АНГЛИЙСКИЙ ЯЗЫК ДЛЯ СТУДЕНТОВ АРХИТЕКТУРНО-СТРОИТЕЛЬНЫХ СПЕЦИАЛЬНОСТЕЙ

Учебное пособие

ВОРОНЕЖ 2020

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ

Федеральное государственное бюджетное образовательное учреждение
высшего образования

«Воронежский государственный технический университет»

АНГЛИЙСКИЙ ЯЗЫК ДЛЯ СТУДЕНТОВ АРХИТЕКТУРНО-СТРОИТЕЛЬНЫХ СПЕЦИАЛЬНОСТЕЙ

Учебное пособие

Под общей редакцией д-ра филол. наук В. А. Федорова

Воронеж 2020

УДК 802.0(072):72+69+625.7/8
ББК 81.2Англ.я7
А647

Рецензенты:
кафедра естественнонаучных факультетов ВГУ
(зав. кафедрой д-р филол. наук, профессор М. А. Стернина);
Сребрянская Н. А., д-р филол. наук, профессор кафедры английского языка ВГПУ

Авторский коллектив:
Лукина Л. В., Козлова В. В., Лавриненко И. Ю., Гайдук И. В., Нестерова О. Ф., Меркулова Н. В., Крячко Л. Н., Рыжков О. И., Коновалова Ю. С.

Английский язык для студентов архитектурно-строительных
А647 **специальностей:** учебное пособие / Л. В. Лукина [и др.]; под общ. ред. д-ра филол. наук В. А. Федорова; ФГБОУ ВО «Воронежский государственный технический университет». – Воронеж: Изд-во ВГТУ, 2020 – 267 с.

ISBN 978-5-7731-0853-5

Пособие представляет собой коллективную работу преподавателей кафедры «Иностранные языки и технологии перевода», в которой приведены материалы, используемые в преподавании английского языка студентам бакалавриата и специалитета строительных и архитектурных вузов.

Основной целью пособия является подготовка студентов к чтению и пониманию аутентичных текстов по специальности, а также развитие навыков устной речи в пределах пройденной тематики. Особое внимание уделяется расширению словарного запаса по направлениям «Строительство» и «Архитектура» и овладению необходимым уровнем коммуникативной компетенции. Тематика текстов охватывает основные архитектурно-строительные понятия, историю предмета и развития строительного дела, современные строительные технологии.

Издание состоит из семи тематических разделов и включает задания и упражнения на проверку прочитанного, закрепление лексики и формирование навыков письменной коммуникации. Пособие содержит тексты для дополнительного (самостоятельного) чтения.

Предназначено для студентов 1-2 курсов высших учебных заведений архитектурно-строительных специальностей, изучающих английский язык.

Ил. 1. Библиогр.: 11 назв.

УДК 802.0(072):72+69+625.7/8
ББК 81.2Англ.я7

Печатается по решению редакционно-издательского совета Воронежского государственного технического университета

ISBN 978-5-7731-0853-5

ВВЕДЕНИЕ

Учебное пособие «Английский язык для студентов архитектурно-строительных специальностей» построено на базе стандарта курса иностранного языка для неязыковых вузов и рассчитано на профессионально-ориентированный этап обучения.

Основная цель пособия состоит в углубленном изучении терминологии в рамках строительной тематики, развитии умений чтения и перевода оригинальной литературы по специальности, а также совершенствовании навыков устной речи и письма. Данное коллективное пособие направлено на комплексное развитие коммуникативной, когнитивной, информационной, социокультурной, профессиональной и общекультурной компетенций студентов. Пособие нацелено на подготовку студентов к самостоятельной работе с текстом, в том числе и со специальной литературой, обучение устным формам общения на материале предложенных текстов, развитие коммуникативных способностей студентов и расширение их кругозора.

Пособие состоит из 7 разделов, каждый из которых соответствует определенной строительной тематике: «Промышленное и гражданское строительство» («Industrial and Civil Engineering»), «Строительные материалы» («Building Materials»), «Архитектура, градостроительство и реставрация» («Architecture, Restoring and Town Planning»), «Строительство дорог» («Road Engineering»), «Инженерные системы и сооружения» («Engineering Systems and Constructions»), «Экономика и инновации в строительстве» («Economics and Innovation in Construction»), «Компьютерные технологии» («Computing Technologies») и включает два основных текста по специальности, соответствующей наименованию раздела.

Темы, включенные в учебное пособие, подготовлены преподавателями кафедры иностранных языков и технологии перевода ВГТУ:

Part I

О. И. Рыжков – Unit 1. Industrial and Civil Engineering

И. Ю. Лавриненко – Unit 2. Municipal Service and Facilities

И. В. Гайдук – Unit 3. Urban Cadastre

И. Ю. Лавриненко – Unit 4. Geodesy

Part II

И. Ю. Лавриненко, Л. Н. Крячко – Unit 1. Modern Building Materials

Part III

В. В. Козлова – Unit 1. Architecture

В. В. Козлова – Unit 2. Designing and its Development

Л. В. Лукина – Unit 3. Restoration and Conservation

В. В. Козлова – Unit 4. Town Planning

Part IV

Л. Н. Крячко – Unit 1. Road Construction

О. Ф. Нестерова – Unit 2. Bridges and Tunnels

Ю. С. Коновалова – Unit 3. Mechanical Engineering

Part V

И. В. Гайдук – Unit 1. Heating, Ventilation and Air Conditioning

И. В. Гайдук – Unit 2. Water Supply and Water Disposal

О. Ф. Нестерова – Unit 3. Technosphere Safety in Construction

Part VI

Л. В. Лукина – Unit 1. Economics and Finance

О. Ф. Нестерова – Unit 2. Innovation

Н. В. Меркулова – Unit 3. Management

Л. Н. Крячко – Unit 4. Public Relations and Advertising

Part VII

И. Ю. Лавриненко – Unit 1. Digital Technologies

Н. В. Меркулова – Unit 2. Present Robotics

Каждый раздел содержит систему практических заданий, основная цель которых заключается в формировании навыков устного и письменного реферирования научно-технического текста. После завершения работы над основными текстами и следующими за ними упражнениями студенты могут обратиться к текстам для самостоятельной работы, тематически развивающими основной текст и приведенными в конце каждого раздела. Задания после данных текстов выполняются в письменном виде, поскольку письмо является необходимым условием формирования навыков правильной речи на иностранном языке.

Пособие предназначено для студентов бакалавриата и специалитета архитектурно-строительных вузов, а также может быть использовано магистрантами, специалистами-практиками, изучающими самостоятельно английский язык.

Коллектив кафедры выражает благодарность доценту кафедры Козловой В. В. за большую техническую помощь при подготовке учебного пособия к печати, а также доценту кафедры Лукиной Л. В., которая является активным соредактором данного учебного пособия.

PART I
INDUSTRIAL AND CIVIL ENGINEERING

Builders are the key men to create working facilities and living space for the population using late building materials and techniques. 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.

The cadastral service is very important for civil engineering.

Surveyors work alongside other engineers, builders, architects and land developers to define legal land boundaries and provide essential engineering support for urban development, large infrastructure projects, the development and operation of mines and the management of the environment and resources.

Geospatial engineers are the most recent additions to the engineering family. They use new and developing technologies such as GPS, satellite imagery, laser mapping and fast computing to create complex layers of interconnected geographic information.

Surveyors and geospatial engineers use modern satellite, aerial and land-based positioning technology to provide mapping services for flood plain studies, coastal monitoring, natural resource management, agriculture, sustainable development, and many more applications.

1. What's your opinion about builders' services?
2. Is construction very prestige? Why do you think so?
3. What do surveyors do?
4. What are the tasks of geospatial engineers?
5. What modern instruments do surveyors and geospatial engineers use in their work?

Unit 1
Industrial and Civil Engineering

Text 1
Some Basic Problems in Construction

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: problem, solution, research, industry, material, answer, project, structure;
b) прилагательные:civil, economical, great, various, technical, popular;
c) глаголы: keep, help, give, provide, need, offer, reduce, require.

ЗАДАНИЕ 2. Догадайтесь о значении выделенных слов в следующих предложениях.

1. Though **civil engineering** has solved many problems, problems demanding an **engineering solution** still remain in construction.
2. Subjects for research in construction may include **concrete cracks**, the creep and shrinkage characteristics of concrete, deep foundations, methods of **pre-stressing**, etc.
3. Of the various structural materials concrete plain or reinforced, cast-in-place, **precast** or pre-stressed is the material most favored by architects and engineers for structures to show all the technical and economic **advantages**.
4. They are: **flexibility** in design, speed of construction, structural strength.
5. The work of a **draftsman**, a **toolmaker**, a plant operator is indispensable but does not require the imagination.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, где работают строители.

Образец: *Civil engineers can work at <u>construction sites</u>.*

Civil engineers can work at…	a) construction sites b) road and building construction c) construction of heavy structure like bridges or dams d) sewerage design e) navy f) power plants g) space related organizations

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут понять содержание текста:

1) **research**, n – научное исследование
2) **not to keep pace with**, v – не отставать от
3) **engineering problems**, n – строительные проблемы
4) **behaviour**, n – поведение
5) **service conditions**, n – условия эксплуатации
6) **to provide for**, v – обеспечивать
7) **crack**, n – трещина
8) **shrinkage**, n – усадка
9) **plain**, adj – неармированный
10) **reinforced**, adj – армированный
11) **cast-in-place = in-situ**, adj – монолитный
12) **structural materials**, n – конструкционные материалы

13) **precast**, adj – сборный
14) **prestressed**, adj – преднапряженный
15) **flexibility**, n – гибкость
16) **opportunity**, n – возможность
17) **investigation**, n – исследование
18) **conception**, n – понимание, понятие
19) **composite construction**, n – составная конструкция
20) **to reduce**, v – уменьшать
21) **to handle**, v – доставлять
22) **productivity**, n – производительность
23) **delivery**, n – поставка
24) **working operations**, n – производственные операции
25) **supervision**, n – надзор
26) **schedule**, n – график
27) **jobsite**, n – строительная площадка
28) **employment**, n – работа, занятость
29) **indispensable**, adj – необходимый
30) **staff**, n – штат, персонал
31) **to assume**, v – брать
32) **function**, n – функция

ЗАДАНИЕ 5. Прочитайте и переведите текст.

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 behavior 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 pre-stressing, etc.

Site investigationsare 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 pre-stressed is the material most favored 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 pre-stressed 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 pre-stressed concrete unit combined with an in-situ top. By this means the amount of pre-stressed 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 ofmaterials 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.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих слов и словосочетаний:

научное исследование, строительные проблемы, условия эксплуатации, усадка, армированный, сборный, преднапряженный, составная конструкция, производительность, надзор

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Though civil engineering has solved	a) is also of great importance for engineers.
2. Site investigationsare needed	b) of the construction industry is widening.
3. Soil stabilization	c) are varied and extensive.
4. The market for the services	d) many problems.
5. Engineering operations	e) as a basis for the preparation of plans for a given project.

ЗАДАНИЕ 8. Выберите необходимый предлог.

1. Without research modern industry could not keep pace with the ever changing demands **for/on/with** new materials, greater economy and faster operations.
2. It is research that has helped **in/of/with** the solution of many engineering problems.

3. Subjects for research **in/on/from** construction may include concrete cracks, the creep and shrinkage characteristics of concrete, deep foundations, methods of pre-stressing, etc.
4. Site investigationsare needed as a basis **for/from/between** the preparation of plans for a given project.
5. New methods **in/of/to** pre-stressed concrete construction offer the greatest opportunities for further investigation, new conceptions and new forms.
6. New methods in pre-stressed concrete construction offer the greatest opportunities **for/at/in** further investigation, new conceptions and new forms.
7. Today the majority **of/at/about** construction firms have qualified and competent engineers on their staff if their operations are to be carried out efficiently and economically.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. It is research that has helped in the solution of many …
   a) ecological problems; b) general problems; c) engineering problems.
2. Soil stabilizationis also of great importance …
   a) for architects; b) for engineers; c) for builders.
3. By this means the amount of pre-stressed … is reduced, handling problems are simplified.
   a) cement; b) stone; c) concrete.
4. The market for the services of the … industry is widening.
   a) construction; b) manufacture; c) building.
5. Engineers do have their problems and … them in the most economical and safest way.
   a) fix; b) work out; c) solve.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Хотя гражданское строительство решило много проблем, требующих инженерного решения, многие все еще остаются в строительстве. (Though civil engineering has solved many problems, problems demanding an engineering solution still remain in construction.)
2. Именно исследования помогли решить многие инженерные проблемы. (It is research that has helped in the solution of many engineering problems.)
3. Геодезические и геологические изыскания на стройплощадке необходимы в качестве основы для подготовки планов для данного проекта. (Site investigations are needed as a basis for the preparation of plans for a given project.)
4. Они (геодезические и геологические изыскания) предоставляют информацию для экономичного проектирования фундаментов для зданий.

(They provide the information for economical design of foundations for buildings.)

5. Стабилизация почвы также имеет большое значение для инженеров. (Soil stabilization is also of great importance for engineers.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Though civil engineering has **s**… many problems, problems demanding an engineering solution still remain in **c**… . Only **r**… gives the answers to the problem of behavior of structures under service conditions and **p**… detail information for design purposes. Site **i**… are needed as a basis for the preparation of plans for a given project. They provide the information for economical design of **f**… for buildings. Soil **s**… is also of great importance for engineers.

ЗАДАНИЕ 12. Ответьте на следующие вопросы об основных проблемах в строительстве.

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 inVoronezh?

ЗАДАНИЕ 13. Составьте рассказ об основных проблемах в строительстве по следующему плану, используя слова, данные в скобках.

1. Проблемы, требующие технического решения в строительстве (problems, civil engineering, solution, construction).
2. Научное исследование (research, materials, solutions, engineering problems, design).
3. Строительныематериалы (structural materials, new methods, pre-stressed concrete).
4. Составные конструкции (composite construction, pre-stressed concrete, bridges and house – building, job site).
5. Специалисты (specialists, qualified and competent engineers, draftsman, toolmaker, a plant operator, engineers).

Text 2
Engineering and Its Present Status

ЗАДАНИЕ 1. Прочитайте следующие интернациональные слова и найдите их значения в тексте:

a) существительные: energy, structure, machine, product, material, phase, project, nature, technique, problem, profession;
b) прилагательные: engineering, creative, global;
c) глаголы: to design, to progress.

ЗАДАНИЕ 2. Догадайтесь о значении выделенных слов в следующих предложениях.

1. Engineering is the art and science by which the **properties** of matter and energy are made useful to man in structures, machines and products.
2. Civil engineering is **defined** as that phase of engineering which deals with the planning, design and construction of projects.
3. The **application** of engineering techniques to construction makes civil engineering the only factual approach to construction problems.
4. 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.
5. Customers are more selective and require production **tailored** for specific needs, delivered quickly and anywhere with no **reduction** in quality.

ЗАДАНИЕ 3. Познакомьтесь со словами и словосочетаниями, которые помогут понять содержание текста:

1) **to shape**, v – принимать форму
2) **to fit**, v – устанавливать
3) **to standup**, v – выдерживать
4) **to break**, v – разрушать
5) **to catch fire**, v – загореться
6) **to define**, v – определять
7) **to deal with**, v – иметь дело с
8) **to lay the foundation**, v – закладывать фундамент
9) **to enable**, v – давать возможность
10) **execution**, n – выполнение
11) **engineering techniques**, n – технические средства
12) **factual approach**, n – фактический подход
13) **strikingly**, adv – удивительно
14) **bulk of engineering**, n – объём инженерного искусства
15) **to allow**, v – предоставлять

16) **off-the-shelf approach**, n – стандартный подход
17) **to customize**, v – выполнять по индивидуальному заказу
18) **technical design**, n – техническое проектирование
19) **environmental compliance**, n – соответствие с окружающей средой
20) **diversity**, n – разнообразие
21) **affinity**, n – близость
22) **creative**, adj – творческий
23) **to expect**, v – ожидать
24) **tailored**, adj – приспособленный
25) **selective**, adj – избирательный

ЗАДАНИЕ 4. Прочитайте и переведите текст

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 naturalresources 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.

ЗАДАНИЕ 5. Найдите в тексте английские эквиваленты следующих слов и словосочетаний:

принимать форму, выдерживать, загореться, определять, иметь дело с, закладывать фундамент, технические средства, объём инженерного искусства, техническое проектирование, приспособленный.

ЗАДАНИЕ 6. Соедините слова с их определениями.

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 made	f) a drawing showing how something is to be
7. specific needs	g) a manner or method of doing something

ЗАДАНИЕ 7. Выберите необходимый предлог.

1. Engineering is the art and science by which the properties of matter and energy are made useful to man **in/of/with** structures, machines and products.
2. Civil engineering is defined as that phase **under/of/between** engineering which deals with the planning, design and construction of projects.
3. The branch of civil engineering provides for the initial development **of/in/to** naturalresources and lay the foundation for other technical progress.
4. There are greatest opportunities today for civil engineers **in/on/from** construction than at any previous time in the history of our country.
5. Engineering works have been built for the use and convenience **of/between/about** man.
6. Builders have constructed the tallest, longest, largest and deepest structures **of/in/to** history.

ЗАДАНИЕ 8. Выбрав правильный вариант, закончите следующие предложения.

1. Engineering is the art and science by which the properties of matter and energy are made useful to man in …
   a) structures, machines and goods; b) buildings, cars and products; c) structures, machines and products.
2. The branch of civil engineering provides for the initial development of natural resources and lay the foundation for other …
   a) scientific progress; b) technical progress; c) modern progress.
3. There are greatest opportunities today for … in construction than at any previous time in the history of our country.
   a) civil engineers; b) country-planning engineers; c) structural engineers.
4. The application of engineering techniques to construction makes civil engineering the only factual approach to …
   a) design problems; b) construction problems; c) architectural problems.
5. Engineering tasks nowadays are different from those … when stable business structures allowed off-the-shelf approach to technical design.
   a) 5-15 years ago; b) 10-20 years ago; c) 10-15 years ago.

ЗАДАНИЕ 9. Опровергните следующие утверждения.

1. Engineering is not a constantly changing and developing profession.
2. Engineering works have been built for the use and convenience of nature.
3. The need to develop products and services faster, cheaper and better than ever before is doubtful.

ЗАДАНИЕ 10. Переведите следующие предложения на английский язык.

1. Инжиниринг – это искусство и наука, благодаря которым свойства вещества и энергии становятся полезными для человека в сооружениях, машинах и изделиях.
2. Гражданское строительство – это та часть инжиниринга, которая занимается планированием, дизайном и строительством проектов.
3. Сегодня у гражданских инженеров в строительстве самые большие возможности, чем в любой другой период в истории нашей страны.
4. Применение инженерных технологий в строительстве делает гражданское строительство единственным фактическим подходом к решению строительных проблем.
5. Очевидно, что необходимо разрабатывать продукты и услуги быстрее, дешевле и лучше, чем когда-либо прежде.
6. Клиенты более разборчивы и требуют производства с учетом конкретных потребностей, быстрой доставки в любое место без снижения качества.

7. Строители построили самые высокие, самые длинные, самые большие и глубокие сооружения в истории.
8. В результате человечеству в 21-м веке становится лучше с правильной пищей, санитарией, жильем и всеми материальными благами, которые современная наука, инженерия и промышленность может предоставить.

ЗАДАНИЕ 11. Ответьте на следующие вопросы о гражданском строительстве.

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".

ЗАДАНИЕ 12. Составьте рассказ о гражданском строительстве по следующему плану.

1. Engineering as a constantly developing profession.
2. Modern problems in construction.
3. Engineering tasks.
4. Present designs.
5. Demand for engineers' services.
6. Significance of industrial construction.

Тексты для самостоятельной работы по теме «Industrial and Civil Engineering»

Text A

Прочитайте текст и выполните задание.

What is Civil Engineering?

Civil engineering is one of the oldest engineering disciplines, since civil engineers of one form or another have been around ever since humans started

building major public works such as roads, bridges, tunnels, and large public buildings. It is also an incredibly broad discipline, spanning treatment of environmental issues, transportation, power generation, and major structures. To become a civil engineer, a person must typically study engineering at a university and then participate in field work for practical training. Many nations also require that students pass a competency exam to ensure that they will be able to design and build safe, stable structures.

There are many branches of civil engineering, and a wide range of specialties. Some engineers focus on conception and initial design of a project, analyzing the site, the needs, and the resources to come up with a workable project plan. Others specialize in contracting, physically building the structure, managing the site crew, and handling materials and supply. In other cases, civil engineers focus on maintenance of the project after it is completed, to make sure that it is safe and useful.

Most people pick a focus while they are receiving an education. Engineers who focus on transportation, for example, might choose to specialize in building bridges, tunnels, and roads. Others might lean towards power generation facilities, water treatment, waste management, construction of light railways and subways, or other disciplines. In all cases, extensive training is undertaken so that the prospective civil engineer understands his or her chosen field in depth. Behind every major public works is a team of civil engineers.

One of the primary concerns of civil engineering is public safety and health. A value is also placed on building structures that are functional, efficient, and also aesthetically pleasing. Structural soundness, conformity with local codes, and functionality are all issues which are faced in the discipline. Some civil engineers work directly for the public in the form of government agencies, while others find employment with public firms.

Education does not end with a degree and a course of fieldwork with trained and experienced civil engineers. Continuing education is also an important part of this discipline. As advances are made in the field, engineers are expected to keep pace with them, especially when the advances improve safety for workers and the public. There are many trade journals and annual conferences in the field to keep engineers updated.

WRITING TASK

1. Напишите эссе на английском языке о гражданском строительстве.
2. Подготовьте презентацию на английском языке о том, какие требования необходимо выполнить претенденту для устройства на работу на должность инженера-строителя.

Text B

Прочитайте текст и выполните задание.

Civil Engineers in the USA

Civil engineers are highly trained professionals who plan public works projects and supervise their implementation. Most work in the private sector, but a good portion of them work in government. Their work is all around us. The infrastructure that moves people and commerce around the country was designed and implemented under the guidance of generations of civil engineers.

What Civil Engineers Do

Civil engineers design and supervise construction of major public works projects such as buildings, highways, airports, bridges, and dams. They can either work for a government organization or in private industry competing for government contracts. Since there are so many different types of projects a civil engineer can undertake, many of them specialize in a type of project or branch of the profession such as transportation engineering, structural engineering or geotechnical engineering.

Much of the work is done in an office, but civil engineers also go to project sites to monitor construction. They ensure projects are going according to plan and answer any questions construction superintendents raise.

From time to time, civil engineers speak about projects to governing boards and the general public. They also write documents about the project like responses to requests for proposals, status updates, and technical reports. Civil engineers in the private sector work closely with government contract managers.

In addition to a college degree in civil engineering or one of its specialties, civil engineers who sign off on project plans or supervise other civil engineers must be licensed according to rules enacted by state governments. Licensing processes include several exams and require years of work experience. In the end, licensed civil engineers earn the designation of a professional engineer (or PE).

Characteristics of Civil Engineers

Civil engineering requires a broad skill set. One of the most critical elements to succeeding is project management. Some plans can be drawn in relative isolation, but bringing plans to life requires a team, and a civil engineer is the leader of such a team. Where team members' individual work meets with that of others, the civil engineer makes sure it all fits together. All the skills that must be brought to any project must be applied to public works projects. Civil engineers hold others accountable while ensuring a public works project is completed on time, on budget and up to quality expectations.

Civil engineers are good problem solvers. When documented plans do not match reality, civil engineers devise solutions that keep within a project's framework. They answer questions about the project when those executing parts of the project need clarification.

