen	1.000.000.000	a/ one billion
18	eighteen		
19	nineteen		
20	twenty		
21	twenty-one		
22	twenty-two		
23	twenty-three		
	twenty-four и т.д.		

Ноль выражается как указано ниже:

- при счете: nought [nɒt], zero [ˈzɪərə];
- при указании очков в спорте: nil, zero; в теннисе: love
- в телефонных номерах: 0 [tʃu], амер. Zero

10.2 Использование точки и запятой

При обозначении чисел свыше 1.000 каждые три цифры справа отделяются в английском языке запятыми, в то время как в русском языке ставятся точки:

5,643

10,235,459

В десятичных дробях в английском языке целое число всегда отделяется от дроби точкой, в то время как в русском языке ставится запятая:

8.4 (eight point four = восемь целых четыре десятых)

0.71 (nought point seven one = ноль целых семьдесят одна сотая)

10.3 Порядковые числительные

1 st	first	21 st	twenty– first
2 nd	second	22 nd	twenty– second
3 rd	third	23 rd	twenty– third
4 th	fourth	24 th	twenty– fourth
5 th	fifth	30 th	thirtieth
6 th	sixth	40 th	fortieth
7 th	seventh	50 th	fiftieth
8 th	eighth	60 th	sixtieth
9 th	ninth	70 th	seventieth
10 th	tenth	80 th	eightieth
11 th	eleventh	90 th	ninetieth
12 th	twelfth	100 th	(one) hundredth
13 th	thirteenth	101 st	(one) hundred and first
14 th	fourteenth	102 nd	(one) hundred and second
15 th	fifteenth	157 th	(one) hundred and fifty–seventh
16 th	sixteenth	200 th	two hundredth
17 th	seventeenth	1.000 th	(one) thousandth
18 th	eighteenth	2.461 st	two thousand four hundred and sixty–first
19 th	nineteenth	1.000.000th	(one) millionth
20 th	twentieth		

НЕПРАВИЛЬНЫЕ ГЛАГОЛЫ

Инфинитив	Простое прошедшее время	Причастие прошедшего времени	Перевод
be	was/ were	been	быть
beat	beat	beaten	бить
become	became	become	становиться
begin	began	begun	начинать
bite	bit	bitten	кусать
blow	blew	blown	дуть
break	broke	broken	ломать
bring	brought	brought	приносить
build	built	built	строить
burst	burst	burst	взрывать
buy	bought	bought	покупать
catch	caught	caught	ловить
choose	chose	chosen	выбирать
come	came	come	приходить
cost	cost	cost	стоить
cut	cut	cut	резать
dig	dug	dug	копать
draw	drew	drawn	рисовать
do	did	done	делать
drink	drank	drunk	пить
drive	drove	driven	водить (машину)
eat	ate	eaten	есть
fall	fell	fallen	подать
feed	fed	fed	кормить
feel	felt	felt	чувствовать
fight	fought	fought	бороться
find	found	found	находить
fly	flew	flown	летать
forget	forgot	forgotten	забывать
freeze	froze	frozen	замораживать
get	got	got	получать

give	gave	given	давать
go	went	gone	ходить, идти
hang	hung	hung	вешать
have	had	had	иметь
hear	heard	heard	слышать
hide	hid	hidden	прятать
hit	hit	hit	ударять
hold	held	held	держать
hurt	hurt	hurt	повредить
keep	kept	kept	сохранять
know	knew	known	знать
lay	laid	laid	класть
lead	led	led	вести
learn	learnt	learnt	учиться
leave	left	left	оставлять
lend	lent	lent	давать взаймы
let	let	let	позволять
lie	lay	lain	лежать
lose	lost	lost	терять
make	made	made	делать
mean	meant	meant	значить
meet	met	met	встречать
pay	paid	paid	платить
put	put	put	помещать, класть
read	read	read	читать
ride	rode	ridden	ехать
ring	rang	rung	звонить
run	ran	run	бежать
say	said	said	говорить, сказать
see	saw	seen	видеть
sell	sold	sold	продавать
send	sent	sent	посылать
set	set	set	ставить
shake	shook	shaken	трясти
shine	shone	shone	светить