Proficiency in advanced mathematics is essential to civil engineering. Geometry and calculus are obvious necessities. Of course, computer programs can solve equations in a matter of milliseconds, but civil engineers must know what those figures mean and apply them to plans. People outside the core group working on a public works project do not understand these mathematical areas to the extent civil engineers do, but those who make decisions about a public works project's direction understand business math. Civil engineers provide cost estimates and devise budgets. They need buy-in from decision makers on the money side of things so they can actually put their geometry and calculus skills to productive use.

Projects often have many governmental entities involved. Work on an interstate highway could involve entities in federal, state and local governments. On some projects, more than one government organization provides financial support. Elected officials and public administrators pay more attention to projects they back financially than to those merely happening in their geographical proximity. For instance, a city council is aware of road projects in the county, but it is involved in road projects within the city limits.

WRITING TASK

1. Напишите эссе на английском языке о профессии инженера-строителя в США.
2. Подготовьте презентацию на английском языке о том, чем занимаются инженеры-строители, трудоустройстве и зарплатах.

Unit 2
Municipal Service and Facilities

Text 1
City Infrastructure

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на часть речи:

a) существительные: infrastructure, economy, services, component, strategy, urbanization, geography, tradition, function;
b) прилагательные: basic, principle, municipal;
c) глаголы: adopt, vary, urbanize.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Municipal services in any city depend on **location**, history, geography, **statutes** and tradition.
2. City infrastructure forms **basis** for the economy and quality of life of a city.

3. Energy **consumption** plays **key** roles in every city infrastructure.
4. High **concentration** of industry consumes large amounts of energy.
5. Increasing mobility and connectivity in cities bring enormous **benefits** to society.

ЗАДАНИЕ 3. Используя выражения, данные справа, скажите, какие компоненты составляют городскую инфраструктуру.

1. The common types of city infrastructure are …	a) heating b) water cooling c) IT infrastructure
2. Basic city services include …	d) sanitation e) public library f) schools g) police

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **to include** – включать в себя
2) **soft infrastructure** – социальная (нематериальная) инфраструктура
3) **heating** – отопление
4) **lighting** – освещение
5) **to develop** – развивать
6) **to implement** – внедрять
7) **sustainability** – устойчивое развитие
8) **urban** – городской, городская среда
9) **conurbation** – конурбация, большой город с пригородами
10) **waste management** — управление ликвидацией отходов, отведением и очисткой сточных вод
11) **greenhouse gases** – газы, вызывающие парниковые эффект
12) **congestion** – перенаселение

ЗАДАНИЕ 5. Прочитайте и переведите текст.

City Infrastructure

City infrastructures are structures and services that act as a basis for the economy and quality of life of a city. This includes both hard infrastructure such as bridges and soft infrastructure such as IT services. The common types of city infrastructure are: District Heating, Deep Water Cooling, Lighting, IT Infrastructure, Security, Landscaping, etc.

City infrastructure objects are basic components of urban planning procedure. Urban planning is the practice of developing and implementing city strategy, policy and design. Cities typically adopt foundational goals and principles of sustainability, resilience and quality of life. Urban is a human settlement with high population density and infrastructure. Urban areas are created through urbanization and are categorized as cities, towns, conurbations or suburbs.

Municipal services or city services are basic services that the city government provide to the residents of a city. Basic city services include sanitation (both sewer and refuse), water, streets, the public library, schools, food inspection, fire department, police, ambulance, and other health department issues and transportation. The available municipal services for any individual municipality will depend on location, history, geography, statutes and tradition. Provided services may vary from country to country or even within a country.

There are 3 major municipal services that play key roles in every city infrastructure: energy consumption and distribution, water supply, transportation and waste management.

Urban areas play a key role in energy production and consumption. Energy is a major component for both local and global economic development. It is needed for transport, industrial and commercial activities, buildings and infrastructure, water distribution, and food production. With their high concentration of industry, transport systems, buildings and households, municipalities consume large amounts of energy (estimated between 60 and 80% of the global primary energy) and emit between 50 and 60% of the world's total greenhouse gases. The majority of this energy consumption goes into buildings and transport.

Another important municipal service is mobility. Cities need to provide transportation infrastructure that increases accessibility but at the same time reduces pollution, congestion and greenhouse gas emissions. Increasing mobility and connectivity in cities bring enormous benefits to society. It also provides the essential means by which a city can function and develop effectively.

One more important aspect of municipal services is water resources distribution. Prioritizing water and sanitation issues is crucial in the overall urban development, because the quality of water have tangible impacts on education and economic activities.

Waste management is an important municipal service. As countries urbanize, production and consumption patterns change, which in turn results in increasing amounts of waste. Thus, municipal services are responsible for controlling waste in cities. Successful waste management can reduce negative impacts and may help to use city resources efficiently.

All in all, city is a complex infrastructure with many areas of control. Wise management of municipal services is very important for any society, because it influences people`s health, wellbeing, local and global environment and economy in general.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

сложная инфраструктура, ощутимое влияние, ключевая роль, глубоководное охлаждение, материальная инфраструктура, плотность населения, проверка качества продуктов, месторасположение, главная составляющая, потребление, ответственный, успешный.

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. City infrastructure includes …	a) categorized as cities, towns or suburbs.
2. Urban areas are …	b) needed for transport, industrial and commercial activities.
3. Services may …	c) a complex infrastructure with many areas of control.
4. Energy is …	d) both hard infrastructure and soft infrastructure.
5. City is …	e) vary from country to country.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. City infrastructure objects are basic components … urban planning procedure.
2. Connectivity in cities brings enormous benefits … society.
3. Urban is a human settlement … high population density.
4. The available municipal services will depend … location, history, geography.
5. Buildings, households and municipalities emit … 50 and 60% of the world's total greenhouse gases.
6. The quality … water influences education and economic activities.
7. Waste management reduces negative impacts and helps … use city resources efficiently.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите (дополните) следующие предложения.

1. Cities need to provide transportation infrastructure that …
   a) results in increasing amounts of waste; b) influences economy in general;
   c) increases accessibility but at the same time reduces pollution.
2. Industry, transport systems, buildings and households, municipalities consume …
   a) large amounts of energy; b) greenhouse gases; c) little amount of resources.
3. The majority of this energy consumption goes into…
   a) buildings and transport; b) heating; c) water resources distribution.
4. City infrastructure includes ... infrastructure such as bridges and … infrastructure such as IT services.
   a) soft … hard; b) hard … soft; c) light ….. heavy.

5. Wise management … economy in general.
a) increases; b) reduces; c) influences

ЗАДАНИЕ 10. Опровергните словами из текста, что:

1. The available municipal services for any individual are the same.
2. There are 5 major municipal services that play key roles in every city infrastructure.
3. Prioritizing water and sanitation issues isn`t very important for society.

ЗАДАНИЕ 11. Подтвердите словами из текста, что:

1. Существует несколько типов городских структур.
2. Городские территории играют важную роль в производстве и потреблении энергии.
3. Важно увеличивать мобильность и транспортную доступность между городами.
4. Важно улучшать качество услуг по водоснабжению и сохранению безопасности водных ресурсов.
5. С ростом производства увеличивается количество отходов.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is city infrastructure? (structures and services; a basis for the economy)
2. What may basic city services include? (hard infrastructure; bridges; soft infrastructure)
3. How can a city function and develop effectively? (mobility; connectivity)
4. Why is prioritizing water and sanitation issues crucial in the overall urban development? (quality of water; tangible impacts)
5. What services are responsible for controlling waste in cities? (municipal services)
6. Why is wise management important for society? (people`s health; wellbeing, local and global environment; economy)
7. There are two main types of city infrastructure, aren`t there? (hard; soft)

ЗАДАНИЕ 13. Расскажите о городской инфраструктуре по следующему плану, используя слова, данные в скобках.

1. The role of city infrastructure and its main components (structures and services, quality of life, hard infrastructure, soft infrastructure, common types).
2. City Planning, types of cities (city strategy, policy and design, goals and principles, cities, towns, conurbations or suburbs).

3. The role of municipal services in town planning (basic city services, consume energy, greenhouse gases, buildings and transport).
4. The types of municipal services (mobility, connectivity, develop effectively, water resources distribution, waste management).
5. The importance of municipal service (people`s health, wellbeing, local and global environment, economy).

Text 2
City Facilities

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на часть речи:

a) существительные: service, category, hospital, object, department, infrastructure, electricity, gas, sanitation, mobility;
b) прилагательные: social, economic, modern;
c) глаголы: associate, invest, incorporate, analyze.

ЗАДАНИЕ 2. Прочитайте предложения и догадайтесь о значении выделенных слов.

1. **Urban** area includes cities, towns and suburbs.
2. Heating, electricity and water supply play **vital** role in functionality of every community.
3. Schools provide a **location** for social activities.
4. Administration office or **entity** of this agency is in the city center.
5. Societal **security** should provide people with safe environment for living.

ЗАДАНИЕ 3. Используя выражения, данные справа, скажите, какие объекты городской инфраструктуры относятся к данным категориям.

1. The educational facilities are …	a) kinder gardens
2. The health facilities include …	b) medical center
3. The government assets involve …	c) schools
	d) fire service station
	e) administration office
	f) universities
	g) hospital
	h) clinic
	i) police

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **facilitiy** – удобство, объект
2) **sustainable community** – зд. стабильно развивающееся общество
3) **achievement** – достижение
4) **cohesive** – крепкий, жизнеспособный
5) **citizen** – гражданин
6) **land use** – землепользование
7) **fire services station** – пост пожарной станции
8) **built environment** – преобразованная человеком среда
9) **accessibility** – доступность
10) **well-being of individuals** – благосостояниелюдей
11) **resilience** – стойкость, прочность
12) **sewer systems** – канализационные системы
13) **security measures** – меры безопасности
14) **vulnerability**– уязвимость
15) **preservation** – сохранность
16) **assets** – имущество, собственность

ЗАДАНИЕ 5. Прочитайте и переведите текст.

City Facilities

Public facilities play an essential role in providing support services to create viable, sustainable, healthy and cohesive communities, overcoming social barriers and raising achievement. They refer to all of the services/facilities which are required by an urban area to provide the necessary and essential functions for its citizens. All of them perform vital roles within the overall operation of the urban area.

These facilities are divided into several categories:

1) educational: these are the land uses and buildings that are used to serve the educational purposes of the community. They very often have a secondary function of providing a location for social and recreational activities of the community;

2) health: this category of urban object includes all facilities where medical treatment is offered, for example, a local GP clinic or a city hospital. This category also includes all object related to the diagnosis, treatment and rehabilitation of people;

3) government assets: these are buildings and facilities relating to government departments or entities, for example, administration office associated with a government department or agency, police and fire services stations, etc.

The facilities mentioned above make up parts of urban infrastructure – the built environment that includes buildings and transport, as well as electricity, gas, water and sanitation connections. Public services generally require good possibilities for mobility, e.g. public buildings should have a good accessibility.

The economic function of social infrastructure is to provide for the well-being of individuals, families and communities. Investment in social infrastructure is important for maintaining quality of life and to develop the skills and resilience essential to strong communities. The main elements of infrastructure include the following: Transport; Sanitation; Water supplies; Waste disposal; Telecommunications.

Social infrastructure is as important for the successful development of a modern economy as more physical infrastructure such as roads, utility facilities, and sewer systems. Social infrastructure such as schools, theatres and sport facilities make people want to live in a certain area, which subsequently attracts businesses and other investors that provide for jobs and income. In the case of public services and facilities, societal security should be a natural frame for identification of vulnerability and enhancement of resilience. Thus, urban planning practice has to incorporate appropriate security measures for protection of urban objects.

Adequate management and maintenance of the living environment ensures the preservation and value of the property. The management of housing objects involves analyzing the existing situation and updating the technical documentation of the facility.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

важная роль, городская территория, образовательные цели, развлекательные мероприятия, водопроводные коммуникации, общественные услуги, водоснабжение, успешное развитие, современная экономика, городское планирование.

ЗАДАНИЕ 7. Образуйте существительные из следующих глаголов, используя суффиксы: **-tion, -ment, -ity**.

achieve, educate, locate, treat, govern, administrate, sanitate, connect, develop, secure, protect, manage.

ЗАДАНИЕ 8. Соедините части предложений по смыслу.

1. Economic function of social infrastructure is …	a) used to serve for social and recreational activities of the community.
2. Educational facilities are …	b) are buildings and facilities relating to agency, police and fire services stations.
3. Health services are …	c) incorporates appropriate security measures for protection of urban objects.
4. Urban planning practice …	d) to provide well-being of individuals, families and communities.
5. Government assets …	e) related to the diagnosis and treatment.

ЗАДАНИЕ 9. Выберите подходящее по смыслу слово, соответствующее информации в тексте.

1. Social infrastructure functions to provide the well-being of individuals, families and villages/communities/ facilities.
2. Physical infrastructure such as roads, utility facilities, and water/ sewer/ city systems are as important for the successful development of a modern economy as social infrastructure.
3. Urban planning practice has to incorporate appropriate security measures for/ about/ in protection of urban objects.
4. Adequate/ inadequate/ vulnerable management and maintenance of the living environment ensures the preservation and value of the property.
5. Objects of social infrastructure perform vital roles on/ at/ within the overall operation of the urban area.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Объекты городской инфраструктуры важны для благосостояния общества.
2. Существует несколько категорий объектов инфраструктуры.
3. Инвестирование объектов социальной инфраструктуры важно.
4. В планировании инфраструктуры города нужно учитывать безопасность населении.
5. Общественные объекты должны быть территориально доступными.

ЗАДАНИЕ 11. Ответьте на вопросы, используя слова, данные в скобках.

1. What is the function of public facilities? (support services; communities; social barriers)
2. How are public facilities categorized? (educational; health; government assets)
3. What is the difference between educational and government assets? (serve the educational purposes; relate to government departments)
4. How do you understand the phrase: “possibilities for mobility”? (good accessibility)
5. What are the examples of the objects of social infrastructure and what is its main function? (schools; theatres and sport facilities; successful development).

ЗАДАНИЕ 12. Расскажите о городских объектах, выполнив перевод информации в тексте на английский язык.

Public facilities play an essential role in the life of society, because they provide (жизнеспособное, здоровое и стабильно развивающееся общество). They refer to all of the (приспособления) which are required by an (городская территория), because they provide the (необходимый) and essential functions for its (граждане). These facilities (подразделяются на несколько категорий).

(Образовательные объекты) are the land uses and buildings that are used to serve the educational purposes of the community. (Здравоохранительные структуры) includes all facilities where medical treatment is offered. (Объекты правительственной собственности) these are buildings and facilities relating to (правительственные учреждения). The facilities of urban structure (включают: здания, транспортную систему, электро-, газо-, водопроводные системы).

(Экономическая функция) of social infrastructure is to provide for the (благосостояние человека и всего общества). The objects of physical infrastructure (такие как дороги, коммунальные сооружения, канализационные системы) are important for the successful development of a modern economy. (Объекты социальной инфраструктуры, такие как школы, театры, спортивные сооружения) make people want to live in a certain area.

(Разумное распоряжение и поддержка) of the living environment ensures the (сохранность частной собственности).

Тексты для самостоятельной работы по теме «Municipal Service and Facilities»

Text A

Прочитайте текст и выполните задание.

Urban Economy

Urban economy is focused on promoting urban strategies and policies that strengthen the capacity of cities to realize their full potential as drivers of economic development, and of wealth and employment creation. Special attention is paid to the formulation and implementation of urban strategies and policies that enhance municipal finance and contribute to the creation of decent urban jobs and livelihoods.

Looking at land use within metropolitan areas, the urban economist seeks to analyze the spatial organization of activities within cities. The urban economist also examines the intra-city location choices of firms and households. Considering the spatial organization of activities within cities, he or she determines the price of land and why those prices vary across space. They also determine the economic forces that caused the spread of employment from the central core of cities outward, identify zoning, and interpret how such controls affect the urban economy.

Market forces in the development of cities relate to how the location decision of firms and households causes the development of cities. The nature and behavior of markets depends somewhat on their locations therefore market performance partly depends on geography. If a firm locates in a geographically isolated region, their market performance will be different than a firm located in a concentrated region. The location decisions of both firms and households create cities that differ in size and economic structure.

By looking at location decisions of firms and households, the urban economist is able to address why cities develop where they do, why some cities are large and others small, what causes economic growth and decline, and how local governments affect urban growth.

WRITING TASK

Напишите эссе на английском языке на тему «Особенности организации народного хозяйства моего родного города».

Text B

Прочитайте текст и выполните задание.

Hard Infrastructure

There are two main types of infrastructure within an urban area. Hard infrastructure is the physical infrastructure of roads, bridges etc., as opposed to the soft infrastructure of human capital and the institutions that cultivate infrastructure. The first includes the built environment, meaning the physical connections between places that carry people, materials, information and energy. These 'fixed' things include roads, railways, pipes, and cables.

Any accessory buildings, plants, or vehicles are also an essential part of the system. Also included are fleets of vehicles operating according to schedules such as public transit buses and garbage collection, as well as basic energy or communications facilities such as oil refineries, radio, and television broad casting facilities.

Hard infrastructure in general usually has the following attributes:

Capital assets that provide services

These are physical assets. The people employed in the hard infrastructure sector generally maintain, monitor, and operate the assets, but do not offer services to the clients or users of the infrastructure.

Large networks

These are large networks constructed over generations, and are not often replaced as a whole system. The network provides services to a geographically defined area, and has a long life because its service capacity is maintained by continual refurbishment or replacement of components as they wear out.

Historicity and interdependence

The system or network tends to evolve over time as it is continuously modified, improved, enlarged, and as various components are rebuilt, decommissioned or adapted to other uses.

Natural monopoly

The systems tend to be natural monopolies, insofar that economies of scale means that multiple agencies providing a service are less efficient than would be the case if a single agency provided the service. This is because the assets have a

high initial cost and a value that is difficult to determine. Once most of the system is built, the marginal cost of servicing additional clients or users tends to be relatively inexpensive.

In public economics theory, infrastructure assets such as highways and railways tend to be public goods, in that they carry a high degree of non-excludability, where no household can be excluded from using it, and non-rivalry, where no household can reduce another from enjoying it. These properties lead to externality, free ridership, and spillover effects that distort perfect competition and market efficiency.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Объекты материально-технической инфраструктуры в малонаселенных территориях».

Unit 3
Urban Cadastre

Text 1
Land Administration in the UK

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: interests, control, system, administration, idea, registration, reality, information, block, concept;
b) прилагательные: geometric, physical, economic, geographical, official, legal, private;
c) глаголы: organize, limit, exercise.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. The UK has **records** of interests in land.
2. The idea of an estate is the relationship between the **landholder** and his land.
3. The **data** is organized according to the **physical location** of the estates.
4. The second issue concerns the geo-coordinates of the **properties**.
5. There is no government record of **legal boundaries**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, расскажите о специфике земельного управления в Великобритании.

Образец*: The UK has records of interests in land, their ownership and control, and their value.*

1. The UK has … 2. The UK doesn't have …	a) a genuinely parcel-based system b) the notion of proprietary estates c) the concept of dominium or direct ownership of the land itself d) the concept of an estate e) the concept of a hereditament f) record of private boundaries

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **parcel** – земельный участок
2) **interests in land** – права на землю
3) **parcel-based system** – система, основанная на земельных участках
4) **estate** – земельный участок, земельное владение
5) **proprietary estates** – земельные участки, находящиеся в собственности
6) **dominium** – право владения
7) **proprietors** – правообладатели, владельцы
8) **to own** – владеть
9) **concept** – понятие
10) **real estate tax** – налог на недвижимость, налог на землю
11) **hereditament** – недвижимое имущество
12) **legal power** – юридическая сила
13) **to fix private boundaries** – установить частные границы
14) **Ordnance Survey** – Управление геодезии и картографии

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Land Administration in the UK

The UK has records of interests in land, their ownership and control, and their value. What it does not really have is either a genuinely parcel-based system or one that accurately records geometric descriptions of the areas under the ownership or control of the different interests in land. The land administration system is built around the notion of proprietary estates rather than land as a physical reality. The idea of an estate is the relationship between the landholder and his land. English law does not have a concept of dominium or direct ownership of the land itself. Rather, proprietors own estates in (that is to say, rights over) land.

The concept of estate means that it is of limited value to organize data by parcel. Ownership of the parcel is, in any case, impossible as one can only own interests in it. Rather, the only sound way to organize data is by proprietary estates. An individual can have more than one proprietary estate so the data is organized according to the physical location of the estates. The link between the concept of an estate and the

physical reality on the ground can be provided, in practice, by something that in British real estate taxes is known as a hereditament, though this is not a term used in land registration. A hereditament is a property that forms a single economic unit for real estate tax purposes with a single occupier comprising a single geographical unit, being capable of separate occupation and put to a single use. A hereditament could comprise several parcels. The hereditament rather than the parcel is a suitable building block for land information since, as an economic unit, it brings together the concept of an estate (the rights and interests) and the physical area over which they are exercised.

The second issue concerns the geo-coordinates of the properties. There is no government record of legal boundaries of properties and therefore no official geometric description of the property. The Ordnance Survey maps boundaries and the features that comprise them. Since 1841 it has been required to show boundaries. However, it has no legal power to fix private boundaries.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) учет прав на землю	a) landholder
2) управление земельными ресурсами	b) direct ownership
3) владелец или арендатор земельного участка	c) records of interests in land
4) прямое (непосредственное) владение	d) land administration system
5) право собственности на земельный участок	e) economic unit
6) земельная регистрация	f) ownership of the parcel
7) экономическая единица	g) land registration
8) в целях налогообложения недвижимости	h) geo-coordinates of the properties
9) единственный владелец	i) to map
10) гео-координаты собственности	j) for real estate tax purposes
11) показать границы	k) a single occupier
12) наносить на карту, картографировать	l) to show boundaries

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1.The land administration system of the UK is built around the notion of …	a) the physical location of the estates.
2.The idea of an estate is the relationship between …	b) dominium or direct ownership of the land itself.

3.English law does not have a concept of …	c) proprietary estates rather than land as a physical reality.
4. The data is organized according to …	d) a property that forms a single economic unit for real estate tax purposes.
5.A hereditament is …	e) the landholder and his land.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The UK has records … interests … land, their ownership and control, and their value.
2. Ownership … the parcel is impossible as one can only own interests … it.
3. The link between the concept … an estate and the physical reality … the ground can be provided, … practice, … a hereditament.
4. A hereditament is a property that forms a single economic unit … real estate tax purposes … a single occupier comprising a single geographical unit.
5. There is no government record … legal boundaries … properties and therefore no official geometric description … the property.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. The land administration system in the UK is built around the notion of …
   a) proprietary estates; b) land as a physical reality.
2. A hereditament could comprise …
   a) one parcel; b) several parcels.
3. A suitable building block for land information in the UK is …
   a) the hereditament; b) the parcel.
4. English law does not have a concept of …
   a) the hereditament; b) dominium.
5. The Ordnance Survey has no legal power to fix …
   a) private boundaries; b) any boundaries.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. В Соединенном Королевстве есть учетные записи о правах на землю, о собственности на земельные участки, контроле над ними, а также их стоимости.
   (The UK has records of interests in land, their ownership and control, and their value).
2. Система управления земельными ресурсами строится вокруг понятия собственности, а не земли как физической реальности.
   (The land administration system is built around the notion of proprietary estates rather than land as a physical reality).

3. В английском праве нет понятия права владения или прямой собственности на землю как таковую.
   (English law does not have a concept of dominium or direct ownership of the land itself).
4. Физическое лицо может иметь более одного имущественного права собственности, поэтому данные организованы в соответствии с физическим местонахождением участков.
   (An individual can have more than one proprietary estate so the data is organized according to the physical location of the estates).
5. Недвижимое имущество, а не земельный участок, является подходящим строительным блоком для земельной информации.
   (The hereditament rather than the parcel is a suitable building block for land information).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

The land administration system in the UK is built around the notion of proprietary **e**… rather than land as a physical reality. The idea of an estate is the relationship between the **l**… and his land. English law does not have a concept of **d**… or direct ownership of the land itself. Rather, proprietors own **e**… in land. Thus the only sound way to organize data is by **p**… estates. The link between the concept of an estate and the physical reality on the ground can be provided by something that in British real estate taxes is known as a **h**… . It is a property that forms a single economic unit for real estate **t**… purposes. It is a suitable building block for **l**… information. The second issue concerns the geo-co-ordinates of the properties. The Ordnance Survey maps **b**… and the features that comprise them.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What notion is the land administration system in the UK built around? (to be built around; the notion of proprietary estates)
2. What is the idea of an estate? (the relationship between the landholder and his land)
3. Does English law have a concept of dominium or direct ownership of the land itself? (a concept of dominium; direct ownership of the land itself)
4. What does the concept of estate mean? (to be of limited value; to organize data by parcel)
5. What is the only sound way to organize data? (the only sound way; to organize data by proprietary estates)
6. What is a suitable building block for land information in the UK? (the hereditament; the parcel; a suitable building block for land information)
7. What are the duties of the Ordnance Survey? (to map boundaries and the features that comprise them; no legal power to fix private boundaries)

ЗАДАНИЕ 13. Расскажите о земельном управлении в Великобритании по следующему плану, используя слова, данные в скобках.

1. The notion of proprietary estates (the notion of proprietary estates; land as a physical reality; the relationship between the landholder and his land).
2. The absence of the concept of dominium in English law (English law; dominium; direct ownership of the land; proprietors; to own estates in land).
3. The only sound way to organize data for land information (the concept of an estate; to be of limited value to organize data by parcel; to own interests in land, proprietary estates; the physical location of the estates).
4. The concept of a hereditament (a single economic unit for real estate tax purposes; a single occupier; a single geographical unit; to comprise several parcels; a suitable building block for land information; to bring together; the concept of an estate; the physical reality on the ground).
5. Specificities of the geo-co-ordinates of the properties in the UK land administration system (government record; legal boundaries of properties; official geometric description of the property).
6. Tasks of the Ordnance Survey (the Ordnance Survey; to map; boundaries; features; to comprise; to require; to show boundaries; legal power; to fix private boundaries).

Text 2
Components of Planning Urban Areas

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: transportation, infrastructure, electricity, management, plan, region, situation, potential, investment, commerce, history, center, tourism, park, conservation;
b) прилагательные: urban, public, perfect, national;
c) глаголы: generate, create, regulate.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. The master plan of any urban region has the potential for guiding **growth**.
2. Preserving the history within a city creates a more livable space and can **boost tourism** in the area.
3. Open parks offer citizens an escape from the city's **hub** of activity.
4. One of the essential parts of any plan is the ability to provide citizens with an equal **opportunity**.
5. Communities cut offfrom **urban centers** have difficulty in accessing employment.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, расскажите о компонентах городского планирования.

Образец*: The desire for urban areas is public investment through taxes and fees*.

1. The desire for urban areas is… 2. Infrastructure includes…	a) lower-income housing projects b) preserving the history c) sewer, water, electricity, roads and floodwater management d) flow of transportation e) growing the city around major parks and recreation areas f) the ability to provide citizens with an equal opportunity

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **urban area** – городской район
2) **future growth** – будущий рост
3) **emergency situations** – чрезвычайные ситуации
4) **public investment** – государственные инвестиции
5) **taxes** – налоги
6) **fees** – сборы
7) **cornerstone** – краеугольный камень
8) **to boost tourism** – развивать туризм
9) **to create** – создавать
10) **wildlife sanctuaries** – заповедники
11) **to provide** – предоставлять, обеспечивать
12) **income level** – уровень дохода

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Components of Planning Urban Areas

The desire for urban areas is flow of transportation. Before any development can happen, there must first be an infrastructure suitable to the needs of future growth. Infrastructure includes sewer, water, electricity, roads and floodwater management. The master plan of any urban region has the potential for guiding growth in a way that will generate a fluid movement of people and commerce, especially in emergency situations.

Public investment through taxes and fees is the cornerstone for developing an infrastructure.

Most major urban centers have been around for a long time. Preserving the history and aesthetic of earlier developments within a city creates a more livable space and can boost tourism in the area.

Tourism and livability are also boosted by growing the city around major parks and recreation areas. Water, mountains and open parks offer citizens an escape from the city's hub of activity. Central Park in New York City is a perfect example. National parks and wildlife sanctuaries are perfect examples of preservation and conservation.

One of the essential parts of any plan is the ability to provide citizens with an equal opportunity. Communities cut off from urban centers by railroads, interstates or natural boundaries have difficulty in accessing employment. When planning for development and the use of land, special attention must be given to lower-income housing projects. Mixing housing for various income levels provides increased educational opportunities for lower income families.

To facilitate the implementation of a master plan, zoning ordinances and special regulations are imposed on real-estate developers.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

1) развитие	a) citizens
2) сохранять историю	b) the use of land
3) граждане	c) development
4) консервация	d) lower income families
5) равные возможности	e) educational opportunities
6) естественные границы	f) to preserve the history
7) использование земли	g) natural boundaries
8) семьи с низким доходом	h) conservation
9) образовательные возможности	i) equal opportunity

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1.Before any development can happen, there must first be …	a) growing the city around major parks and recreation areas.
2.Public investment through taxes and fees is …	b) the ability to provide citizens with an equal opportunity.
3.Tourism and livability are also boosted by …	c) perfect examples of preservation and conservation.
4.National parks and wildlife sanctuaries are …	d) an infrastructure suitable to the needs of future growth.
5.One of the essential parts of any plan is …	e) the cornerstone for developing an infrastructure.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The desire … urban areas is flow … transportation.
2. There must first be an infrastructure suitable … the needs … future growth.
3. Water, mountains and open parks offer citizens an escape … the city's hub … activity.
4. Preserving the history and aesthetic … earlier developments … a city creates a more livable space.
5. Mixing housing … various income levels provides increased educational opportunities … lower income families.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Infrastructure includes …
   a) sewer, water, electricity, roads and floodwater management; b) sewer, water, electricity and roads.
2. Public investment through taxes and fees is the cornerstone for …
   a) increased educational opportunities; b) developing an infrastructure.
3. One of the essential parts of any plan is the ability to provide citizens with…
   a) an equal opportunity; b) medical care.
4. When planning for development and the use of land, special attention must be given to …
   a) lower-income housing projects; b) parks and wildlife sanctuaries.
5. Communities cut off from urban centers have difficulty in accessing …
   a) proper education; b) employment.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Прежде всего, для развития городских районов необходима инфраструктура, подходящая для нужд будущего роста.
   (There must first be an infrastructure suitable to the needs of future growth).
2. Сохранение истории города может способствовать развитию туризма.
   (Preserving the history within a city can boost tourism in the area).
3. Одной из необходимых составляющих любого плана развития является возможность обеспечения граждан равными возможностями.
   (One of the essential parts of any plan is the ability to provide citizens with an equal opportunity).
4. Жители микрорайонов, отрезанных от городских центров, имеют сложности с трудоустройством.
   (Communities cut off from urban centers have difficulty in accessing employment).

5. Строительство жилья для граждан с разным уровнем доходов обеспечивает расширение образовательных возможностей для семей с низкими доходами.
   (Mixing housing for various income levels provides increased educational opportunities for lower income families).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Before any development can happen, there must first be an **i**… suitable to the needs of future growth. Infrastructure includes **s**…, **w**…, **e**…, r… and **f**… management. Preserving the **h**… within a city and its growing around major parks and recreation areas can boost **t**… in the area. One of the essential parts of any plan is the ability to provide citizens with an equal **o**… . Communities cut off from urban centers have difficulty in accessing **e**… . When planning for development and the use of land, special attention must be given to **l**…-**i**… housing projects. Mixing **h**… for various income levels provides increased **e**… **o**… for lower income families.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is the desire for urban areas? (flow of transportation)
2. What does urban infrastructure include? (sewer, water, electricity, roads and floodwater management)
3. What is the cornerstone for developing an infrastructure? (public investment through taxes and fees)
4. What can boost tourism in the urban area? (to preserve the history and aesthetic of earlier developments; to grow the city around major parks and recreation areas)
5. What is one of the essential parts of any plan? (to provide citizens with an equal opportunity)
6. What difficulty do communities cut off from urban centers have? (to have difficulty in accessing employment)
7. What does mixing housing for various income levels provide? (increased educational opportunities for lower income families)

ЗАДАНИЕ 13. Расскажите о городском планировании по следующему плану, используя слова, данные в скобках.

1. An infrastructure suitable to the needs of future growth (urban areas; development; an infrastructure; suitable; the needs of future growth; to include; sewer; water; electricity; roads; floodwater management).
2. Public investment (taxes and fees; the cornerstone for developing an infrastructure).

3. Boosting tourism (to preserve the history within a city; to boost tourism in the area; to grow the city; major parks and recreation areas).
4. An equal opportunity for citizens (the essential part of a plan; to provide citizens with an equal opportunity).
5. Difficulty for communities cut off from urban centers (communities cut off from urban centers; to have difficulty in accessing employment).
6. Lower-income housing projects (to give special attention to lower-income housing projects; mixing housing; various income levels; to provide; increased educational opportunities for lower income families).

Тексты для самостоятельной работы по теме «Urban Cadastre»

Text A

Прочитайте текст и выполните задание.

Types of Urban Planning

Various types of planning have emerged over the course of the 20th century. Below are the main typologies of planning, as defined by David Walters in his book, Designing Communities (2007):

- **Traditional or comprehensive planning**: common in the US after World War II, characterized by politically neutral experts with a rational view of the new urban development. Focused on producing clear statements about the form and content of new development.
- **Systems planning:** 1950s–1970s, resulting from the failure of comprehensive planning to deal with the unforeseen growth of post World War II America. More analytical view of the planning area as a set of complex processes, less interested in a physical plan.
- **Democratic planning:** 1960s. Result of societal loosening of class and race barriers. Gave more citizens a voice in planning for future of community.
- **Advocacy and equity planning:** 1960s and 70s. Strands of democratic planning that sought specifically to address social issues of inequality and injustice in community planning.
- **Strategic planning:** 1960s-present. Recognizes small-scale objectives and pragmatic real-world constraints.
- **Environmental planning:** 1960s-present. Developed as many of the ecological and social implications of global development were first widely understood.
- **Tenure responsive planning:** 2015-onwards. It recognizes that land use planning should be collaborative but with the purpose of tenure security improvement. This is a hybrid approach whereby traditional, advocacy, democratic and bottom-up efforts are merged in such a way that they focus towards tenure security outcomes.

Today, successful planning involves a balanced mix of analysis of the existing conditions and constraints; extensive public engagement; practical planning and design; and financially and politically feasible strategies for implementation. Current processes include a combination of strategic and environmental planning. It is becoming more widely understood that any sector of land has a certain capacity for supporting human, animal, and vegetative life in harmony, and that upsetting this balance has dire consequences on the environment.

Since the 1990s, the activist/environmentalist approach to planning has grown into the Smart Growth movement, characterized by the focus on more sustainable and less environmentally damaging forms of development. Smart growth supports the integration of mixed land uses into communities as a critical component of achieving better places to live.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Типы городского планирования».

Text B

Прочитайте текст и выполните задание.

Land Conservation Practices

Most conservation practices are put into place to decrease soil erosion. Erosion is the wearing way of soil and rock, and removal of top soil. Sheet and rill erosion occur on sloping land with little ground cover. Sheet erosion happens when water removes even layers of top soil. Rill erosion occurs when water makes channels up to 30 cm deep. Gully erosion happens when water makes a deep channel that washes away soil when it rains. The soil can wash into nearby creeks and streams causing disruption in quality and the flow of water. Wind can pick up and remove top soil if it is in a dry area not secured by plants or overgrazed.

Loss of top soil due to any of these situations has both short and long-term effects. The top soil is the most fertile part of the land with the most nutrients for growing crops, and it takes up to a thousand years to develop one inch of new topsoil.

Soil erosion is not the only concern when it comes to protecting and conserving land. Water quality protection, wildlife habitat preservation, recreational development/maintenance, nutrient and pest management are a few other factors that play a role in conserving land.During an evaluation of what conservation practice to implement, many factors and questions need to be considered.

There are two main categories that conservation practices can be divided into, operational and permanent. An operational conservation practice is a short-run practice that can be implemented on a year-by-year basis. The practice can be used one year and not the next. A permanent conservation practice is a long-run practice that will be in place once it is implemented until it is removed or altered. Some conservation practices may fall under both categories depending on the circumstance.

WRITING TASK

Напишите эссе на английском языке на тему «Деятельность по консервации земель».

Unit 4
Geodesy

Text 1
The Science of Geodesy

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на часть речи:

a) существительные: gravity, transportation, distances, model, ellipsoid, phenomena;
b) прилагательные: fundamental, geometric, global, national;
c) глаголы: coordinate, monitor, determine, adopt, base.

ЗАДАНИЕ 2. Прочитайте предложения и догадайтесь о значении выделенных слов.

1. Geodesy deals with accurately **measuring** geometric shape of the Earth.
2. With GPS geodesists can **monitor** the movement of a site.
3. In the past, geodesists **determined** the coordinates of points by using Earth-based surveying tools.
4. Geodynamical phenomena include crustal **motion**, tides, and polar **motion**.
5. Geodetic **infrastructure** provides significant **benefits** to society.

ЗАДАНИЕ 3. Используя образец и выражения, расскажите, что изучает геодезия.

Образец: *Geodesy studies Geodynamical phenomena.*

1. Geodesy studies … 2. Geodesy is a science about …	a) properties of the Earth b) geometric shapes c) gravity field d) orientation in space e) Earth's surface f) maps g) mathematical models

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **property** – свойство
2) **gravity field** – гравитационное поле
3) **to map** – составлять или чертить карту
4) **boundary** – граница
5) **to assign coordinates** – устанавливать координаты
6) **surveying tools** – измерительные инструменты
7) **point** – точка
8) **to capture** – захватывать
9) **mountain** – гора
10) **valley** – долина
11) **geoid** – геоид
12) **sea level** – уровень моря
13) **consistent manner** – последовательная работа
14) **National Spatial Reference System** – национальная пространственная система координат
15) **terrestrial** – наземный

ЗАДАНИЕ 5. Прочитайте и переведите текст.

The Science of Geodesy

Geodesy is the science of accurately measuring and understanding three fundamental properties of the Earth: its geometric shape, its orientation in space, and its gravity field. Geodesy also studies the changes of these properties with time. Geodesists measure where things are; where they have been and where they are going. By using GPS, geodesists can monitor the movement of a site 24 hours a day, seven days a week.

Many organizations use geodesy to map the shoreline, determine land boundaries, and improve transportation and navigation safety. To measure points on the Earth's surface, geodesists assign coordinates (similar to a unique address) to points all over the Earth. In the past, geodesists determined the coordinates of points by using Earth-based surveying tools to measure the distances between points. Today, geodesists use space-based tools like the Global Positioning System (GPS) to measure points on the Earth's surface.

To measure the Earth, geodesists build simple mathematical models of the Earth which capture the largest, most obvious features. Geodesists have adopted the ellipsoid as the most basic model of the Earth. Because the ellipsoid is based on a very simple mathematical model, it can be completely smooth and does not include any mountains or valleys. When additional detail of the Earth is needed, geodesists use the geoid. A geoid has a shape very similar to global mean sea level, but this exists over the whole globe, not just over the oceans.

Geodesists must accurately define the coordinates of points on the surface of the Earth in a consistent manner. A set of accurately measured points is the basis for the National Spatial Reference System, which allows different kinds of maps to be consistent with one another. Geodesists conduct measurements of Geodynamical phenomena. These include crustal motion, tides, and polar motion, which can be studied by designing global and national control networks, applying space and terrestrial techniques, and relying on datum and coordinate systems.

Geodetic infrastructure provides significant benefits to society by enabling an astonishing array of activities and innovations, including autonomous navigation, precision agriculture, civil surveying, early warning systems for hazards, and improved floodplain mapping.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

математические модели, система координат, береговая линия, улучшение транспортного сообщения, поверхность Земли, разные виды карт, движение земной коры, сети контроля, опираться на данные, преимущество для общества

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Geodesy studies …	a) includes autonomous navigation, precision agriculture, etc.
2. To measure points on the Earth's surface …	b) capture the largest, most obvious features.
3. Geodetic infrastructure …	c) allows different kinds of maps to be consistent with one another.
4. National Spatial Reference System …	d) geodesists assign coordinates.
5. Mathematical models of the Earth …	e) the changes properties of the Earth.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Geodesists measure three fundamental properties … the Earth.
2. Many organizations use geodesy … map the shoreline, determine land boundaries.
3. Geodesists assign coordinates … the Earth's surface.
4. The ellipsoid is based … a very simple mathematical model.
5. Crustal motion tides and polar motion can be studied … designing global and national control networks.
6. Earth surface can be studied relying … datum and coordinate systems.
7. Geodesists define the coordinates of points on the surface of the Earth … a consistent manner.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. By using GPS, geodesists can …
   a) replace the shoreline; b) monitor the movement of a site; c) change the properties of the site.
2. Today, geodesists use … to measure points on the Earth's surface.
   a) space-based tools; b) Earth-based tools; c) underwater tools.
3. Geodesists have adopted the … as the most basic model of the Earth.
   a) control networks; b)geoid; c) ellipsoid.
4. When additional detail of the Earth is needed, geodesists use the … .
   a) geoid; b) ellipsoid; c) navigation.
5. Geodesists must accurately define the … of points on the surface of the Earth.
   a) number; b) coordinates; c) size.

ЗАДАНИЕ 10. Подтвердите или опровергните словами из текста, что:

1. Благодаря технологии GPS возможно круглосуточное наблюдение за местностью.
2. В прошлом для измерения поверхности Земли использовались воздушная аппаратура.
3. Эллипсоид демонстрирует все рельефные особенности поверхности.
4. Геоид используется для более детального исследования поверхности.
5. Геодезические исследования связаны с системой охраны и предупреждения об опасности.

ЗАДАНИЕ 11. Ответьте на вопросы, используя слова, данные в скобках.

1. What does Geodesy study? (measuring; understanding; fundamental properties)
2. What are fundamental properties of Earth? (geometric shape; orientation in space; gravity field)
3. What is needed to measure points on the Earth's surface? (assign coordinates to points)
4. How is modern geodesy different from the geodesy in the past? (Earth-based surveying tools)
5. What tools are used to get basic model of the Earth? (the ellipsoid; the geoid)
6. How can National Spatial Reference System be used? (different kinds of maps; consistent)
7. What geodynamical phenomena are given in the text? (crustal motion;tides;polar motion)
8. Why is geodetic infrastructure beneficial for society? (astonishing array of activities and innovations).

ЗАДАНИЕ 12. Составьте рассказ о городской инфраструктуре по следующему плану, используя слова, данные в скобках.

1. Geodesy is the science of measuring the Earth (fundamental properties, measure, GPS).
2. Use geodetic data (shoreline, land boundaries, transportation, navigation).
3. Geodetic tools (ellipsoid, geoid, mathematical models, additional detail, whole globe).
4. The task of Geodesists (National Spatial Reference System, consistent, conduct measurements, Geodynamical phenomena).
5. Geodetic infrastructure and Society (benefits, autonomous navigation, precision agriculture, civil surveying, warning systems, hazards).

Text 2
The Difference between Geoid and Ellipsoid

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значение, обращая внимание на часть речи:

a) существительные: method, generalization, ellipsoid, geoid, University, photography, planet, system, sphere;
b) прилагательные: gravitational, potential, dynamic, global;
c) глаголы: construct, represent, calculate.

ЗАДАНИЕ 2. Прочитайте предложения и догадайтесь о значении выделенных слов:

1. GPS systems show the **differences** between locations on the earth.
2. The **height** of object is the distance between its upper and lower points.
3. Ellipsoid generally looks like a **circle**.
4. The forms of **shapes** of continents are observes better from space.
5. **Accurate** topographic data helps to make better maps.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, расскажите, как применяют геоид и эллипсоид.

Образец: *Geoid is used <u>in today's global positioning satellite systems.</u>*

1. Geoid is used …	a) to model the shape of the earth
2. Ellipsoid is necessary …	b) in GPS systems
	c) to measure location on Earth
	d) in topography
	e) to represent earth surface

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **although** – хотя
2) **to fail** – терпеть неудачу, зд. избегать
3) **trench** – каньон
4) **to complement** – дополнять
5) **according** – в соответствии с
6) **to assume** – предполагать
7) **equal** – равный
8) **to exclude** – исключать
9) **topographic elevation** – топографическая возвышенность
10) **aerial** – антенна
11) **smooth** – гладкий
12) **global positioning satellite system** – глобальная навигационная спутниковая система
13) **baseline** – основание
14) **measurement** – измерение, параметры
15) **mean** – средний

ЗАДАНИЕ 5. Прочитайте и переведите текст

The Difference between Geoid and Ellipsoid

Ellipsoids and geoids are methods used by topographers to model the shape of the earth. Although both model types are used to construct the Earth models, crucial differences exist. Ellipsoid models are more general in nature, and doesn`t take into account mountains and trenches. Ellipsoids and geoids are complemented by a third model type, topographic height.

Ellipsoid comes from the word "ellipse", which is simply a generalization of a circle. Ellipsoids are generalizations of spheres. Earth is not a true sphere, it is an ellipsoid, as Earth is slightly wider than it is tall. Although other models exist, the ellipsoid is the best fit to Earth's true shape.

Like the ellipsoid, the geoid is a model of the Earth's surface. According to the University of Oklahoma, "the geoid is a representation of the surface of the earth that it would assume, if the sea covered the earth." This representation is also called the "surface of equal gravitational potential," and essentially represents the "mean sea level". The geoid model is not an equal representation of sea level surface. Dynamic effects, such as waves and tides, are excluded in the geoid model.

Topographic elevation (also known as "topographic height") is a more accurate model of the earth than either the geoid or the ellipsoid. Topographers measure the Earth's height using either satellite or aerial photography. This model's elevation values are calculated relative to the average sea level in various places across the planet.

Unlike the geoid, the ellipsoid assumes that Earth's surface is smooth. Additionally, it represents the idea that the planet is completely homogeneous. If this were true, Earth could have no mountains or trenches. Further, the mean sea level would coincide with the ellipsoid surface.

The geoid and ellipsoid models are used in today's global positioning satellite (GPS) systems. GPS systems use the ellipsoid model as a baseline to measure the elevation of a particular location on Earth. However, some GPS systems now use the geoid model to better represent the elevations. Accurate measurements are most useful to topographers, whose job is it to develop as precise measurements of the Earth's surface as possible.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

уровень моря, однако, типы моделей, большая разница, топографическая возвышенность, эллипс, земная поверхность, волны, приливы, величины, в отличие от, единообразный, определенное местоположение, точные измерения (2 варианта).

ЗАДАНИЕ 7. Образуйте глаголы от следующих существительных и прилагательных, употребляемых в тексте:

difference, generalization, representation, elevation, positioning, location, measurements.

ЗАДАНИЕ 8. Соедините части предложений по смыслу.

1. Ellipsoids and geoids are used …	a) are excluded in the geoid model.
2. Ellipsoid …	b) to construct the Earth models.
3. Dynamic effects …	c) also known as "topographic height".
4. Topographic elevation …	d) is simply a generalization of a circle.
5. GPS systems …	e) use the ellipsoid model to measure the elevation.