shoot	shot	shot	стрелять
show	showed	shown	показывать
shut	shut	shut	закрывать
sing	sang	sung	петь
sit	sat	sat	сидеть
sleep	slept	slept	спать
smell	smelt	smelt	пахнуть
speak	spoke	spoken	говорить
spend	spent	spent	тратить
spread	spread	spread	распространяться
stand	stood	stood	стоять
steal	stole	stolen	воровать
sting	stung	stung	колоть
swim	swam	swum	плавать
take	took	taken	брать
teach	taught	taught	учить
tear	tore	torn	рвать
tell	told	told	сообщать, сказать
think	thought	thought	думать
throw	threw	thrown	бросать
understand	understood	understood	понимать
wake	woke	woken	просыпаться
wear	wore	won	носить
win	won	worn	выигрывать
write	wrote	written	писать

ЗАКЛЮЧЕНИЕ

Таким образом, учебное пособие «Английский язык в строительных вузах» предназначено для усвоения базовых практических навыков владения английским языком как в профессионально-ориентированной сфере, так и в сфере устной коммуникации.

Работа над обширным и разнообразным учебным материалом, представленным в пособии, будет способствовать заметному повышению уровня профессионально значимых навыков: *говорения, аудирования, чтения, письма и перевода* при соблюдении языковой лексико-грамматической корректности, а также развитию *коммуникативной, профессионально-ориентированной и социально-культурной компетенции*.

Учитывая профессиональную ориентацию студентов, обучающихся в строительном вузе, авторы пособия использовали тексты строительной направленности с учетом их многопрофильности. В соответствии с этим были составлены Терминологические словари к каждому из 10 разделов пособия. В дальнейшем *строительные глоссарии*, представленные в данном пособии, могут активно использоваться и дополняться обучаемыми в процессе самостоятельной профессионально-практической деятельности.

Изложенная в учебном пособии методико-дидактическая стратегия обучения английскому языку в неязыковом (строительном) вузе представляет наряду с эффективными методико-дидактическими *приемами обучения практическому владению английским языком, основные этапы техники прямого и обратного перевода специальной литературы*, последовательно вводимые и подробно интерпретируемые в предлагаемом пособии и отражающие наиболее типичные ситуации, связанные с преобразованием лексических, грамматических или стилистических характеристик исходных единиц общеупотребительного и специального (терминологического) характера. Важное значение имеют практические задания, ориентированные на формирование умений и навыков, связанных с *устным и письменным реферированием* строительных текстов.

Построенная на *дидактических принципах структура пособия* позволяет включать в учебный процесс как теоретические источники для анализа возникающих практических трудностей при переводе специальных (строительных) текстов, так и разнообразные предтекстовые и послетекстовые задания для самостоятельной работы.

Приобретенные знания и навыки обучаемые могут использовать в своей будущей профессионально-практической деятельности, в том числе, в *совместных проектах с зарубежными строительными фирмами, совместной научно-исследовательской деятельности, самостоятельном знакомстве с иностранной аутентичной литературой как по строительным специальностям, так и в целом по различным научно-техническим профилям, а также деловой корреспонденции, деловой коммуникации, обсуждении и подписании договоров и мн. др.*

Немаловажное значение, особенно в свете интеграции Российского образования в Болонский процесс, в свете всеобщей гуманизации образования, имеет формирование не только *профессионально-языковой, но и социально-культурологической компетенции* молодых специалистов, которая позволит им хорошо ориентироваться в другой культурной среде и демонстрировать адекватные навыки и умения коммуникативного поведения. В свою очередь, совместные контакты с зарубежными партнерами, работа с аутентичными материалами и т.п. будут в значительной степени расширять и обогащать как их языковой, так и профессиональный потенциал, создавать условия для их карьерного роста.

Важно подчеркнуть, что учебное пособие закладывает методико-дидактический базис для успешного практического овладения английским языком. В дальнейшем же уровень владения английским языком, его усовершенствование должны определяться большой самостоятельной работой самих обучаемых. С целью дальнейшего усовершенствования языковых знаний можно пожелать студентам строительных вузов получить дополнительное образование по профилю *«Переводчик в сфере профессиональной коммуникации»*, что в значительной степени будет способствовать повышению их конкурентоспособности в эпоху экономической, политической и культурной глобализации.

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Учебное пособие
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ОБУЧЕНИЕ ПЛАТНОЕ

СРОК ОБУЧЕНИЯ – 3,5 года

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