ЗАДАНИЕ 9. Вставьте необходимые предлоги.

1. Ellipsoid models are more general … nature.
2. Earth is slightly wider … it is tall.
3. Ellipsoid comes … the word "ellipse".
4. Dynamic effects, such as waves and tides, are excluded … the geoid model.
5. This model's elevation values are calculated relative … the average sea level
6. The mean sea level would coincide … the ellipsoid surface.
7. The ellipsoid model is used to measure the elevation of a particular location … Earth.

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите (дополните) следующие предложения.

1. … models are more general in nature, and don`t take into account mountains and trenches.
   a) Ellipsoid; b) Geoid; c) Topographic elevation.
2. "Ellipse" is simply a generalization of a ….
   a) triangle; b) rectangle; c) circle.
3. …. represents the "mean sea level".
   a) Geoid; b) Ellipsoid; c) Earth`s height.
4. Topographers measure the Earth's height using either satellite or … .
   a) aerial photography; b) mapping; c) sea level.
5. The job of topographers is ….
   a) to develop precise measurements of the Earth's surface; b) to investigate seas and oceans; c) to develop new measuring systems.

ЗАДАНИЕ 11. Опровергните или подтвердите словами из текста, что:

1. Геоид и эллипсоид – разные модели формы Земли.
2. Земля имеет правильную сферическую форму.
3. Геоид – наиболее близкая к реальности модель Земли.
4. В модели геоида предполагается изображение динамических эффектов.
5. Существует третья, более точная модель Земли.
6. Вся поверхность планеты абсолютно единообразна.
7. Задача топографов – наиболее точно представить все параметры поверхности Земли.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What are three models to represent the Earth? (ellipsoid and geoid)
2. Is Earth a true sphere? (not)
3. How is the representation of the earth also called? (the geoid)
4. What is excluded in geoid model? (dynamic effects)
5. What do topographers use to measure the Earth`s height? (satellite; aerial photography)
6. Does the mean sea level coincide with the ellipsoid surface? (no)
7. What is modern application of geoid and ellipsoid? (GPS) systems)

ЗАДАНИЕ 13. Расскажите о трех моделях земной поверхности по следующему плану, используя слова, данные в скобках.

1. The main model types of the shape of the earth (model types, ellipsoid, geoid, topographic elevation, the shape of the earth).
2. What is ellipsoid (circle, Earth's true shape, generalizations, smooth).

3. What is geoid (sea, mean sea level, waves and tides).
4. What is topographic elevation (more accurate, satellite, aerial photography, average sea level).
5. Practical use of the earth models (GPS, better represent the elevations, accurate measurements).

Тексты для самостоятельной работы по теме «The Science of Geodesy»

Text A

Прочитайте текст и выполните задание.

Point Positioning: GPS

Point positioning is the determination of the coordinates of a point on land, at sea, or in space with respect to a coordinate system. Point position is solved by computation from measurements linking the known positions of terrestrial or extraterrestrial points with the unknown terrestrial position. This may involve transformations between or among astronomical and terrestrial coordinate systems. The known points used for point positioning can be triangulation points of a higher-order network or GPS satellites.

Nowadays all but special measurements (e.g., underground or high-precision engineering measurements) are performed with GPS.

GPS, which stands for Global Positioning System, is a radio navigation system that allows land, sea, and airborne users to determine their exact location, velocity, and time 24 hours a day anywhere in the world. The capabilities of today system render other well-known navigation and positioning technologies: the magnetic compass, the sextant, the chronometer, and radio-based devices impractical and obsolete. GPS is used to support a broad range of military, commercial, and consumer applications.

24 GPS satellites are in orbit at 10,600 miles above the earth. The satellites are spaced so that from any point on earth, four satellites will be above the horizon. Each satellite contains a computer, an atomic clock, and a radio. With an understanding of its own orbit and the clock, the satellite continually broadcasts its changing position and time. On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position – longitude and latitude – for most receivers, within a few meters.

If the receiver is also equipped with a display screen that shows a map, the position can be shown on the map. If you are moving, your receiver may also be able to calculate your speed and direction of travel and give you estimated times of arrival to specified destinations.

Some specialized GPS receivers can also store data for use in Geographic Information Systems (GIS) and map making.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Применение возможностей GPS для решения бытовых задач».

Text B

Прочитайте текст и выполните задание.

Geospatial Reference System

Knowing where you are, where things around you are and being able to navigate between them has always been important. Explorers navigated the seas in search of faraway lands and created detailed maps of the Earth using the sun and clocks to compute their position. Surveyors trekked through unchartered regions carrying heavy equipment to measure the highest peaks relative to sea level. Engineers met in the middle with incredible accuracy after tunneling through mountains, underground or underwater. It is all thanks to having an accurate and robust Geospatial Reference System.

A Geospatial Reference System is the collection of:

- **datum**, **reference frames** and **working surfaces**;
- **infrastructure**, including a national network of Global Navigation Satellite System Continuously Operating Reference Stations and survey marks to provide an authoritative and accurate network in support of positioning applications;
- **models** describing dynamic, geophysical processes that affect spatial measurements; and
- **standards** to ensure positioning information is Findable, Accessible, Interoperable and Reusable (e.g. ISO / OGC / Geodesy ML).

Like the foundations of a house, a Geospatial Reference System provides a stable, accurate and reliable frame on which accurate measurements can be made and connected together. One common type of frame are the graticule (grid) of lines of latitude and longitude on the Earth where the equator is our zero point (point of reference) for latitude and the Greenwich meridian is our zero point for longitude. This frame, providing zero points to which we refer positions, directions and measurements of the Earth, is priceless.

The importance of Geospatial Reference Systems was recognized by the United Nations in 2015 with the adoption of a General Assembly Resolution.

A Geospatial Reference System underpins the collection, management and alignment of spatial information and enables us to monitor the dynamic Earth as it breathes. In addition to the traditional survey, mapping and navigation fields, spatial information are increasingly critical for civil engineering, industrial automation,

agriculture, construction, mining, recreation, intelligent transport systems, land use planning and administration, construction and hazard assessment, disaster response and emergency management, environmental studies and scientific research. The Geospatial Reference System is the glue that allows us to align these spatial data to make better decisions.

WRITING TASK

Напишите эссе на английском языке о пространственной системе координат вашей родной местности, используя компоненты её структуры, упомянутые в тексте.

PART II
BUILDING MATERIALS

Building material is any material which is used for construction purposes. Many natural substances, such as clay, rocks, sand, and wood, even twigs and leaves, have been used to construct buildings. Apart from naturally occurring materials, many man-made products are in use, some more and some less synthetic. The manufacturing of building materials is an established industry in many countries. Building materials provide the make-up of habitats and structures.

All building materials are divided into three groups:

1. Main building materials such as rocks and artificial stones, timber and metals.
2. Binding materials such as lime, gypsum and cements.
3. Secondary or auxiliary materials which are used for the interior parts of the buildings.

We use main building materials for bearing structures, binding materials are used for making artificial stone and for joining different planes. We use secondary materials for the interior finish of the buildings.

1. What is building material?
2. What types of building materials are there?
3. What binding materials do you know?
4. Where are building materials used?

Unit 1
Modern Building Materials

Text 1
Modern Architectural Glass

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на часть речи*:*

a) существительные: prism, compression, component, column, material;
b) прилагательные: extreme, temperature, ecological, architectural, laminated;
c) глаголы: consist, construct, laminate.

ЗАДАНИЕ 2. Прочитайте предложения и догадайтесь о значении выделенных слов.

1. One of the most popular materials nowadays is **architectural** glass.
2. The **external** walls of a building are made of brick.
3. There are three **internal** walls in the house that divide it into separate rooms.
4. If a partition is **transparent**, you can clearly see through it.
5. In the North building materials should resist **extreme** temperatures.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, в каких строительных конструкциях применяется стекло.

Образец: *Glass is used in <u>all buildings</u>.*

1. Glass is used in … 2. The building materials made of glass are ….	a) glazing b) external walls c) windows d) internal partitions e) decorative elements f) partitions g) columns and beams

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **building envelope** – ограждающая конструкция здания
2) **glazing** – застекление
3) **transparent** – прозрачный
4) **reinforced** – армированный, укрепленный
5) **toughened glass** – высокопрочное, закаленное стекло
6) **silica** – кремнезем, кварц
7) **soda ash** – кальцинированная сода
8) **lime** – известь
9) **blowing** – дутье
10) **durability** – долговечность, прочность
11) **mold** – литейная форма
12) **available** – доступный
13) **fragility** – хрупкость
14) **brittleness** – хрупкость, ломкость
15) **cast class** – литое стекло
16) **heat-strengthened** – термоупрочненное
17) **solidify** – затвердевать

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Modern Architectural Glass

Architectural glass is glass that is used as a building material. It is most typically used for transparent glazing in the building envelope, including windows in the external walls. Glass is also used for internal partitions and as an architectural feature. In buildings glass of a safety type is used, which includes reinforced, toughened and laminated glasses.

Glass was discovered in ancient areas of Persia and Egypt. Production of glass in modern times has not changed much. It is made of sand (which consists of silica, soda ash and lime), which is heated to extreme temperatures. Then it is cooled down and shaped into almost any form by blowing or pouring in pre-designed molds. If you use additives you can provide glass with any colour or opacity, improve its quality, durability and other properties.

Glass has both advantages and disadvantages. Its main advantage is strength and transparency. Also, it is ecologically clean and available building material. The disadvantage of glass is its fragility and brittleness.

There are many different kinds of architectural glass: cast glass, prism glass, laminated glass, heat-strengthened glass, self-cleaning glass, etc. Cast glass is made by directing molten glass into a mould where it solidifies. Prism glass is architectural glass which bends light. It is used for sidewalks, in windows and partitions. Laminated glass consists of two or more layers of glass. The layers prevent it from breaking apart. Heat-strengthened glass induces surface compression. Self-cleaning glass destroys and washes away any organic compounds on the window surface.

Transparent buildings and structures are very popular in contemporary architecture. Structural glass components such as columns and beams are often required, but this material seems structurally unsafe because of its brittleness. For this reason a new construction technique has been developed. It uses very long overlapping glass segments to create glass beams. These are made by bonding the segments adhesively. Also, a small stainless steel profile can be added to the layout of the glass beam to reinforce it.

Glass is widely used not only in construction, but in many other spheres of life: IT technology, medicine, decoration, chemistry, communication and many others.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

a) sidewalk	1) самоочищающееся стекло
b) layers of glass	2) разбивать
c) break apart	3) смывать, очищать
d) self-cleaning class	4) современная архитектура
e) wash away	5) органические соединения
f) organic compounds	6) стеклянные листы, расположенные внахлест
g) contemporary architecture	7) пешеходная дорожка
h) overlapping glass	8) слои стекла

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Glass was discovered …	a) can provide glass with any colour or opacity.
2. Additives …	b) its fragility and brittleness.
3. The advantages of glass are…	c) small stainless steel profile can be added to it.
4. The disadvantages of glass are …	d) in ancient areas of Persia and Egypt.
5. To reinforce glass …	e) strength and transparency.

ЗАДАНИЕ 8. Вставьте необходимый предлог.

1. Glass is most typically used … transparent glazing.
2. Glass is made … sand, which is heated to extreme temperatures.
3. Cast glass is made … directing molten glass into a mould.
4. There are many different kinds … architectural class
5. Lamination prevents glass … breaking apart.
6. Glass columns and beams seem structurally unsafe because … its brittleness.
7. Glass is widely used … construction for many centuries.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Glass is used for internal partitions and as an architectural … .
   a) façade; b) feature; c) future.
2. The basic ingredient of glass – sand - consists of silica, soda ash and … .
   a) lime; b) stone; c) cement.
3. … is made by directing molten glass into a mould.
   a) heat-strengthened glass; b) prism glass; c) cast glass.
4. … class destroys and washes away any organic compounds on the window surface.
   a) Self-cleaning; b) Laminated glass; c) Prism glass.
5. A small … profile can be added to reinforce the glass beam.
   a) brick; b) stainless steel; c) lime.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Стекло применяют как для внутренних, так и для внешних строительных элементов здания.
2. Принцип производства стекла не изменился с древних времен.
3. Стекло имеет как преимущества, так и недостатки.
4. Существует несколько видов стекла.
5. Стекло применяют в разных сферах жизни.

ЗАДАНИЕ 11. Прочитайте текст, вставляя пропущенные слова, которые соответствуют тексту.

A … glass is a modern building material. Glass is used for **w**… and external **w**… . The main ingredient of glass is **s**… . It is heated, cooled **d** … and poured in pre-designed **m**… . Laminated glass c… of two or more layers of glass. **P**… glass is architectural glass which bends light.

A new construction **t**… has been developed to make glass columns and beams structurally safer. Glass is widely used not only in **c**… .

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. How is architectural glass used? (transparent glazing; building envelope; windows external walls)
2. What are safety types of architectural glass? (reinforced; toughened; laminated)
3. Where was glass first discovered? (Persia and Egypt)
4. How is glass made? (sand, heated to extreme temperatures; cooled down; shaped; molds)
5. What are advantages and disadvantages of glass? (strength; transparency; ecologically clean; available; fragility; brittleness)
6. What are the main types of glass? (cast class; prism glass; laminated glass; heat-strengthened glass; self-cleaning class)
7. How are glass structures reinforced? (new construction technique; overlapping glass segments; glass beams; bond the segments adhesively; stainless steel profile)
8. Where is glass used? (construction; IT technology; medicine; decoration; chemistry; communication, etc.).

ЗАДАНИЕ 13. Расскажите об архитектурно-строительном стекле по следующему плану, используя слова, данные в скобках.

1. Building elements made of glass (building material, transparent glazing in the building envelope, internal partitions, architectural feature).
2. Production of glass (sand, heated, extreme temperatures, cooled down, shaped, blown, molds, additives).
3. Properties of glass (strength, transparency, ecologically clean, available, fragility, brittleness).
4. Different types of glass (cast class, prism glass, laminated glass, heat-strengthened glass, self-cleaning class)
5. Application of architectural glass (construction, IT technology, medicine, decoration, chemistry, communication).

Text 2
Advanced Building Materials
Making New Construction More Sustainable

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: problems, architects, material(s), technology, results, facades, standard, bacteria, energy, panels, electricity, communication, device, production, tornado;
b) прилагательные: normal, perpendicular, non-toxic, electronic, ultra violet;
c) глаголы: combine, react.

ЗАДАНИЕ 2. Догадайтесь о значении выделенных слов в предложении.

1. Children believe in **miracles**.
2. Rivers in big cities are **polluted**.
3. The pie has three **layers.**
4. We **purify** the water at home by filtering it.
5. Stone is a **versatile** building material.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, какие современные материалы используют строители и архитекторы.

Образец: *Modern constructors use <u>cross laminated timber</u> in building structures.*

1. Modern constructors use …	a) cross laminated timber in building structures. b) Kebony in building structures.
2. Modern architects use …	c) titanium dioxides in building structures. d) graphene in building structures. e) impact resistant glass in building structures.

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **sustainable, a –** надежный и эффективный
2) **alterations, n –** модификации
3) **cross laminated timber** – перекрестно склеенная древесина, многослойные клееные деревянные панели
4) **cross direction –** поперечное направление

5) **knotty timber –** сучковатая древесина
6) **grain, n –** волокно
7) **beams, n** – ламели
8) **ebony, n –** черное, эбеновое дерево
9) **bio-waste liquid** – жидкие биоотходы
10) **titanium dioxide –** диоксид титана, двуокись титана
11) **prefinished facades of the buildings –** готовые**,** промышленным способом изготовленные фасады зданий
12) **supplement, v** – дополнять
13) **graphene, n –** графен
14) **graphite, n –** графит
15) **PV panels (solar photo voltaic panels) –** солнечные батареи
16) **electronic paper –** электронная бумага
17) **communication devices –** устройства связи
18) **impact resistant glass –** ударопрочное стекло
19) **advancement, n –** достижение
20) **major, a –** масштабный
21) **groundbreaking, a –** инновационные

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Advanced Building Materials
Making New Construction More Sustainable

Every city, big or small, faces the problems with contemporary buildings and environmental issues. Constructors and architects have to search for new materials, and here are some of the most sustainable and advanced building materials found.

CLT (Cross Laminated Timber) and Kebony

Today's technology has worked miracles on wood alterations. They have found several ways of making wood hard and strong enough to be considered as part of the emerging advanced building materials used in construction activities. The results of researches are CLT and Kebony. CLT is a lightweight and extremely strong material. Unlike normal wood, it is strong both in grain and cross direction, because of its perpendicular layers. In addition, since it relies on layers of smaller beams, it reduces waste by using knotty timber that mills usually reject. Kebony is another developed type of wood, which is more durable and stronger than ebony and it is eco-friendly and non-toxic. This green wood is made in a process of combining sustainable softwood, bio-waste liquid and heat.

Titanium Dioxide

Since lots of cities are polluted with exhaust fumes and dirt in the air, we need something in our buildings to purify that air and create a much more pleasant environment. Titanium dioxide is a simple addition we can make to all the prefinished facades of the buildings. If only a nano-coating of titanium dioxideis

applied on the outer skin of the building, it will pull the dirt, grease and bacteria out of the air, thus purify it. Titanium dioxide reacts to sunlight that acts on it during the day, and supplementing it by ultra violet light at night. Those UV lights can be easily powered by energy collected through PV panels, and could serve as lights that will glow during the night.

Graphene

It is a new material that is made from graphite and it is famous for being super thin and strong and an amazing conductor of electricity and heat. It is one of the most versatile materials that could be used in building nearly anything. Scientists believe it could improve solar energy and allow creation and operation of solar panels at lower costs. In addition, because of its thinness and flexibility, it could be used for electronic paper and communication devices that could bend. However, the main aim is incorporating it into building structures, which can lead to a better and healthier environment and lower costs.

Impact Resistant Glass

The advancement in glass production has led us to the development of impact resistant glass. This strong glass is typically used in homes that are located in hurricane or tornado zones, and it eliminates the potential of injuries caused by glass debris damaged in major weather events. Not only this glass makes homes safe, but encourages larger windows and using less concrete and other building materials, thus preserving the environment and lowering the bills of homeowners.

We are responsible for the world we are making, so we should do our best to use the advanced technology and science for making some groundbreaking sustainable advanced building materials.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) новейшие строительные материалы	a) in grain and cross direction
2) домовладельцы	b) an amazing conductor of electricity
3) по направлению волокна и в противоположном направлении	c) a nano-coating
4) сокращает отходы	d) homeowners
5) простая добавка	e) hurricane
6) нанопокрытие	f) advanced building materials
7) внешняя поверхность здания	g) reduces waste
8) прекрасный проводник электричества	h) major weather events
9) ураган	i) the outer skin of the building
10) масштабные погодные катаклизмы	j) a simple addition

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Unlike normal wood CLT is …	a) that could bend.
2. Kebony is another developed type of wood, …	b) that mills usually reject.
3. If titanium dioxide is applied on the outer skin of the building, …	c) it is eco-friendly and non-toxic.
4. CLT reduces waste by using knotty timber …	d) strong both in grain and cross direction.
5. Graphene could be used for electronic paper …	e) it will pull the dirt, grease, and bacteria out of the air.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The advancement in glass production has led us … the development of impact resistant glass.
2. Impact resistant glassis used … homes that are located … hurricane or tornado zones.
3. CLT relies … layers of smaller beams.
4. Kebony is a developed type … wood.
5. Graphene is a new material that is made … graphite.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите предложения.

1. Unlike normal wood, CLT is strong both in grain and cross direction, because of …
   a) its longitudinal layers; b) its perpendicular layers.
2. Kebony is made in a process of combining sustainable softwood, …
   a) bio-waste liquid and heat; b) graphite and a nano-coating of titanium dioxide.
3. At night titanium dioxide reacts to …
   a) sunlight; b) ultra violet light.
4. Graphene could be used for electronic paper and communication devices because of …
   a) lightweight and versatility; b) thinness and flexibility.
5. Impact resistant glass is typically used in homes because it eliminates …
   a) the potential of injuries; b) the dirt, grease and bacteria.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Были найдены способы причислить древесину к новейшим строительным материалам.
   (They have found several ways of making wood hard and strong enough to be considered as part of the emerging advanced building materials.)

2. Использование перекрестно склеенной древесины позволяет экономить материал.
   (Since CLT relies on layers of smaller beams, it reduces waste by using knotty timber that mills usually reject.)
3. Кебони обладает рядом ценных свойств.
   (Kebony is another developed type of wood, which is more durable and stronger than ebony and it is eco-friendly and non-toxic.)
4. Двуокись титана – это простая добавка, которая используется при производстве готовых фасадов зданий.
   (Titanium dioxide is a simple addition we can make to all the prefinished facades of the buildings.)
5. Технологии применения ударопрочного стекла в строительстве вносят вклад в дело защиты окружающей среды.
   (Impact resistant glass encourages larger windows and allows using less concrete and other building materials, thus preserving the environment.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Today's technology has produced some emerging advanced building **m**... . CTL is lightweight and extremely **s**… . Kebony is more **d**… and stronger than ebony and it is eco-**f**… and non-toxic. They are wood **a**… . Titanium dioxide pulls the dirt, grease and **b**… out of the **a**… and purifies it. Graphene is one of the most **v**… materials that could be used in **b** … nearly anything. Impact resistant glass eliminates the **p**… of injuries caused by glass debris damaged in major **w**… events.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Can wood be considered as part of the emerging advanced building materials? (today's technology; on wood alterations; ways of making wood hard and strong; the results of researches are CLT and Kebony)
2. What is special about CLT? (lightweight; extremely strong material; unlike normal wood; strong both in grain and cross direction; it relies on layers of smaller beams;, it reduces waste by using knotty timber)
3. Which properties does Kebony have? (more durable; stronger than ebony; eco-friendly; non-toxic)
4. Does titanium dioxide fulfill an important function in a city or town? Which one? (a nano-coating of titanium dioxide; on the outer skin of the building, pull the dirt, grease and bacteria; out of the air; purify)
5. How does titanium dioxide work during the day and at night? (reacts to sunlight that acts on it; during the day; ultra violet light; at night; UV lights; powered by energy; PV panels)

6. What is graphene can be used for and why? (super thin; strong; amazing conductor of electricity and heat; versatile; could be used in building nearly anything; improve solar energy; creation and operation of solar panels at lower costs; thinness and flexibility; electronic paper; communication devices; bend)
7. Why is impact resistant glass typically used in homes that are located in hurricane or tornado zones? (strong; eliminates the potential of injuries; glass debris; damaged; major weather events)

ЗАДАНИЕ 13. Расскажите о новейших строительных материалах по плану, используя слова, данные в скобках.

1. The main characteristics of cross laminated timber (lightweight; extremely strong; unlike normal wood, strong both in grain and cross direction, reduces waste; knotty timber; mills reject).
2. The composition and properties of Kebony (combining; softwood; bio-waste liquid; heat; more durable and stronger than ebony; eco-friendly; non-toxic).
3. Titanium dioxide purifies air and creates a much more pleasant environment (polluted; exhaust fumes; dirt in the air, purify; a simple addition; prefinished facades; a nano-coating of titanium dioxide; pull the dirt, grease and bacteria).
4. Graphene is a versatile material (super thin; strong; an amazing conductor of electricity and heat; could be used in building nearly anything; could improve solar energy; allow creation and operation of solar panels at lower costs; thinness and flexibility; electronic paper; communication devices; could bend; incorporating it into building structures; better and healthier environment; lower costs).
5. Impact resistant glass protects health and environment (strong glass; homes; located; hurricane or tornado zones; eliminates; the potential of injuries; glass debris; major weather events; larger windows; less concrete and other building materials, preserving the environment).

Тексты для самостоятельной работы по теме «Modern Building Materials»

Text A

Прочитайте текст и выполните задание.

Transparent Wood

Wood is widely used in architecture today for a number of reasons. In many ways, wood is a preferable material compared to glass and plastic. Wood has lower thermal conductivity which helps to keep a building at more consistent temperature. Wood also has good mechanical properties, such as strength, toughness and low density, which makes it even more attractive replacement for glass.

Transparent wood isa transparent glass-like wood you can see through. It was introduced in 2016 by two research groups, from the University of Maryland and the KTH Royal Institute of Technology.

The process of production of transparent wood consists of three basic steps. The first step consists of immersing the 4 or 5 inch block of wood in a solution of water, sodium hydroxide, and sodium sulfite at boiling temperature for two hours. The second step of oxidation with hydrogen peroxide completes the leaching of the lignin. The third step consists of immersing the material in epoxy and putting it under alternating vacuum and atmospheric pressure.

The potential of transparent wood is not only in construction; it can also transform electronics. For example, it could be used to manufacture solar cells. It is a low-cost, readily available and renewable material and can be a potential solution for building solar panels, especially for large surfaces.

Transparent wood can create completely new markets for wood industry, and its applications replace materials used in several fields. Best of all, it can mean that we can have bio-based alternatives for current materials created from non-renewable sources. Both research teams believe, we don't need to wait long before the rapid success of this great material will begin.

WRITING TASK

Напишите эссе на английском языке на тему "Application of Transparent Wood".

Text B

Прочитайте текст и выполните задание.

The Latest Modern Construction Materials

The much awaited and anticipated revolution in construction is gaining momentum. We now have drones, virtual reality, augmented reality, BIM, project management, etc. Researchers are taking technology to the next level. Let us have a look at some innovative construction materials that could revolutionize the building sector:

Hydroceramics

Due to the combination of clay and hydrogel a new material that has a cooling effect on building interiors was created. Hydroceramics has the ability to reduce the indoor temperature by up to 6 degrees Celsius. Its cooling effect comes from the presence of hydrogel in its structure, which absorbs water. The absorbed water is released to reduce the temperature during hot days.

Incorporating an innovative cooling system in the current building structure has made hydroceramics into one of the coolest building materials to revolutionize construction. More progress in this direction can make household air conditioners obsolete and add one more element on the list of the materials that are needed for building a house.

Light generating cement

It is produced using the process ofpolycondensationof raw materials such as river sand, industrial waste, silica, water, and alkali. The process is done at room temperature, so the energy usage is low.

The potential uses and application of cement that has the ability to absorb and irradiate light can be huge. The construction industry is evolving and one of the main trends is the move towards a more resource and energy efficient way of creating structures. Therefore, the applications of cement acting as a 'light bulb' are very broad. We can use them in swimming pools, parking lots, road safety signs, and others.

Bendable concrete

With the help of interlocking fibers this innovative material, actually flexes to absorb pressure, changes in temperature, and movement.The concrete is technically a composite because it mixes special fibers with regular concrete. The fibers account for some of the flexibility and strength because they distribute weight evenly throughout the slab. They also flex when meet with a lot of pressure. The fibers move their position slightly to accommodate the added weight.

Even before this new kind of concrete is widely implemented, it is compatible with today's roads. Bendable concrete can be used as patching material for existing potholes or cracks. Since it is a relatively recent development, there is still much research and further improvement necessary before it is accepted as a feasible alternative to traditional pavement.

WRITING TASK

Подготовьте презентацию на английском языке на тему "Applications of the Advanced Building Materials in Modern Construction".

PART III
ARCHITECTURE, RESTORING AND TOWN PLANNING

Architecture is the art and science of designing and building structures or ensembles according to aesthetic and functional criteria.When the architect designs a structure, he uses the knowledge of centuries.

Design may be considered as the architectural concept of a building represented by plans, elevations and drawings.

The conservation and restoration is a process of protection and care of artworks, architecture, archaeology and museum collection, i.e. cultural heritage. Building restoration is an attempt to return it to a previous state.

City planning is planning a future community in an organized manner and with an organized layout, taking into account such aspects as environmental conditions, social requirements, recreational facilities, esthetic design and other factors.

1. What principles should be followed by an architect?
2. In what form do designers usually perform the concept of a building?
3. What are the restorer's functions?
4. What does urbanism should take into account?

Unit 1
Architecture

Text 1
Architecture and Sphere of its Influence

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: architect, person, conductor, art, process, design, structure, triumph, ceremony, result, criteria, profession, furniture, form, method;
b) прилагательные: technical, democratic, aesthetic, functional, human;
c) глаголы: design, form, administrate, process.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. A famous American architect Frank Lloyd Wright (in 1930) **emphasized** that architecture is the scientific art.
2. No concepts and ideas could be possible without a person who **implements** them.
3. Architects may be described as conductors who **take the lead** in administrating all the goals for building.
4. Architecture inspires us, helps us do our jobsand **brings us together.**
5. Technical knowledge creates spaces that are **safe**, **efficient** and **sustainable**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, что должен использовать архитектор в своей работе.

Образец: *Architects design buildings through the use of creative vision.*

1. Architects design buildings through the use of … 2. Architects create spaces using…	a) artistic imagination b) practical and technical knowledge c) interpersonal skills d) psychological understanding e) ethical practice f) rules of insolation g) climatic conditions of the area

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **to fulfill** – реализовывать
2) **to describe** – описывать
3) **to implement** – воплощать
4) **to take the lead** – стать во главе
5) **an ingredient part** – неотъемлемая часть
6) **indoors/outdoors** – внутри/снаружи
7) **artificial light** – искусственное освещение
8) **furniture** – мебель
9) **well-being** – благосостояние
10) **tool** – инструмент
11) **to influence, to affect** – влиять, воздействовать.

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Architecture and Sphere of its Influence

What is architecture? The word “architecture” can have many meanings. Architecture can be an art and a science, a process and a result. Dictionary of Architecture and Construction by Cyril M. Harris (ed. in 2006) says that architecture is the art and science of designing and building structures or openareas in keeping with aesthetic and functional criteria, or structures built in accordance withsuch principles. A famous American architect Frank Lloyd Wright (in 1930) emphasized that architecture is the scientific art of making structure express ideas and it’s the triumph of human imagination over materials, method, and men. In 2011 Barack Obama, American President, claimed in his Pritzker Architecture Prize Ceremony Speech that architecture can be considered the most democratic of art forms because it ‘is about creating buildings and spaces that inspire us, that help us do our jobs, that bring us together’.

But no concepts and ideas could be possible without a person who implements them. So an architect is an ingredient part of architecture, he plans, designs and controls the construction of buildings.

Architects may be described as conductors who take the lead in administrating all the goals for building any structure. Architects do it through the use of the following constituent elements of this process:

- ✓ artistic imagination and creative vision to design spaces where their ideas and techniques are represented through form, light, textures, materials, and colours to fulfill our aesthetic, spiritual, and cultural needs;
- ✓ practical and technical knowledge to create spaces that are safe, efficient, sustainable, and meet economic needs;
- ✓ interpersonal skills, psychological understanding and ethical practice to craft spaces that fulfill the complex, and sometimes conflicting, needs of clients.

According to different international organizations the number of architects around the globe could be estimated as somewhere between three and four million.

Architecture affects our lives and personality. As W. Churchill in 1943 assumed "We shape our buildings and afterwards our buildings shape us".

No matter where one spends mostof their lives – indoors or outdoors, - we are always surrounded by forms, shapes artificial light, colors, furniture and so on. So buildings and cities affect our mood health and well-being.

To conclude we assert that architecture as profession is a very powerful tool that transforms the quality of the environment around us and deeply influences our lives.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) планирует, проектирует и контролирует строительство здания	a) transforms the quality of the environment around us
2) реализовать сложные потребности клиентов	b) affect our mood, health and well-being
3) искусство заставить здание воплотить идею	c) fulfill the complex needs of clients
4) в соответствии с эстетическими и функциональными критериями	d) take the lead in administrating the goals for building any structure
5) меняет качество нашего окружения	e) plans, designs and controls the construction of buildings
6) влиять на настроение, здоровье, благосостояние	f) the art of making structure express ideas
7) занимает ведущее положение в управлении процессами при строительстве сооружений	g) in keeping with aesthetic and functional criteria

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Architects may be described as conductors who …	a) the quality of the environment around us.
2. According to different international organizations the number of architects around the globe could …	b) take the lead in administrating all the goals for building any structure.
3. We are always surrounded by….	c) human imagination over materials, method, and men.
4. Architecture as profession is a very powerful tool that transforms …	d) be estimated as somewhere between three and four million.
5. Architecture's the triumph of …	e) forms, shapes, artificial light, colors, furniture

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Architecture is the scientific art …. making structure express ideas.
2. We are always surrounded …… forms, shapes, artificial light and colors.
3. The number … architects … the globe could be estimated as somewhere … three and four million.
4. Architecture is the art and science …. designing and building structures or openareas ….. aesthetic and functional criteria.
5. No concepts and ideas could be possible …. a person who implements them.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. The word architecture can have …
   a) one determined meaning; b) many meanings.
2. Architecture is the art and science of designing and building structures in keeping with …
   a) aesthetic and functional criteria; b) some philosophical principles.
3. Architects may be described as conductors who take the lead in administrating …
   a) quite determined list of aims; b) all the goals for building.
4. Barack Obama, American President, claimed in his Pritzker Architecture Prize Ceremony Speech that architecture can be considered …
   a) one of arts for democrats; b) the most democratic of art forms.
5. According to different international organizations the number of architects around the globe could be estimated …
   a) between three and four million; b) between two and three million.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Где бы мы ни находились, мы всегда окружены формами, пространством, светом, мебелью и т.д.
2. Для того чтобы спроектировать безопасное, экологичное и экономически выгодное пространство, необходимо обладать практическими навыками и техническими знаниями.
3. Архитектура как профессия – это очень мощный инструмент, который качественно меняет пространство вокруг нас.
4. Никакие идеи невозможно воплотить, если не будет человека, который знает, как это сделать.
5. Здания и города влияют на наше здоровье, настроение и благосостояние.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

The word **a**... can have many **m**… . Architecture can be both an **a**… and a **s**…, a **p**… and a **r**… Dictionary of **A**... and **C**... by Cyril M. Harris says that architecture is the art and science of d… and b… structures or open a… in keeping with **a**… and **f**… criteria, or **s**… built in accordance with such **p**… . A famous American architect Frank **L**… **W**… emphasized that architecture is the scientific art of making structure express **i**… and it's the triumph of **h**… imagination over **m**…, method, and men.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is architecture according to the dictionaries? (the art and science of designing and building structures; aesthetic and functional criteria)
2. What definition of architecture was given by Frank Lloyd Wright? (scientific art of making structure express ideas; the triumph of human imagination)
3. What did Barack Obama claim as far as architecture concerns in his Pritzker Architecture Prize Ceremony Speech? (the most democratic of art forms)
4. What is architect? (conductors; take the lead in administrating construction)
5. What are the constituent elements of architecture? (artistic imagination and creative vision; practical and technical knowledge; psychological understanding and ethical practice)
6. What is the number of architects around the globe? (somewhere between three and four million)
7. What does architecture affect? (transforms the quality of the environment)

ЗАДАНИЕ 13. Расскажите о влиянии архитектуры на жизнь современного человека по следующему плану, используя слова, данные в скобках.

1. What is architecture? (many meanings;a process and a result; aesthetic and functional criteria; Frank Lloyd Wright; art of making structure express ideas; Barack Obama; the most democratic of art forms)
2. What is an architect? (a person, implements, plans, designs, controls, construction of buildings, take the lead, administrating, goals)
3. Constituent elements of designing a structure (artistic imagination, creative vision, to design spaces, through form, light, textures, materials, colours, to fulfill needs, practical and technical knowledge; safe, efficient, sustainable spaces; interpersonal skills; psychological understanding, ethical practice, to craft spaces)
4. Number of architects around the globe (international organizations, between three and four million)
5. Architecture affects our lives and personality. (W. Churchill, shape our buildings, our buildings shape us,spend most of their lives, indoors or outdoors,surrounded by forms, shapes, artificial light, colors, furniture, buildings, cities, affect, mood, health, well-being)
6. Conclusion (architecture, profession, powerful tool, transform the quality of the environment, influences our lives).

Text 2
Architectural Education in Russia

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: model, exam, subject, diploma, project, experimentation, history, specialist, faculty, sculpture, plan;
b) прилагательные: ambitious, international, present, public, academic, industrial;
c) глаголы: model, subject, project, present, plan.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. In some other Russian cities we also may find **renowned** institutions that train specialists.
2. The unique **approach** to education and **self-development** in Britanka have secured its status as a place of **free thinking** and ambitious experimentation.
3. The **educational process** is completely in English there.
4. Study of architecture in Russia has **successive stages**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, где могут обучаться дизайнеры, архитекторы и реставраторы.

Образец: *Architects, restorers and designers are trained <u>at many engineering institutes</u>.*

1. Architects, restorers and designers are trained at …	a) architectural faculties b) at some special architectural and artistic institutes c) Moscow Architectural Institute d) Voronezh State Technical University e) Moscow School of Painting, Sculpture and Architecture f) The British Higher School of Art and Design g) Saint-Petersburg State University of Architecture and Civil Engineering
2. … train(s) specialists in different architectural fields.	

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **to take exams** – сдавать экзамены
2) **along-standing history** – проверенная временем история
3) **to enable** – давать возможность, позволять
4) **self-development** – саморазвитие
5) **renowned institutions** – знаменитые, прославленные учреждения
6) **thesis** – диссертация
7) **a diploma** – диплом
8) **free thinking** – свободомыслие
9) **a well-respected University** – престижный университет
10) **a unique approach** – уникальный подход
11) **core subjects** – ключевые предметы
12) **an academic year** – учебный год
13) **old-established universities** – давно существующие университеты

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Architectural Education in Russia

In Russia architects are trained at many engineering institutes which have architectural faculties and at some special architectural and artistic institutes.

The most famous universities are located in Moscow and Saint-Petersburg. They are Moscow Architectural Institute (State Academy) [1], Moscow School of Painting, Sculpture and Architecture[2], Saint-Petersburg State University of Architecture and

Civil Engineering[3], etc. These are the most ancient architectural educational institutions in our country. But in some other Russian cities we also may find renowned institutions that train specialists in such fields as Town-Planning, Architecture of Residential and Public Buildings, Architectural Design, Architecture of Industrial Buildings, Theory and History of Architecture, Restoration of Architectural Monuments, Interior Architecture, Landscaping and so on. Such universities exist for instance in Yekaterinburg, Novosibirsk, Tomsk and Voronezh.

Voronezh Architectural Institute has a long-standing history; it was established in 1930, now it has become a part of a well-respected Voronezh State Technical University. The academic year lasts from September to July consisting of two terms or semesters. At the end of each term or trimester students have to take exams.

Simultaneously with celebratedold-established universities at present some new forward-looking and very prestigious architectural schools are being opened. For example, Strelka Institute for Media, Architecture and Design or The British Higher School of Art and Design. Strelka Institute is an international educational project, founded in 2009 and located in Moscow and supported by foreign architects, e.g. Rem Koolhaas. The Institute aims to educate the next generation of architects, designers and media professionals, enabling them to shape the 21st century world. The British Higher School of Art and Design, known as Britanka, was founded in 2003.The unique approach to education and self-development in the course of 17 years in Britanka have secured its status as a place of creativity, free thinking and ambitious experimentation. The educational process is completely in English there.

Generally speaking, study of architecture in Russia is built according to the Western model, and has successive stages: Bachelor's degree, Master's degree, Post-graduate Course. To get a diploma, students pass the exams in core subjects and write a thesis or defend architectural project.

[1]Московский Архитектурный Институт (Государственная Академия) – МархИ
[2]Московское училище живописи, ваяния и зодчества
[3]Санкт-Петербургский государственный архитектурно-строительный университет.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) давно существующие университеты	a) a long-standing history
2) учебный год	b) to take exams
3) престижный университет	c) renowned institutions
4) знаменитые, прославленные учреждения	d) core subjects
5) саморазвитие	e) old-established universities
6) ключевые предметы	f) self-development
7) проверенная временем история	g) academic year
8) сдавать экзамены	h) a well-respected University

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Voronezh Architectural Institute …	a) the Western model, and has successive stages.
2. Simultaneously with celebrated old-established universities at present …	b) in Britanka have secured its status as a place of creativity.
3. Study of architecture in Russia is built according to …	c) some new forward-looking and very prestigious architectural schools are being opened.
4. The unique approach to education and self-development in the course of 15 years …	d) consisting of two terms or semesters.
5. The academic year lasts from September to July …	e) has a long-standing history.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The unique approach … education and self-development … the course … 15 years … Britanka have secured its high status.
2. The educational process is completely … English there.
3. Study … architecture … Russia is built…the Western model.
4. It was established … 1930, now it has become a part … Voronezh State Technical University.
5. Strelka Institute is an international educational project, founded …2009 and located…Moscow and supported…foreign architects.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Voronezh Architectural Institute was established …
   a) in 1930; b) in 1946.
2. Strelka Institute is an international educational project, …
   a) located in Moscow; b) located in St. Petersburg.
3. The Britanka aims to educate the next generation of …
   a) economists and builders; b) architects and designers.
4. In Russia architects may be trained …
   a) at some special architectural institutes; b) at architectural faculties with correspondence department.
5. Voronezh State University of Architecture and Civil Engineering became a part of a well-respected Voronezh State Technical University …
   a) in 2008; b) in 2016.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Воронежский архитектурно-строительный институт имеет долгую историю.
2. Образование в России строится по западной модели и имеет последовательные ступени: бакалавриат, магистратуру и аспирантуру.
3. Сегодня открываются новые престижные и перспективные архитектурные школы.
4. Британка зарекомендовала себя на протяжении уже 17 лет как учреждение с уникальным подходом к саморазвитию и образовательному процессу в целом.
5. Для того чтобы получить диплом, студентам надо сдать экзамены по ключевым предметам.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

These are the most ancient architectural **e… i…** in our country. But in some other Russian cities we also may find renowned institutions that **t…** specialists in such **f…** as Town-**P…**, **A…** of Residential and Public **B…,** Architectural **D…**, Architecture of **I…** Buildings, Theory and **H…** of Architecture, **R…** of Architectural **M…**, Interior Architecture, **L…** and so on. Such **u…** exist for instance in Yekaterinburg, Novosibirsk, Tomsk and Voronezh.

Voronezh **A…** Institute has a long-**s…** history; it was established in 1930, now it has become a **p…** of a well-respected Voronezh State **T…** University.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Where are architects trained in Russia? (many engineering institutes)
2. What are the most famous universities of our country? (Moscow Architectural Institute; Moscow School of Painting, Sculpture and Architecture; Saint-Petersburg State University of Architecture and Civil Engineering)
3. What do you know about history of Voronezh Architectural Institute? (long-standing; was established ; a part of)
4. What Russian prestigious architectural schools of present days do you know? (Strelka Institute for Media, Architecture and Design or The British Higher School of Art and Design.)
5. What are the successive stages of the educational process in Russian high school? (Bachelor's degree, Master's degree, Post-graduate Course.)

ЗАДАНИЕ 13. Расскажите об архитектурном образовании в России по следующему плану, используя слова, данные в скобках.

1. In Russia architects are trained at … (special architectural and artistic institutes)
2. The most famous universities (Moscow Architectural Institute; Moscow School of Painting, Sculpture and Architecture; Saint-Petersburg State University of Architecture and Civil Engineering)
3. Voronezh Architectural Institute (a long-standing history; a well-respected Voronezh State Technical University;to takeexams)
4. New forward-looking and prestigious architectural schools (Strelka Institute for Media, Architecture and Design; The British Higher School of Art and Design)
5. The Western model of education (Bachelor's degree, Master's degree, Post-graduate Course; to get a diploma).

Тексты для самостоятельной работы по теме «Architecture»

Text A

Прочитайте текст и выполните задание.

Sir Christopher Wren

Sir Christopher Wren (20 October 1632 – 25 February 1723) is one the most significant architects in British history, and was a recognized astronomer, scholar, and physicist-mathematician. Wren was classically trained at the University of Oxford in physics and engineering where he developed his interest in architecture. He is perhaps most famous for designing London's iconic St Paul's Cathedral, however he is credited with the design of dozens of other churches, government buildings, and hospitals in England. Wren was knighted in 1673.

Wren received his first architectural commission in 1663 from his uncle, the Bishop of Ely, to design a new chapel for Pembroke College in Cambridge. After the Great Fire of London destroyed much of the city in 1666, Wren seized the opportunity to redesign the burned areas with a network of wide boulevards. His proposal was rejected, in part due to difficulties in establishing the owners of the land after such a huge disaster, but he succeeded in building 52 churches across the city, including St Paul's. Shortly thereafter, Wren was appointed surveyor of the Royal Works by King Charles II, tasked with supervising all government buildings and royal palaces in Britain.

His career in architecture quickly took off, receiving contracts to design the Royal Observatory in Greenwich; A hospital for retired soldiers Chelsea and a hospital for sailors in Greenwich; Trinity College Library in Cambridge; and a

significant rebuilding project at Hampton Court Palace in London, which was originally constructed during the reign of King Henry VIII. In addition to his work in architecture, Wren was a lecturer at University of Oxford and Gresham College, and a co-founder of the Royal Society, a prestigious organization devoted to the study of science.

Wren is buried in St Paul's cathedral. In Latin, his grave reads: "If you seek his memorial, look about you."

WRITING TASK

Подготовьте презентацию на английском языке на тему «Известные английские архитекторы».

Text B

Прочитайте текст и выполните задание.

Green Facades

The firm Jakob presents Green façades, which is a wall system, where climbing plants or cascading groundcovers are trained to cover specially designed supporting structures.

Green façades use climbing plants, which are divided into self-supporting plants like root climbers or adhesive-suckers, and plants that need supporting structure, like twining vines, leaf-stem climbers, leaf climbers, or scrambling plants.

There are different types of support structures for Jakob's Green façades:

- **Modular trellis system**. Stainless steel cable and rope wire systems consist of a kit of parts that includes high-tensile steel cables, wire trellises, anchors, spacers, and supplementary equipment. Vertical and horizontal wires can be connected through cross clamps to form a flexible trellis system in various sizes and patterns. And to cover large areas, stainless steel wire-rope nets can be supported on flexible or rigid frames.
- **Single cables system.** Cables can be oriented in a vertical or horizontal arrangement and spaced to suit overall look and/or plant type selected. Single Cable Trellis systems are a great way to draw vines up a space while scrambling plants love to sprawl sideways along horizontal style trellises.
- **Webnet for Greening.** The stainless-steel mesh Webnet as a plant support blends well with modern architecture and enables an exact greening of the façade.

Characteristics:

- Green façades require a less intensive maintenance than living walls do.
- Green façades supports a great diversity of plant species, including a mixture of groundcovers, ferns, low shrubs, perennial flowers, and edible plants.
- Plant materials can be rooted at the base of the structures, in intermediate planters, or on rooftops.

- Green façades can be attached to existing walls or built as freestanding structures.
- This system provides ventilated façades.
- Provides indoor temperature control and noise reduction.
- It improves air quality.
- Generates eco-balance.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Виды зеленых фасадов».

Unit 2
Designing and its Development

Text 1
Design and its Early History

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: décor, form, decoration, design, ornamentation, artist, innovation, production, image, promotion;
b) прилагательные: international, economic, technical, aesthetic;
c) глаголы: décor, design, ornament, produce, form.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. This term **derived** from English and nowadays is used in several meanings.
2. As a goal the union wanted to reorganize the **handicraft** production into the industrial one.
3. They "led a struggle" with **superfluous** decoration of goods produced.
4. The owner wanted his production to **widespread** all over the world.
5. Peter Behrens was one of **co-founders** of "Werkbund".

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, что могут создавать дизайнеры.

Образец: *Designers may create <u>decoration of goods produced</u>.*

1. Designers may create …	a) a new image of a firm b) the entire corporate identity c) furniture

2.	…may be produced by a designer.	d) interiors e) logotype, product design, publicity f) industrial design g) any graphic design

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **metal-worktechnology** – методика работы с металлоконструкциями
2) **promotion of goods** – продвижениетовара
3) **the entire corporate identity** – фирменный стиль организации под ключ
4) **to train** – давать образование, учить
5) **to enhance** – усиливать, упрочивать
6) **specifics of molding** – техникалепки
7) **establishment**– учреждение
8) **superfluous** – чрезмерный, избыточный
9) **to turnout** – оказываться
10) **former** – бывший, предыдущий
11) **political pressure** – политическое давление
12) **technical training** – техническое образование
13) **a specialized course** – специальный курс
14) **the Nazi regime** – нацистский режим
15) **knowledge in handicraft** – знание ремесленной работы

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Design and its Early History

"Design" as a term came toRussia not so long ago – in the second part of the XX-th century. This term derived from English and nowadays is used in several meanings, most widespread of which are décor, decoration, ornamentation – in a more theatrical, demonstrative sense; and constructing, planning – with a rather engineering meaning.

In 1907 in Germany an industrial union named "Werkbund" was founded, which united industrialists, architects, artists and merchants. Its creation was demanded by economic and aesthetic causes in order to make craftsmen be able to conquer the international market. The founder, an architect Hermann Muthesius, was the president of the union till 1914.

As a goal the union wanted to reorganize the handicraft production into the industrial one and to create some ideal samples for manufacturing; they "led a struggle" with superfluousdecoration of goods produced. Their program was devoted to using and selecting the best ideas and opportunities in art, trade, manufacturing in order to unite the largest industrialists. Peter Behrens who was one of co-founders of

“Werkbund” was invited as an art director to AEG Corporation that produced different electric staff: lamps, motors, tools. As the owner wanted his production to widespread all over the world, he was interested in creating a new image of his firm (that was an innovation in promotion of goods of that period). So P. Behrens designed the entire corporate identity - logotype, product design, publicity, etc.Virtually, P. Behrens work for AEG Corporation turned out to be revolution in the world of design and for he is considered to be the creator of industrial designas a basic form of design in general.

In 1919 in a little German town Weimar, there was founded “Bauhaus”– the first institution to train designers. The head of the establishment was a German architect Walter Gropius, a former Peter Behrence's student. During a very short period “Bauhaus” managed to become a large design-training center.

First year student had a specialized course to study ceramics, furniture, textile. The study included technical subjects – Werklehre and artistic course – Kunstlehre, also some knowledge in handicraft was necessary for a future designer.

The Bauhaus goods differed in design and graphics. Technical training consisted of studying of tools, metal-work technologies, etc. The students were taught all the specifics of molding and colour mixing techniques. During the last years of studying the theoretical basis in the study program was enhanced.

But in 1930 the college was closed as a result of political pressure of the Nazi regime.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) спецкурс	a) the entire corporate identity
2) политическое давление	b) a large design-training center
3) знание ремесленной работы	c) metal-work technology
4) первокурсник	d) specifics of molding
5) методика работы с металлом	e) knowledge in handicraft
6) крупный образовательный центр для обучения дизайну	f) a specialized course
7) техникалепки	g) a first year student
8) фирменный стиль организации под ключ	h) political pressure

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. This term is used in several meanings, most widespread of which are …	a) studying tools, metal-work technologies.
2. So P. Behrensdesigned the entire corporate identity …	b) ideas and opportunities in art, trade and manufacturing.

3. Technical training consisted of …	c) specifics of molding and colour mixing techniques.
4. The program was devoted to using the best …	d) décor and planning.
5. The students were taught all the …	e) logotype, product design, publicity.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. … 1907 … Germany an industrial union named “Werkbund” was founded.
2. The Bauhaus goods differed … design and graphics.
3. But … 1930 the college was closed as a result … political pressure.
4. This term derived … English and nowadays is used … several meanings.
5. Their program was devoted … using the best ideas ... art.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. But in 1930 the college was closed …
   a) as a result of internal misunderstandings; b) as a result of the Nazi regime.
2. The Bauhaus goods …
   a) had identical design and graphics; b) differed in design and graphic.
3. The union “led a struggle” with …
   a) superfluous decoration of goods produced; b) lack of décor on the goods.
4. The head of the “Bauhaus” was Walter Gropius, …
   a) a former P. Behrence's student; b) a former H. Muthesius's student.
5. “Design” as a term came to Russia not so long ago – …
   a) in the second part of the XXth century; b) in the first part of the XXth century.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Петер Беренс является основателем немецкого промышленного союза «Веркбунд».
2. В 1919 году в немецком городке Веймар было создано сообщество Баухаус, главой которого стал Вальтер Гропиус.
3. Программа была направлена на поиск и отбор наиболее перспективных решений в искусстве, торговле и производстве.
4. Студентов учили различным особенностям лепки и техникам смешивания цветов.
5. Петера Беренса считают основателем промышленного дизайна, он создавал фирменный стиль компании от А до Я.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

"D…" as a term came to **R…** not so long ago – in the **s…** part of the XX th **c…** This term **d**… from English and **n…** is used in several **m…**, most widespread of whichare décor, **d…**, **o…** – in a more theatrical, demonstrative sense; and **c…,** planning – with a rather e… meaning.

In 1907 in **G…** an industrial union named "Werkbund" was **f…,** which united industrialists, **a…**, artists and merchants. Its creation was demanded by **e…** and aesthetic causes in order to make craftsmen be **a…** to conquer the **i…** market. The founder, an architect Hermann Muthesius, was the **p…** of the union till 1914.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. How do we understand the meaning of the word "design"? (décor, decoration, ornamentation, constructing, planning)
2. What were the reasons of the industrial union foundation? (economic, aesthetic causes, to make craftsmen, be able, to conquer the international market)
3. What was the goal of the industrial union? (to reorganize the handicraft production into the industrial one)
4. When and where was the first institution training artists founded? (the first institution to train designers)
5. What did the students study in "Bauhaus"? (to study ceramics, furniture, textile)

ЗАДАНИЕ 13. Расскажите об истории дизайна по следующему плану, используя слова, данные в скобках.

1. "Design" as a term (décor, decoration, ornamentation, constructing, planning)
2. an industrial union named "Werkbund" (economic and aesthetic causes; Hermann Muthesius)
3. The program of "Werkbund" was devoted to (to reorganize the handicraft production, art, trade, manufacturing)
4. "Werkbund" innovation in promotion of goods (Peter Behrens; a new image of the firm; the entire corporate identity, industrial design)
5. "Bauhaus"opening (the first institution to train designers; Walter Gropius; a large design-training center)
6. The study program of"Bauhaus" (to study ceramics, furniture, textile; goods differed in design and graphics; molding and colour mixing techniques)
7. Closure of "Bauhaus" (political pressure of the Nazi)

Text 2
The Process of Designing

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: process, brief, collaboration, design, project, organization, mix, service, engineer, objective;
b) прилагательные: brief, creative, strategic, effective, final, objective;
c) глаголы: process, design, project, mix, focus, create, start, manufacture.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Design work begins with a **brief** to determine **the aims and objectives** of a project.
2. The organization wants to make its service more **efficient**.
3. It helps to represent the designers' ideas to the organization at a large **scale**.
4. Observing customer behaviour not only makes it easier for designers to create something that **fulfils a need**.
5. Perhaps it faces a decision between improving an existing product or **launching** something completely new.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, что должен учитывать дизайнер в своей работе.

Образец: *In his work designer should <u>determine targets and parameters of a project</u>.*

1. In his work designer should…	a) research needs of a client b) take decisions about how to go ahead with a project c) collaboratewith a client d) provide customer-service support e) define and solve the problems if any f) determine the aims and objectives of a project g) plan a project effectively
2. Designeris recommended to…while working upon a project.	

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **brief** – задание на проектирование
2) **implementation** – реализация
3) **to go ahead** – двигаться, идти вперед

4) **to have a hand** – участвовать
5) **customer-focused** – клиентоориентированный
6) **to face** – сталкиваться
7) **to improve** – улучшать,-ся
8) **aims and objectives** – цели и задачи
9) **crucial** – решающий
10) **internal resources** – внутренние ресурсы
11) **to be aware** – быть в курсе, знать, осознавать
12) **customer-service support** – поддержка клиента

ЗАДАНИЕ 5. Прочитайте и переведите текст.

The Process of Designing

The design process is not a mysterious activity designers carry out. It starts when a designer takes decisions about why and how to go ahead with a project.

Although designers provide a particular mix of skills and creativity, the design process works best when it is collaboration between the design team and the people it works for.

Design work begins with a brief to determine the aims and objectives of a project and certain targets and parameters for its completion. But, ideally, the design team needs to be involved before the brief is even written for two reasons – first, its members will understand the brief better if they have had a hand in composing it and, secondly, the customer-focused, creative skills that designers have can help decide the direction the project should take.

An organization and its designers need to ask certain questions right at the start - why is design work needed? Perhaps the organization wants to make its service more efficient, or perhaps it faces a decision between improving an existing product or service or launching something completely new. By understanding both the organization's strategic objectives and customer needs, designers can define the problem before working towards a solution.

Research needs to be carried out both before and during the design process. Design research focuses on the user. Observing customer behaviour not only makes it easier for designers to create something that fulfils a need, it can also provide creative inspiration. Along with visualization, it also helps to represent the designers' ideas to the organization at a large scale.

To plan a project effectively, companies and organizations need to take into account all the internal resources, people and information the project will require, from materials to customer-service support. The design team will need to be aware of these too.

The relationship between the designer and the organization that hascommissioned the design work is crucial. The best relationships are a two-way

street, where each party isreceptive to theconcerns of the other. Communication needs to be maintained throughout the design process.

The final stage is implementation – by manufacturers, engineers, Information Technologies experts or service providers.

Brief – the design documents that encapsulate all of the specification to which the design team will work.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

1) дизайнер принимает решение	a) brief
2) поддерживать, обслуживать	b) a two-way street
3) он сталкивается	c) crucial
4) в крупном масштабе	d) service providers
5) поставщик услуг	e) at a large scale
6) взаимонаправленный процесс	f) he faces
7) иметь наиважнейшее значение	g) a designer takes decisions
8) задание на проектирование	h) maintain

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Design research …	a) a brief to determine the aims and objectives of a project.
2. Design work begins with …	b) throughout the design process.
3. The relationship between the designer and the organisation …	c) focuses on the user.
4. To plan a project effectively, companies need to take into account …	d) that has commissioned the design work is crucial.
5. Communication needs to be maintained …	e) all the internal resources the project will require.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The relationship … the designer and the organization is crucial.
2. To plan a project effectively, companies and organizations need to take … account all the resources.
3. Designers should define the problem … working … a solution.
4. Design work begins … a brief to determine the aims and objectives.
5. Designer should take decisions … why and how to go …. …. a project.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. The relationship between the designer and the organization that has commissioned the design work is …
   a) optional; b) crucial.
2. Design work begins with …
   a) a brief; b) designer's imagination.
3. Brief is the document that…
   a) encapsulates all of the specification to which the design team will work;
   b) encapsulates all of the creative ideas that a designer managed to imagine.
4. The process of designing starts when a designer …
   a) design team and a customer sign a contract;
   b) takes decisions about why and how to go ahead with a project.
5. Designers work best when it is …..
   a) designer's a stretch of the imagination;
   b) a collaboration between the design team and the people it works for.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Взаимодействие с заказчиком необходимо поддерживать в процессе всей работы над проектом.
2. Анализ объекта должен сфокусироваться на заказчике.
3. Дизайнеру необходимо понять суть проблемы, перед тем как начать искать поиск ее решения.
4. Наилучший вид взаимоотношений – это двунаправленный процесс, когда все прислушиваются друг к другу.
5. Проектная и дизайнерская работа должна начинаться с брифа, чтобы лучше понять цели и задачи данного проекта.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

R… needs to be carried out both **b…** and **d…** the design process. Design research **f…** on the user. Observing customer behaviour not only makes it easier for designers to **c…** something that **f…** a need, it can also provide **c…** inspiration. Along with **v…**, it also helps to represent the designers' ideas to the organization at a large **s…** .

To plan a project **e…**., companies and organizations need to take into **a…** all the internal **r…**, people and **i…** the project will require, from materials to customer-service **s… .** The design **t…** will need to be aware of these too.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. How does the design process start? (a designer takes decisions; a brief; to determine the aims and objectives of a project)
2. What kind of mix is the design process? (mix of skills and creativity)
3. What is a brief? (the design documents)
4. Why should an organization and its designers ask certain questions right at the star to the design process? (designers can define the problem)
5. What do you know about design research? (focuses on the user)
6. What do organizations need to take into account to plan a project effectively? (the internal resources, people and information)

ЗАДАНИЕ 13. Расскажите о процессе работы над дизайном помещений по следующему плану, используя слова, данные в скобках.

1. What is the design process (a mysterious activity)
2. Design work beginning (a collaboration between the design team and the people; a brief;the aims and objectives of a project; the customer-focused skills)
3. Observing customer behavior (fulfil a need; visualization; to represent the ideas at a large scale)
4. The resources behind the project (the internal resources, people, information; materials; customer-service support)
5. The relationship between the designer and the organization (crucial; a two-way street; receptive to the concerns of the other; throughout the design process)
6. The final stage (manufacturers, engineers, Information Technologies experts)

Тексты для самостоятельной работы по теме «Designing and its Development»

Text A

Прочитайте текст и выполните задание.

Case Study Houses: Lessons on Modern, Low-Budget and Easy to Build Living Spaces

Between 1945 and 1966, the Case Study Houses program, following the Weißenhof-siedlung exposition, commissioned a study of economic, easy-to-build houses. The study included the creation of 36 prototypes that were to be built leading up to post-war residential development.

The program's experiment not only defined the modern home and set it apart from its predecessors, but it also pioneered new construction materials and methods in residential development that continue to influence international architecture to this day.

Those types of houses captured the new ways that people used and lived in the contemporary home: listening to music, watching movies, entertaining, and relaxing. These functions led to the introduction of open floor plans and multi-purpose rooms divided between public and private spaces, which quickly became the norm for modern house design.

In this sense, living spaces also began to stand out for the creative details that began to link the inside of the residence with the outside, mainly by maximizing the use of open air spaces. Sliding doors, furniture, and other elements were another facet to the personalization of spaces in an attempt to satisfy the tastes and wants of the future residents while keeping in mind their security and privacy.

As can be seen in numerous examples, the decision to use materials such as cement blocks, plywood, and industrial glass dramatically reduced the project's costs. In turn, by using the resistance of the metal, the designers were able to use smaller dimensions for the columns and beams, resulting in smaller frameworks to enclose the spaces. Maintenance costs were even lower. The materials could be left exposed in their raw form or covered with a light coat of paint and could easily be replaced in the event of breakage.

An interesting aspect that could be seen in numerous houses was modular construction – giving homes a simple geometry that not only facilitated the standardization of the building process but also allowed homes to be pre-manufactured as a way to reduce building time.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Программа перспективного строительства Case Study House».

Text B

Прочитайте текст и выполните задание.

Dune Playground / Bureau Druzhba

Bureau "Druzhba" promotes values and principles of child friendly spaces, both among developers and municipal government. A project for Sminex is a good example of shared values between a customer and an architect.

The playground for residential estate “Malaya Ordynka 19” is based on 8 principles of child-friendly playspaces:

1. **Abstract form instead of themed image.** Playing every day child must have an opportunity to choose a game theme and change it as often as needed! A submarine, sand dunes, animal burrows in the garden, the hobbit valley – scenery depends only on the imagination of the child.

2. **Bright color is not a main goal**.The idea that playground must be bright and colorful is a myth and does not correspond to the results of the psychological and medical researches. Balanced harmony of subtle color shades and natural colors with

several bright accents provides an opportunity for kids for different game scripts on a playground.

3. **Objects of multifunctional use.** Unidentified objects with intricate function force children to explore new purposes of it.

4. **Maximum possibilities.** The regular set of play equipment on site of 100 sq. m. is: a single swing, a small carousel and a sandpit. The whole world can be created in the same space if we take into account the children's perception.

5. **Awared risk is an important part of the game.** Risk and danger are not the same! Children must experience their physical abilities on a playground, otherwise they might find a really dangerous place to do it.

6. **Unpredictable, irregular space is a miracle.** The child is inspired with new world where anything can happen and the modern equipment is just a part of it.

7. **Area zoning**: younger/older, active/quiet, common/private. There must be the place for everyone.

8. **Make changes.** On every playground there must be an opportunity to change the space and to move parts. Different types of granular materials, plants, water, chalk surfaces, inner spaces – children can leave their mark.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Особенности планирования детских площадок».

Unit 3
Restoration and Conservation

Text 1
Conservation and Restoration of Cultural Heritage

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: conservator, restorer, professional, object, artifact, term, activity, theory, biology, condition, archaeology, furniture, textiles, ceramics, examination, procedure, action, protection;
b) прилагательные: historic, artistic, cultural, aesthetic, spiritual, principal, private, artistic, rare;
c) глаголы: conserve, restore, specialize, determine.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. A conservator preserves and restores **cultural heritage**.
2. Cultural heritage is objects of significant **cultural or historical value**.

3. A restorer is a professional activity **involved** in the conservation of **valuable objects**.
4. A conservator should possess both theoretical knowledge and practical **technical skills**.
5. Conservators' principal aim is the preservation of **man-made heritage**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, где работают реставраторы.

Образец: *Conservators (restorers) can work in <u>museums</u>.*

1. Conservators can work in …	a) heritage protection services b) conservation enterprises c) the Fine Arts Museums d) exhibitions e) churches f) cathedrals g) displays
2. Restorers can work in …	

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **cultural heritage** – культурное наследие
2) **a professional –** профессионал, специалист
3) **Romance and Germanic languages –** романские и германские языки
4) **to be responsible for –** нести ответственность
5) **to deteriorate –** разрушаться, портиться
6) **preliminary –** подготовительный, предварительный
7) **extent –** объем, степень, размер
8) **alteration –** изменение
9) **to maintain –** поддерживать, сохранять
10) **sacrifice –** убыток, потеря
11) **to comprehend –** понимать, постигать
12) **decay –** разрушение
13) **display –** выставка
14) **to enhance –** улучшать, повышать
15) **conservation –** сохранение

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Conservation and Restoration of Cultural Heritage

A conservator (restorer) of historic buildings is a professional who preserves and restores objects (artistic and cultural artifacts) of significant cultural or historical value, also known as cultural heritage.

The term "conservator" is used in the English speaking countries and the term "restorer" in those where Romance and Germanic languages are spoken.

A conservator (restorer) is a professional activity involved in the conservation of objects which are valuable in artistic, aesthetic, spiritual, religious, cultural, social, scientific or historical terms. A conservator (restorer) possesses both theoretical knowledge (fine arts theory, cultural and technological history, chemistry, biology) and practical technical skills.

Conservators (restorers) are responsible for keeping works of art or other historic objects in good condition or working order. Their principal aim is the preservation of man-made heritage.

They must understand why an object deteriorates and how to conserve (restore) it. They usually specialize in a particular area such as archaeology, furniture, paintings, textiles, books, industrial exhibits, ceramics or glass.

The activity of the conservator (conservation) consists of technical examination, preservation, and restoration of cultural property. Technical examination is the preliminary procedure taken to determine the documentary significance of an artifact; original structure and materials; the extent of its deterioration, alteration, and loss; and the documentation of these findings. Preservation (conservation) is an action taken to prevent damage to cultural properties by control of their environment and treatment of their structure in order to maintain them as nearly as possible in an unchanging state. Restoration is an action taken to make a damaged artifact with minimal aesthetic and historic sacrifice.

Conservators (restorers) work in museums, in official heritage protection services, in private conservation enterprises or independently. Their task is to comprehend the material aspect of objects of historic and artistic significance in order to prevent their decay and to enhance our understanding of them.

Conservators can also be involved in organising exhibitions and displays of rare objects for the general public. They may also be responsible for the conditions in which exhibits are stored and displayed, and must control temperature, humidity and lighting.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) историческое и художественное значение	a) humidity and lighting
2) организация выставок	b) historic buildings
3) экспонаты хранятся	c) independently
4) исторические здания	d) historic and artistic significance
5) независимо, самостоятельно	e) organising exhibitions
6) неизменное состояние	f) exhibits are stored
7) влажность и освещение	g) to prevent damage
8) полученные данные	h) an unchanging state
9) предотвращать повреждение	i) findings

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Conservators are responsible for …	a) the documentary significance of an artifact.
2. Restorers are involved in organizing …	b) and practical technical skills.
3. Technical examination determines …	c) keeping historic objects in good condition.
4. Artistic and cultural artifacts of cultural or historical value …	d) displays of rare objects for the general public.
5. A conservator possesses theoretical knowledge …	e) are known as cultural heritage.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. A conservator of historic buildings restores objects … cultural or historical value.
2. Conservators are responsible … the conditions in which exhibits are stored and displayed.
3. Restorers are involved … organizing exhibitions.
4. The process of conservation consists … technical examination, preservation of cultural property.
5. The aim of conservation is to prevent damage to cultural properties … control of their environment and treatment of their structure.
6. Their task is to maintain artifacts … minimal aesthetic and historic sacrifice.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. A conservator preserves and restores objects of …
   a) cultural or historical value; b) the modern life .
2. The term “conservator” is used in …
   a) Romance and Germanic languages; b) the English speaking countries.
3. Conservators’ principal aim is the preservation of …
   a) man-made heritage; b) nature.
4. They must understand how…
   a) to conserve a damaged artifact; b) to sell an artifact.
5. Conservators can be involved in organizing displays of rare objects for …
   a) the general public; b) several people.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Реставраторы сохраняют предметы культурного наследия.
   (Conservators preserve and restore artistic and cultural artifacts of significant cultural or historical value.)
2. Культурное наследие страны – это предметы, унаследованные от прошлых поколений.
   (Cultural heritage of the country is objects of significant value inherited from past generations.)
3. Реставратор должен иметь теоретические знания и практические навыки.
   (A restorer possesses both theoretical knowledge and practical technical skills.)
4. Реставраторы специализируются в определенной области.
   (Conservators specialize in a particular area such as archaeology, furniture, paintings, textiles, books, industrial exhibits, ceramics or glass.)
5. Задача реставратора сохранять предметы культурного наследия в неизменном виде.
   (The task of a restorer is to maintain objects in an unchanging state.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

A conservator of **h**… buildings preserves objects of significant value. Their principal **a**… is the preservation of man-made heritage. They must understand how to **c**… an object. The conservation consists of technical examination, preservation, and restoration of **c**… property. Technical examination determines the documentary **s**… of an artifact. Conservators workin museums, in official **h**… protection services, in private conservation enterprises.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is known as cultural heritage? (artistic and cultural artifacts)
2. Who preserves and restores objects of cultural heritage? (conservator; significant cultural or historical value)
3. What knowledge should a conservator possess? both theoretical (fine arts theory, cultural and technological history, chemistry, biology and practical technical skills)
4. What are conservators responsible for? (keeping works of art in good condition)
5. What is their principal aim? (the preservation of man-made heritage)
6. What area do they usually specialize in? (archaeology, furniture, paintings, textiles, books, industrial exhibits, ceramics or glass)
7. What activity does the conservation consist of? (technical examination, preservation, and restoration)
8. Where do conservators work? (in museums, in official heritage protection services, in private conservation enterprises, independently)

ЗАДАНИЕ 13. Расскажите о реставрации культурного наследия по следующему плану, используя слова, данные в скобках.

1. Cultural heritage (artistic and cultural artifacts of significant value).
2. A professional activity of a conservator (to preserve and restore the valuable objects).
3. The principal aim of the conservation (man-made heritage).
4. The activity of the conservation (technical examination, preservation, and restoration of cultural property).
5. Technical examination (the documentary significance of an artifact).
6. The action of restoration (minimal aesthetic and historic sacrifice).
7. Conservators' places of work (museums, heritage protection services, conservation enterprises, independently).

Text 2
The Restoration of Heritage Buildings

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: type, plastering, monument, ingredient, structure, conflict, product, restoration, object, detail, inspection;
b) прилагательные: climatic, unique, historic, innovative, modern, original, authentic, artistic;
c) глаголы: declare, start, react, base, integrate, falsify.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Our country has a large number of **heritage buildings** made of different types of materials.
2. The main cause of heritage buildings deterioration is **environmental conditions**.
3. Deterioration can start from bedding and **jointing mortars**.
4. Many famous structures **are carved in stone**.
5. The task of restoration is **to revive** the original concept of the object.

ЗАДАНИЕ 3. Используя выражения, данные справа, скажите, какие компоненты входят в состав растворов исторических сооружений.

Образец: *Historic mortars consist of <u>different ingredients</u>.*

1. The ingredient of historic mortars is… 2. To improve the quality of mortars … is added.	a) lime b) fine aggregate c) molasses d) egg e) coconut oil f) milk

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **heritage buildings** – исторические здания
2) **jointing** – соединение кирпичной кладки
3) **bedding –** основание, фундамент
4) **plastering –** штукатурные работы
5) **to expose –** подвергать воздействию
6) **to affect –** повреждать
7) **deteriorated conditions –** ухудшенные условия
8) **deterioration –** повреждение, порча
9) **fine aggregate –** мелкий заполнитель
10) **additives materials –** примеси
11) **molasses –** меласса, патока
12) **advances** – достижения, успехи
13) **to carve –**высекать, вырезать
14) **pollutant –** загрязняющее вещество
15) **deteriorating agencies –** разрушающие вещества

16) **to revive –** восстанавливать
17) **reintegration –** восстановление
18) **restoration –** реставрация
19) **features –** конструктивные особенности, свойства
20) **replacement –** замена

ЗАДАНИЕ 5. Прочитайте и переведите текст.

The Restoration of Heritage Buildings

Every country has a large number of heritage buildings made of different types of stone, jointing, bedding and plastering materials. Heritage buildings located in different parts of the country exposed to different climatic conditions and each building material is affected in its own unique way by the environment.

For example, India has over 15000 historical buildings out of which 3570 buildings have been declared as national monuments and approximately same number has been declared as state important monuments.

Most of the heritage buildings are in deteriorated conditions and main cause of their deterioration is environmental conditions.In most of the cases, deterioration starts from bedding and jointing mortars. The main ingredients of historic mortars are lime, fine aggregate, additives materials like molasses, egg, coconut oil, milk etc. are also added sometimes with a view to improve the quality of mortars.

There is a need to investigate the usefulness of these materials from the present day point of view. Advances in science and technology can provide innovative solutions. Many important work of art or famous structures are carved in stone. Mortar is the weakest link and easily reacts with the pollutants and other deteriorating agencies available in the environment. Living in the growing industrial surroundings, there is a conflict between the use of old materials and modern products.

The objective of restoration is to revive the original concept to the object. Restoration and reintegration of details and features occur frequently and is based upon respect for original materials, original design and authentic documents. Replacement of missing and decayed parts must integrate harmoniously with the whole, but must be distinguishable on close inspection from the original so that the restoration does not falsify the artistic or historic value.

Cleaning of buildings is also a form of restoration and the replacement of missing decorative elements is another. The scope of building craft skills in restoration is from the simple repair and maintenance of domestic properties to the most complicated work.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) материалы для штукатурных работ	a) main cause of deterioration
2) национальные памятники	b) environmental conditions
3) основная причина разрушения	c) jointing mortars
4) условия окружающей среды	d) plastering materials
5) растворы для соединения кирпичной кладки	e) to improve the quality
6) улучшить качество	f) the original concept
7) первоначальный замысел	g) distinguishable
8) отличимый	h) national monuments
9) строительные профессиональные навыки	i) building craft skills

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Deterioration starts from …	a) lime, fine aggregate, additives materials.
2. The main ingredients of historic mortars are …	b) innovative solutions.
3. Advances in science and technology can provide …	c) bedding and jointing mortars.
4. Many important work of art are carved …	d) the artistic or historic value.
5. The restoration does not falsify …	e) in stone.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Heritage buildings are made … different types of materials.
2. They are located … different parts of the country exposed to different climatic conditions.
3. Deterioration starts … bedding and jointing mortars.
4. Famous structures are carved … stone.
5. Replacement of missing and decayed parts must integrate … the whole.
6. Restoration is based … respect for original material.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Each building material is affected in …
   a) its own way by the environment; b) the same way.

2. India has …
   a) 3570; b) 15000 national monuments.
3. The main cause of deterioration of heritage buildings are …
   a) people; b) environmental conditions.
4. Additives materials are added to improve …
   a) the quality of mortars; b) the interior of the building.
5. Mortar is …
   a) the strongest; b) the weakest link.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Необходимо исследовать растворы, которые применялись при строительстве исторических зданий.
   (There is a need to investigate the usefulness of historic mortars from the present day point of view.)
2. Ближайшее промышленное окружение создает конфликт между использованием старых и современных материалов.
   (Living in the growing industrial surroundings, there is a conflict between the use of old materials and modern products.)
3. Задача реставрации – это восстановить первоначальный замысел объекта.
   (The objective of restoration is to revive the original concept of the object.)
4. Реставрация деталей и характерных свойств основывается на уважительном отношение к первоначальному материалу.
   (Restoration of details and features is based upon respect for original materials.)
5. В большинстве случаев повреждение начинается с фундамента и строительных растворов.
   (In most of the cases, deterioration starts from bedding and jointing mortars.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

A large number of **h**…buildings are made of different types of stone. They are exposed to different **c**… conditions. Deterioration starts from bedding and **j**… mortars. The main ingredients of historic mortars are **l**…, fine aggregate, and additives materials. They are added to improve the **q**… of mortars. Many famous work of art are carved in **s**… . Mortar is the weakest **l**… and easily reacts with the pollutants. The task of restoration is to revive the original **c**…of the object. The scope of building craft skills in restoration is from the simple **r**… to the most complicated work.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What are a large number of heritage buildings made of? (stone, plastering materials)
2. How many historical buildings are there in India? (15000)
3. What is the main cause of deterioration of heritage buildings? (environmental conditions)
4. How does deterioration of heritage buildings usually start? (from bedding and jointing mortars)
5. What are the main ingredients of historic mortars? (lime, fine aggregate, additives materials)
6. What materials are added to improve the quality of historic mortars? (additives materials)
7. What is the objective of restoration? (to revive the original concept)
8. What is the scope of building craft skills in restoration? (repair and maintenance, complicated work)

ЗАДАНИЕ 13. Расскажите о реставрации исторических зданий по следующему плану, используя слова, данные в скобках.

1. Building materials for heritage buildings (different types of stone, jointing, bedding and plastering materials).
2. The main cause of deterioration of heritage buildings (environmental conditions).
3. The beginning of deterioration (bedding and jointing mortars).
4. The ingredients of historic mortars (lime, fine aggregate, additives materials).
5. The objective of restoration (to revive the original concept of the object).
6. Restoration of details and features (original materials, original design and authentic documents).
7. Cleaning of buildings as a form of restoration (missing decorative elements).
8. Building craft skills in restoration (repair and maintenance of domestic properties).

Тексты для самостоятельной работы по теме «Restoration and Conservation»

Text A

Прочитайте текст и выполните задание.

Middle Ages Conservation Principles

The essence of modern conservation is founded in the new historical consciousness and in the resulting perception of cultural diversity. Architects of the 17-18th centuries while still thinking in traditional terms, were already aware of the

historicity of ancient works of art. The approach became more specific in the antiquarian criticism of classically oriented church renewals in England in the 1790s and in France in the 1830s, and in the age of Romanticism, when the values and the gradual abolition of the ideal, universal references for art resulted in an emphasis on the artist's individuality and creativity.

In the mid-nineteenth century, criticism was directed at the stylistic restoration, the often arbitrary renewal and reconstruction of historic structures. As a result of the efforts of the Society for the Protection of Ancient Buildings, the conservation movement spread abroad, to France, Germany countries, Greece, Italy, and even to other continents, e.g. to India.

While initially leading a movement based on criticism, conservation gradually became accepted as the modern approach to the care of historic buildings and works of art, and thus also the principal recommendation for the policies of maintenance and conservative repair.

WRITING TASK

Напишите эссе на английском языке на тему "Modern Conservation Principles".

Text B

Прочитайте текст и выполните задание.

Development of Conservation Policies in England

The anti-restoration movement criticized restoration architects for the destruction of the historical authenticity of the buildings, and fought for their protection, conservation and maintenance. As a result, in the English language, the word 'restoration' came to indicate something negative, and was replaced by the word 'conservation'; the movement itself became the 'conservation movement'.

Architects saw a historic building, painting or sculpture as a unique creation by an artist in a specific historic context. Such a genuine work of art was based on man's perception of beauty in nature. Age in itself contributed to beauty; the marks of age could thus be seen as an essential element in an object after several centuries.

To restore a historic building or a work of art, even using the methods of the historic period, in any case, meant much reproduction of its old forms in new material. Architects first should create architecture of such quality that it could become historical, and secondly, to, preserve as the most precious of inheritances of past ages. The restorer's duty is to protect historical objects, to conserve them and to transmit them to future generations, because one of the fundamental conditions of a man is to rely on the past. A historic city does not consist only of single monuments, but is an ensemble of different types of buildings, spaces and details.

One of the middle ages architects gave the following definition of restoration: Restoration may be defined to be a putting something into a state different from that in which we find it; but similar to that in which it once was.

Preservation activities were based on the principle of caring for authenticity. Preservation of surfaces with decorative painting and fragments of stained glass was recommended.

Thus, the middle age era was an essential period in the development of policies for preservation of historic buildings. It was a period of powerful technical and industrial development, and the growth of urban centres. It was a period of the conservation of cultural heritage in its various aspects, collections and works of art, ancient monuments and public buildings.

WRITING TASK

Подготовьте презентацию на английском языке на тему "Restoration of the Cultural and Historical Objects in the XXI century".

Unit 4
Town Planning

Text 1
Town Planning as a Professional Sphere

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: activity, distance, topography, position, circulation, public, diagram, structure, communication, interest, zone;
b) прилагательные: individual, functional, central, traditional, social, industrial, cultural, active, natural, organic;
c) глаголы: master, absorb, reconstruct, adapt, control, fix, modify.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. New **development**of the areas modifies an existing environment.
2. After the research is complete a **forecast** of future development is made.
3. The **flexible** plan is one of the best ideas that man has ever created.
4. Earlier town plans were always made as **inflexible patterns**.
5. The master plan thus has to define the **ultimate growth of the town**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, какие важные элементы может иметь город.

Образец: *Proper qualities of a successful town plan include <u>good zoning</u>.*

1. Proper qualities of a successful town plan may include …	a) open space for recreation b) shopping areas c) main roads which run between the built-up areas d) industrial areas e) business zones f) a functional pattern g) districts of houses
2. A good city plan may have…	

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **to admit** – принимать
2) **large- scale** – крупномасштабный
3) **to absorb** – поглощать
4) **to modify** – изменять (видоизменять)
5) **environment** – окружающая среда
6) **trend** – направление
7) **dwelling** – жилой дом; жилище
8) **amount** – количество
9) **pollution** – загрязнение
10) **survey** – исследование
11) **forecast** – прогноз
12) **master plan** – генеральный план
13) **flexible** – гибкий
14) **to avoid** – избегать
15) **congestion** – скопление (перенаселенность)
16) **community** – общество; общность
17) **core** – средний; центр
18) **to accept** – принимать
19) **space for recreation** – место для отдыха
20) **ultimate** – окончательный, последний

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Town Planning as a Professional Sphere

Now when large-scale construction and plan-making have become an everyday activity, everyone admits that cities should have a plan. The purpose of a town plan is to give all possible freedom to a person. So it is a cooperative process inwhich architects, economists, engineers, lawyers, landscape architects,doctors, sociologists, surveyors or topographers and other specialiststake part to make the plan as perfect as possible.Interests of the whole population should be taken into account while the city-development is taking place.

New development of the areas modifies an existing environment, and so it is necessary to find out what this environment represents. The trends of population growth, distance from work to home, preferences for different types of dwelling, amount of sunshine in rooms, degree of atmospheric pollution are the key parts that should be analyzed. After the research is complete a forecast of future development is made in the form of a map: the master plan or development plan. As no one can be certain when the development will take place and since a society is an organic thing, with life and movement, the plan of a city must be flexible so that it may be changed and completed in every part when needed.

The plan is not a fixed thing, but one that is continually being adapted to the changing requirements of the community for whom it is designed. Earlier town plans were always made as inflexible patterns, but history has shown that a plan of this description changes in time.

The flexible plan is one of the best ideas that man has ever created about the control of his environment.

Most towns today have a characteristic functional pattern as follows: a central core containing the principal shopping center, business zones, surrounded by districts of houses. In town planning there are different street patterns: gridiron, radial, ring and functional (organic).

Most town planners accept the traditional town pattern. In the preparation of a master plan they care much about definingcitycenter, industrial areas and areas of housing; creation of open space for recreation, the laying down main roads which run between the built-up areas (thus leaving them free of traffic) and connect them to each other.

The master plan thus has to define the ultimate growth of the town, but though the master plan is just a diagram, and even a flexible one, it is the structure upon which all future development has to take place.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний

1) жилой дом	a) suburbs
2) окружающая среда	b) pollution
3) уличный рисунок	c) dwelling
4) загрязнение	d) recreation
5) окрестности	e) environment
6) отдых	f) housing
7) снабжение жильем	g) master plan
8) рост (расширение)	h) industrial area
9) генеральный план	i) development
10) промышленная зона	j) street pattern

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Most town planners accept …	a) man has ever created about the control of his environment.
2. The flexible plan is one of the best ideas that …	b) a forecast of future development is made in the form of a map.
3. After the research is complete …	c) all future development has to take place.
4. The plan of a city must be flexible so that …	d) the traditional town pattern.
5. The master plan is the structure upon which …	e) it may be changed and completed.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The trends … population growth, distance … work … home, preferences … different types … dwellingare the key parts…city-development.
2. … the preparation…a master plan they care much…defining city center.
3. The plan … a city must be flexible so that it may be changed and completed in every part when needed.
4. It is a cooperative process … which architects, economists, engineers, lawyers, topographers take part.
5. The master plan is the structure … which all future development has to take place.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Few town planners accept …..
   a) the traditional town pattern; b) extraordinary town pattern.
2. The master plan is a ….
   a) flexible form; b) a rigid form.
3. Interests of the population should be taken into account when the city-development is….
   a) finished; b) taking place.
4. In town planning distance from work to home and preferences for different types of dwelling….
   a) should not be taken into account; b) should be taken into account.
5. The master plan has to define the ….
   a) ultimate growth of the town; b) final limits of the city.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Каждый город должен иметь свой план.
2. Городской план – это не нечто, замершее и не развивающееся, а наоборот, это гибкая структура.
3. При подготовке генерального плана большое внимание необходимо уделить распределению территорий под промышленные зоны, жилые районы, торговые точки и так далее.
4. Большинство городов имеют типичную функциональную модель.
5. Градостроительство – это процесс сотрудничества, в котором участвуют многиеспециалисты.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

New **d…** of the areas modifies an existing **e.**..., and so it is **n…** to find out what this environment represents. The trends of **p… g…,** distance from work to home, preferences for different types of d…, amount of sunshine in rooms, degree of atmospheric **p…** are the **k…** parts that should be analyzed. After the **r…** is complete a **f…** of future **d…** is made in the form of a map: the **m… p…** or **d…** plan. As no one can be certain when the **d…** will take place and since a **s…** is an organic thing, with life and **m…**, the plan of a city must be **f…** so that it may be **c…** and **c…** in every part when needed.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is the purpose of a town plan? (give, freedom, person)
2. What research is necessary to do for town planning? (population growth, distance from work, preferences)
3. Why must the plan of the city be flexible? (change, complete, part, when needed)
4. Most towns today have a characteristic functional pattern, haven't they? (core, shopping center, business zones, districts of houses)
5. What does the master plan define? (growth, diagram)

ЗАДАНИЕ 13. Расскажите о важности городского планирования по следующему плану, используя слова, данные в скобках.

1. Plan-making has become an everyday activity (large-scale construction; freedom to a person; a cooperative process; should be taken into account)
2. Key ingredientsto analyze (distance from work to home, preferences for different types of dwelling, amount of sunshine in rooms;modify an existing environment)
3. After the research (a forecast of future development)
4. The plan is not a fixed thing (adapt to the changing requirements; the flexible plan)
5. Characteristic functional pattern (a central core; the shopping center; business zones; districts of houses)
6. Most town planners (the traditional town pattern; master plan; defining city center, industrial areas and areas of housing; open space for recreation; the laying down main roads)
7. The master plan requirements (define the ultimate growth of the town)

Text 2
Types of Towns According to Their Plans

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: plans, gridiron, planning, square, type, architecture, cathedral, monument, form, centre, contribution, Egypt, zone, forum, population, Institute, structure;
b) прилагательные: important, regular, circular;
c) глаголы: originate, construct.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Each satellite town has the means of **employment** for a large proportion of its population.
2. In the Renaissance the town was star-shaped with **radial streets** or had gridiron planning.
3. In France squares for the first time included **circuses**.
4. The centre of the town was a **castle** or monastery.
5. **Landscape** played a very important part in Greek town planning.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, какие существуют планы города.

Образец: *There occur <u>many different town-plans</u>.*

1. In town planning theremay be…. 2. In town planning there occur…..	a) radial-circular plan forms b) star-shaped cities with radial streets c) garden- cities d) gridiron plans withmain streets as focal axes e) satellite towns f) city-states g) Linear cities

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **Baroque [ba'rok] –** Барокко
2) **Renaissance [ra'neisns] –** Ренессанс
3) **regular –** правильный
4) **agora –** агора
5) **forum –** форум
6) **city-state –** город-государство
7) **contribution –** вклад
8) **scheme [ski:m] –** план, схема
9) **satellite –** спутник
10) **hexagonal –** шестиугольный
11) **irregular –** неправильный
12) **focalaxes –** основные оси
13) **garden-city –** город-сад
14) **clear** – очищать(ся); расчищать, сносить

15) **focal** – центральный, основной
16) **gridiron** ['g rid a(i)an] **plan** – прямоугольная планировка
17) **thoroughfare** ['0arafea] – оживленная улица; главная артерия (города)
18) **townhall** – ратуша

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Types of Towns According to Their Plans

The most ancient towns had irregular plans, but even in ancient Egypt there appeared the first signs of aregular plan.

In ancient **Greece** the regular town plan continued to develop. The city-states had gridiron plans withmain streets as focal axes and the acropolis and agora as the centre. Landscape played a very important partin Greek town planning and architecture.

In **Rome** the town plan tended to be regular (gridiron plan) with a forum at the intersection of the twomain streets.

Medieval towns had irregular plans. They developed from the old squares. The City of London is anexample of such a town.

More often there occurred the radial-circular plan form. The centre of the town was a castle or monastery and the streets ran radially from it. If the town stood on the bank of a river or the shore of a lake the streetplan took the form of a fan. With the growth of the town new walls were built farther from the centre, and old ones were cleared out to form circular streets. In old **Russia** many towns also had radial-circular planning with a kremlin or monastery in the centre (e.g. Moscow, Novgorod).

In the **Renaissance** the town was star-shaped with radial streets or had gridiron planning. In the centre there was the town hall, cathedral or market square. In the **Baroque** period there was also radial planning with twoor three streets fanning from the cathedral or monument (Versailles, Petersburg and Washington).

In **France** squares were triangular, square or hexagonal in plan and even for the first time included circuses.

The **British** contribution is the satellite town. Each satellite town has the means of employment for a largeproportion of its population. It is similar in character to the garden-city.

At the beginning of the 20th century zoning structure came into being.

The “Linear city” originated in **Spain.** The general principle is the construction of a city for a limited depth on each side of a very wide thoroughfare long residential and industrial zones.

Another scheme was devised in the USSR by some teachers of the Moscow Architectural Institute in thelate 1920s. Its principal feature is that the zones run parallel to each other.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) радиально-круговая планировка	a) the satellite town
2) городской рост	b) the means of employment
3) неправильное планирование	c) streets fan from the cathedral
4) город с линейной застройкой	d) radial-circular planning
5) улицы расходятся веером от собора	e) hexagonal in plan
6) средство обеспечения рабочими местами населения	f) growth of the town
7) город-спутник	g) irregular plan
8) шестиугольный в плане	h) linear city

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. The general principle is …	a) means of employment for a large proportion of its population.
2. Each satellite town has the…	b) new walls were built farther from the centre.
3. With the growth of the town …	c) the construction of a city for a limiteddepth on each side of a very wide thoroughfare.
4. The centre of the town was …	d) triangular, square or hexagonal in plan.
5. In France squares were …	e) a castle or monastery and the streets ran radially from it.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. … old Russia many towns had radial-circular planning …. a kremlin … the centre.
2. They developed … the old squares.
3. The “Linear city” originated … Spain.
4. … the beginning … the 20th century zoning structure came … being.
5. It is similar … character … the garden-city.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Parallel zones thatrun to each it is the otherscheme that was devised….
   a) in the USSR; b) in Spain.
2. In Rome the town plan tended to be ….
   a) irregular; b)regular.

3. The “Linear city” originated in ……
   a) France; b) Spain.
4. In old Russia many towns had planning with …….
   a) a kremlin or monastery in the centre; b) the old square in the centre.
5. With the growth of the town new walls were built ….
   a) closer to the centre; b) farther from the centre.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. В период Ренессанса город имел форму в виде звезды с радиально расходящимися улицами.
2. Основной принцип ленточного города заключается в сильно растянутых вдоль дорог и водных артерий жилых и промышленных зон.
3. В Греции появились города – государства с шахматно-модульной планировкой.
4. Если город с радиально-круговой планировкой располагался на берегу реки, то улицы разбегались от центра в виде веера.
5. В греческом градостроительстве и архитектуре большую роль играл ландшафт.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

The most **a…** towns had **i…** plans, but even in ancient Egypt there appeared the first signs of a **r…** plan.

In ancient Greece the regular town plan continued to **d… .** The city-**s…** had **g…** plans with main streets as **f… a…** and the **a…** and **a…** as the centre. **L…** played a very important partin Greek **t…** planning and architecture.

In **R…** the town plan tended to be regular (gridiron plan) with a forum at the **i…** of the two main **s… .**

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Where do irregular plans occur? (ancient, towns, have, irregular, plans)
2. In what countries were regular plans used? (Rome, Greece, France, Russia)
3. What was in the centre of different towns? (centre, town, castle, monastery, streets, run)
4. What is a radial-circular plan and where does it occur? (growth, town, walls build, farther from, old, form, circular, streets, kremlin, monastery, centre)
5. When did the star-shaped plan appear? (Renaissance)
6. What is the difference between a square and a circus (a circle)? (have, four, angles, no, angles)

ЗАДАНИЕ 13. Расскажите о влиянии плана города на его функционирование по следующему плану, используя слова, данные в скобках.

1. The most ancient towns (irregular plans, regular plans).
2. In ancient Greece (city-states; gridiron plans; focal axes; the acropolis; agora; landscape).
3. The town plan in Rome (a forum; the intersection; the two main streets)
4. Medieval towns (the old squares).
5. The town in the Renaissance (star-shaped; radial streets; gridiron planning; the town hall).
6. Towns in the Baroque period (radial planning; fanning streets; Versailles).
7. The British contribution into town-planning (satellite town; the means of employment).
8. The "Linear city" (a very wide thoroughfare along residential and industrial zones; the zones run parallel to each other).

Тексты для самостоятельной работы по теме «Town Planning»

Text A

Прочитайте текст и выполните задание.

Masterplans in the African Continent

A master-plan is a comprehensive plan of action that envisions the physical, social and economic capacity of a city's future development (Byron, 2018). It provides a detailed account of how a city should look and grow, with regard to its affordability and accessibility in its economies, housing, and public infrastructure. (Byron 2018). Before the advent of computer-aided design (also known as CAD), these systems and processes of design were conducted by hand and physical demonstration. Today we have developed technological tools, such as Building Information Modelling (BIM) that has revolutionized the control, accuracy, and efficiency of complex growth urban development. Unfortunately, the historical conditioning of colonialism is still globally penalizing healthy urban development. For instance, large cities in developing countries, particularly in Africa, are located in some of the fastest-growing economic hubs of the world.

Unfortunately, many seem to have conventional master plans, latent with western urban ideologies that were imposed through colonial planning deeming them chaotic and inadequate. The agendas of these master plans were created to maintain colonial rule and in doing so were designed to socially and economically exploit and segregate colonized people. As a result, the current governing and economic systems in African cities are outdated and retain values that are misaligned with positive

context-appropriate future developments. It is quit essential that new policy frameworks emerge, giving citizens participatory tools to forge economies that uplift a relevant value-system; one of community and shared responsibility.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Важность следования генеральному плану в градостроительстве».

Text B

Прочитайте текст и выполните задание.

Niederhafen River Promenade / Zaha Hadid Architects

Located at Niederhafen on the Elbe River between St. Pauli Landungsbrücken and Baumwall in Hamburg, the upgraded 625 metre river promenade is integral to the modernisation and reinforcement of the city's flood protection system.

In the aftermath of storm surge floods in February 1962 that caused 315 fatalities and destroyed the homes of 60,000 residents, between 1964 and 1968 Hamburg developed a barrier on the banks of the Elbe at Niederhafen to protect the city against floods up to a height of 7.20m above sea level.

Modern hydrology and computer simulations have since analysed and forecast the city's flooding characteristics with greater accuracy; calculating that an increase in the barrier height of 0.80m was required to protect Hamburg from future winter storm surges and extreme high tides. Inspections of Niederhafen's existing flood barrier in 2006 determined that supporting elements of the existing structure were overburdened and its foundations needed significant reinforcement. Later that year, the city of Hamburg organised a competition to design the redeveloped flood barrier and subsequently awarded the project to ZahaHadid Architects. Hamburg's Niederhafen flood protection barrier is in a prominent location that incorporates the city's renowned riverside promenade – a major attraction for tourists and one of Hamburg's most important public spaces. Situated on top of the flood protection barrier, the promenade provides undisturbed views of the Elbe and the port.

With construction of all phases now complete, the redevelopment of Hamburg's Niederhafen flood protection barrier re-connects its river promenade with the surrounding urban fabric of the city; serving as a popular riverside walkway while also creating links with adjacent neighbourhoods. The linear structure is 8.60m above sea level in its eastern section and 8.90m above sea level in its western section to protect the city from maximum winter storm surges and extreme high tides.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Влияние планирования открытых пространств на здоровье и жизнь человека».

PART IV
ROAD ENGINEERING

Highway engineering is a branch of civil engineering that involves the planning, design, construction, operation, and maintenance of roads, bridges, and tunnels to ensure safe and effective transportation of people and goods.

Standards of highway engineering are continuously being improved. Highway engineers must take into account future traffic flows, design of highway intersections/interchanges, geometric alignment and design, highway pavement materials, structural design of pavement thickness, and pavement maintenance. Highway engineers strive to predict and analyze all possible civil impacts of highway systems. Roads, bridges and tunnels must be safe, aesthetically pleasing, ecologically friendly and be adaptable to both modern and cultural-heritage environments.

Management of safety is a systematic process that strives to reduce the occurrence and severity of traffic accidents.

Technological advancements in highway engineering have improved the design, construction, and maintenance methods used over the years resulting in safety innovations.

1. What does highway engineering involve?
2. What should highway engineers take into account?
3. What are the main requirements to roads, bridges and tunnels?

Unit 1
Road Construction

Text 1
Road Construction Techniques

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: material, construction, process, excavator, excavation, compaction, standard, procedure, depression, index, deformation, bulldozer, tunnel, system;
b) прилагательные: organic, geographic;
c) глаголы: design, control.

ЗАДАНИЕ 2. Догадайтесь о значении выделенных слов в предложении.

1. He overcame all the **obstacles** on the way to his goal.
2. The number of **vehicles** on city roads is rising.
3. The cake has three **layers**.

4. The sculptor turns a **lump** of clay into a statue.
5. Be careful while skating. You can lose your **balance** and fall.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, какие работы выполняются во время дорожного строительства.

Образец: *Modern road construction involves <u>the removal of geographic obstacles</u>.*

1. Modern road construction involves …	a) excavation b) the removal of geographic obstacles c) digging and material removal d) the use of new construction materials e) filling
2. Earthwork involves …	f) deforestation g) compaction

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **embankment, n –** дорожная насыпь
2) **deforestation, n –** сведение (вырубка) леса
3) **pavement material –** материал дорожного покрытия
4) **drainage system –** дренажная (водоотводная) система
5) **earthwork, n –** земляные работы
6) **excavation, n –**выемка грунта
7) **roadbed, n –** земляное полотно
8) **bed, n –** зд. основание
9) **index of plasticity –** показатель пластичности грунта
10) **designed specifications –** проектные нормы (спецификации)
11) **binding agents –** вяжущие вещества
12) **road surface finish –** отделка дорожного покрытия
13) **recyclable materials –** перерабатываемые материалы

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Road Construction Techniques

Modern road construction involves the removal of geographic obstacles, and the use of new construction materials that are far more improved and durable. Rock and earth are removed by explosion or digging. Embankments, tunnels, and bridges are constructed, and then vegetation is removed by deforestation, if necessary. Finally, the pavement material is laid by using a range of road construction equipment.

Roadways are basically designed and constructed for use by vehicles and pedestrians. Drainage systems are constructed so that they should be able to carry waste water to a waterway, stream, river, or the sea.

Earthwork is one of the major works involved in road construction. This process includes excavation, material removal, filling, compaction, and construction. Moisture content is controlled, and compaction is done according to standard design procedures. Normally, rock explosion at the roadbed is not encouraged. While filling a depression to reach the road level, the original bed is flattened after the removal of the topsoil. The fill layer is distributed and compacted to the designed specifications. This procedure is repeated until the compaction desired is reached. The fill material should not contain organic elements, and possess a low index of plasticity. Fill material can include gravel and decomposed rocks of a particular size, but should not consist of huge clay lumps. Sand clay can be used. The area is considered to be adequately compacted when the roller movement does not create a noticeable deformation. The road surface finish is reliant on the economic aspects, and the estimated usage.

Bulldozers are some of the most important items of equipment used in road construction. Since a bulldozer is expensive, economic usage factors should be considered when using one. Bulldozers are extremely useful for road construction where it is possible to throw the waste excavated material on the road sides. Bulldozers may only be used if the slopes at the sides are not excessively steep. However, work on steep slopes can be accomplished by a bulldozer, by using special techniques and expertise.

Construction of roads in challenging conditions is no more a difficult task because the binding agents and admixtures make it possible for the roads to last long and carry the heavy loads without cracking under tough environmental conditions. Use of recyclable materials for the construction of roads adds balance to the environment too.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) профессиональное мастерство	a) excavation
2) выемка грунта	b) fillmaterial
3) верхний слой почвы	c) pedestrians
4) долговечные	d) decomposed rocks
5) сложные условия	e) explosion
6) разрушенная порода	f) durable
7) растительность	g) expertise
8) пешеходы	h) challenging conditions
9) взрывание	i) topsoil
10) материал для засыпки	j) vegetation

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. The pavement is laid …	a) where it is possible to throw the waste excavated material on the road sides.
2. Bulldozers are extremely useful for road construction …	b) by deforestation.
3. Rock and earth are removed …	c) on the economic aspects and the estimated usage.
4. Vegetation is removed …	d) by using a range of road construction equipment.
5. The road surface finish is reliant …	e) by explosion or digging.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Roadways are constructed for use … vehicles and pedestrians.
2. Moisture content is controlledaccording … standard design procedures.
3. Fill material includes gravel … a particular size.
4. Bulldozers are extremely useful … road construction.
5. Work … steep slopes can be accomplished by using special techniques and expertise.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите предложения.

1. Building materials used in modern road construction are…
   a) artificial and fire-resistant; b) more improved and durable.
2. Rock explosion at the roadbed …
   a) is not encouraged; b) is recommended.
3. Compaction is fully accomplished when …
   a) the roller does not create a noticeable deformation; b) the roller is fast and smooth.
4. It is possible for bulldozer to work on steep slopes if …
   a) it is big enough; b) special techniques and expertise are involved.
5. Construction of roads in challenging conditions is …
   a) no more a difficult task; b) no more an easy task.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Дорожные работы требуют устранения географических объектов, представляющих собой препятствия для строительства.

(Modern road construction involves the removal of geographic obstacles.Rock and earth are removed by explosion or digging. Embankments, tunnels, and bridges are constructed, and then vegetation is removed by deforestation.)

2. Процесс уплотнения производится в соответствии со стандартными процедурами проектирования.

(Compaction is done according to standard design procedures.The fill layer is distributed and compacted to the designed specifications. This procedure is repeated until the compaction desired is reached. The area is considered to be adequately compacted when the roller movement does not create a noticeable deformation.)

3. Бульдозеры можно использовать, если склоны по сторонам от дороги не чрезмерно крутые.

(Bulldozers may only be used if the slopes at the sides are not excessively steep.)

4. Использование перерабатываемых материалов в дорожном строительстве способствует сохранению экологического равновесия.

(Use of recyclable materials for the construction of roads adds balance to the environment.)

5. Земляные работы являются одними из основных в дорожном строительстве.

(Earthwork is one of the major works involved in road construction.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

The first step in building a **r**… is to remove **g**… obstacles. **E**… is an important part of the process of construction. It includes excavation, material removal, filling, **c**…, and construction. After the roadbed has been completed the **p**… is laid. The road surface **f**… is chosen taking into account the economic aspects, and the estimated usage.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What's special about new road construction materials? (new construction materials; far more improved and durable)
2. What are roads designed and constructed for? (roadways; designed and constructed; for use by vehicles and pedestrians)
3. Where do drainage systems of roads carry waste water to? (drainage systems; carry; waste water; to a waterway, stream, river, or the sea)
4. What does earthwork process include? (earthwork process; includes excavation, material removal, filling, compaction, and construction)
5. Are bulldozers extremely useful for road construction?(bulldozers; to throw the waste excavated material on the road sides)
6. Why is not construction of roads in challenging conditions a difficult task anymore? (the binding agents and admixtures; to last long; carry the heavy loads without cracking; tough environmental conditions.)
7. Does use of recyclable materials for the construction of roads add balance to the environment? (use of recyclable materials;adds balance to the environment)

ЗАДАНИЕ 13. Расскажите о дорожном строительстве по следующему плану, используя слова, данные в скобках.

1. The sequence of works in road construction (the removal of geographic obstacles, rock, earth, explosion, digging, embankments, tunnels, bridges, vegetation, deforestation, the pavement material).
2. The purpose of roadways and drainage systems (designed, constructed, vehicles, pedestrians, carry, waste water, waterway, stream, river, sea).
3. Earthwork is one of the major road construction works (excavation, material removal, filling, compaction, standard design procedures, depression, road level, flatten, topsoil, fill material, gravel, decomposed rocks).
4. Bulldozers are extremely useful for road construction (items of equipment, expensive, economic usage factors, slopes, excessively steep).
5. Present-day binding agents and admixtures make roads strong and durable (challenging conditions, binding agents, admixtures, last long and carry the heavy loads, cracking, tough environmental conditions).

Text 2

Comparison between Flexible and Rigid Pavement in Highway Construction

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: factor, function, asphalt, structure, type, intensity, stress, platform, restoration;
b) прилагательные: hydraulic, bituminous;
c) глаголы: design, analyze, finish.

ЗАДАНИЕ 2. Догадайтесь о значении выделенных слов в предложении.

1. The plane has made a **smooth** landing.
2. Cars are the main source of **pollution** in the city.
3. Plasticine is a **flexible** material**.**
4. Truth and oil always come to the **surface**.
5. There were wooden cupboards with oak **finish** in the kitchen.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, из каких материалов состоят жесткие и нежесткие дорожные покрытия.

Образец: *A flexible pavement structure is composed of materials laid on top.*

1. A flexible pavement structure is composed of …	a) materials laid on top. b) better quality materials. c) materials laid at the bottom. d) several layers of material.
2. A rigid pavement structure is composed of …	e) lower quality materials.

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **finish, v –** отделывать
2) **impact, n –** воздействие
3) **pollution, n –** загрязнение (окружающей среды)
4) **load distribution –** распределение нагрузки
5) **storm water drainage –** ливневая канализация
6) **concern –** зд. проблема, на которую направлено основное внимание
7) **flexible pavement –** дорожная одежда нежесткая
8) **bituminous –** битумный
9) **bend, v –** прогибаться
10) **deflect, v –** прогибаться
11) **maintenance, n –**уход
12) **restoration, n –** восстановление, ремонт
13) **underlying base course –** подстилающийслой
14) **subbase –** нижний слой
15) **structural support –** структурная поддержка
16) **rigid pavement –** дорожная одежда жесткая
17) **basecourse –** слой основания дорожной одежды
18) **orders of magnitude less rigid –** напорядкименеежесткий
19) **modulus of elasticity –** модульупругости
20) **reinforcing steel –** арматурнаясталь
21) **thermal stress –** температурное напряжение

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Comparison between Flexible and Rigid Pavement in Highway Construction

Pavement is finished with a hard smooth surface. The smooth surface helps make them durable and able to withstand traffic and the environment. Road pavements decay over time due to the impact of traffic, particularly heavy vehicles and environmental factors such as weather pollution. One of the primary functions of the pavement is load distribution.

Pavements are primarily to be used by vehicles and pedestrians. Storm water drainage and environmental conditions are a major concern in the designing of a pavement.

Flexible pavements are those which are surfaced with bituminous or asphalt materials. It is flexible since the total pavement structure bends or deflects due to the traffic loads. Generally, this type of pavement requires some sort of maintenance or restoration every 10 to 15 years.

A flexible pavement structure is typically composed of several layers of material. The layers consist of better quality materials laid on top where the intensity of stress from traffic loads is high and lower quality materials laid at the bottom where the stress intensity is low. Flexible pavements can be analyzed as a multilayer system under loading. A typical flexible pavement structure consists of the surface course and underlying base and sub base courses. Each of these layers contributes to structural support and drainage.

A rigid pavement structure is composed of a hydraulic cement concrete surface course and concealed base and sub base courses. The surface course is the rigid layer and provides the strength. The base or sub base layers are orders of magnitude less rigid than the Plain Cement Concrete surface but still make important contributions to pavement drainage and frost protection. They provide a working platform for construction equipment.

Rigid pavements are substantially harder than flexible pavements due to the high modulus of elasticity of the PCC – Plain Cement Concrete material, resulting in very low deflections under loading. Rigid pavements can have reinforcing steel, which is generally used to handle thermal stresses, to reduce or eliminate joints and maintain tight crack widths.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) покрыты битумными материалами	a) surfaced with bituminous materials
2) основные функции	b) decay overtime
3) гладкая поверхность	c) make important contributions
4) разрушаются со временем	d) joints
5) противостоять нагрузкам транспорта и природным факторам	e) to withstand traffic and the environment
6) проблема, на которую направлено основное внимание	f) equipment
7) поверхностный слой	g) smooth surface
8) способствует в значительной степени	h) surface course
9) оборудование	i) a major concern
10) стыки	j) primary functions

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Road pavements decay over time due to …	a) bend or deflect under the traffic loads.
2. Flexible pavements are those which …	b) the high modulus of elasticity of the PCC material.
3. Rigid pavements are hard due to …	c) the impact of traffic and environmental factors.
4. The main function of the pavement is …	d) the intensity of stress from traffic loads is high.
5. Better quality materials are laid on top where …	e) load distribution.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Pavement is finished … a hard smooth surface.
2. Road pavements decay … time due to the impact of traffic.
3. A flexible pavement structure is composed … several layers.
4. Flexible pavement structure bends or deflects due … the traffic loads.
5. The base or sub base layers provide a working platform … construction equipment.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите предложения.

1. In the designing of a pavementa major concern is…
   a) heavy vehicles and pedestrians; b) storm water drainage and environmental conditions.
2. In aflexible pavement structurethe quality materials are laid on top where …
   a) the stress intensity from traffic loads is low; b) the intensity of stress from traffic loads is high.
3. In a flexible pavement the lower quality materials are laid at the bottom where …
   a) the stress intensity from traffic loads is low; b) the intensity of stress from traffic loads is high.
4. A rigid pavement structure is composed of …
   a) underlying base and sub base courses; b) concealed base and sub base courses.
5. Flexible pavements can be analyzed as …
   a) a multilayer system under loading; b) an one-layer system under loading.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. С течением времени дорожные покрытия разрушаются.
   (Road pavements decay over time due to the impact of traffic, particularly heavy vehicles and environmental factors such as weather pollution.)
2. Дорожные покрытия нежесткие прогибаются под воздействием нагрузок транспорта.
   (Flexible pavements bend or deflect due to the traffic loads.)
3. Дорожные покрытия жесткие гораздо тверже нежестких дорожных покрытий.
   (Rigid pavements are substantially harder than flexible pavements due to the high modulus of elasticity of the PCC – Plain Cement Concrete material, resulting in very low deflections under loading.)
4. Дорожное покрытие нежесткое обычно состоит из нескольких слоев материала.
   (A flexible pavement structure is typically composed of several layers of material. It consists of the surface course and underlying base and sub base courses.)
5. Поверхностный слой – это жесткий слой, который обеспечивает прочность.
   (The surface course is the rigid layer and provides the strength.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

The hard smooth **s**… makes road **p**… durable and able to withstand **t**… and environment. There are flexible pavements and **r**… pavements. **F**… pavement structures **b**… or deflect due to the **t**… loads. **R**… pavements are characterized by very **l**… deflections under loading. Rigid pavements can have reinforcing **s**… .

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Why is the pavement finished with a hard smooth surface? (the smooth surface; make them durable; able to withstand traffic; the environment)
2. What is the primary function of the pavement? (one of the primary functions; load distribution)
3. What are flexible pavements? (flexible pavements; are surfaced; bituminous or asphalt materials)
4. Which courses does a typical flexible pavement structure consist of? (a flexible pavement structure; consists of; the surface course; underlying base and sub base courses)
5. What are rigid pavements? (rigid pavements; are characterized; with very low deflections under loading)

6. Which courses does a rigid pavement structure consist of? (a rigid pavement structure; is composed of; a hydraulic cement concrete surface course; concealed base and sub base courses)
7. Are rigid pavements substantially harder than flexible pavements? (rigid pavements; substantially harder; flexible pavements)

ЗАДАНИЕ 13. Расскажите о жестком и гибком типах дорожного покрытия по следующему плану, используя слова, данные в скобках.

1. The pavement finish and the factors that cause its decay (hard, smooth, surface, durable, withstand, traffic and the environment, decay, over time, impact of traffic, heavy vehicles, environmental factors, weather, pollution).
2. The primary function and the purpose of the pavement (designed, constructed, vehicles, pedestrians, carry, waste water, waterway, stream, river, sea)
3. Flexible pavements as multilayer structures under loading (flexible pavements, bend, deflect, traffic loads, several layers, surface course, underlying base course, sub base course).
4. Rigid pavements consist of several layers (structure, hydraulic cement concrete surface course, concealed, basecourse, sub base course).
5. Rigid pavements are harder than flexible pavements (rigid, flexible, pavements, harder, high modulus of elasticity, Plain Cement Concrete material, low deflections, under loading).

Тексты для самостоятельной работы по теме «Road Construction»

Text A

Прочитайте текст и выполните задание

Road Ecology

Road ecology is the study of the ecological effects (both positive and negative) of roads and highways. These effects may include local effects, such as noise, water pollution, habitat destruction/disturbance and local air quality; and wider effects such as habitat fragmentation, ecosystem degradation, and climate change from vehicle emissions.

Road noise can be a nuisance if it impinges on population centres, especially for roads at higher operating speeds, near intersections and on uphill sections. Noise health effects can be expected in such locations from road systems used by large numbers of motor vehicles. New roads can divert traffic away from population centres thus relieving the noise pollution.

Noise pollution is a factor of environmental degradation that is often overlooked and typically seen as not having a significant effect though traffic noise can contribute to numerous disturbances for wildlife.

Air pollution from fossil (and some biofuel) powered vehicles can occur wherever vehicles are used in congested city street conditions and other low speed circumstances. Concentrations of air pollutants and adverse respiratory health effects are greater near the road than at some distance away from the road. Road dust kicked up by vehicles may trigger allergic reactions.

The construction of new roads that divert traffic from built-up areas can deliver improved air quality to the areas relieved of a significant amount of traffic.

Urban runoff from roads and other impervious surfaces is a major source of water pollution. Rainwater and snow melt running off roads tend to pick up gasoline, motor oil, heavy metals, trash and other pollutants. De-icing chemicals and sand can run off into roadsides, contaminate groundwater and pollute surface waters.

Roads can act as barriers or filters to animal movement and lead to **habitat fragmentation.** Many species will not cross the open space created by a road due to the threat of predation. Roads also cause increased animal mortality from traffic. Those who drive on forest road should maintain speed limits and be vigilant.

WRITING TASK

Напишите эссе на английском языке на тему “Your Attitude to Road Ecology Problems”.

“What Can Road-building Engineers Do to Protect the Environment?”

Text B

Прочитайте текст и выполните задание

Roads in the United Kingdom

The United Kingdom has a network of roads, of varied quality and capacity, totalling about 262,300 miles (422,100 km).

Numbered roads in the UK are signed as M (Motorway) and A or B roads (legal "classification" varies between countries). There are various categories of more minor roads. For internal purposes, local authorities may also use C, D and U (the letter standing for "Unclassified"). The use of C and U numbers on signs is unusual but examples can be found in all four countries in the UK. Each road is given a number which is combined with the prefix, for example M40, A40 and B1110, although their informal or traditional names may still be used or heard occasionally: for instance, the Great North Road (now part of the A1) and the Great Cambridge Road (modern A10). The numbers follow a zonal system. A unified numbering system is in place for Great Britain, while there is no available explanation for the allocation of road numbers in Northern Ireland.

The majority of the major inter-urban routes are motorways which are designed to carry long distance traffic. The next category is the A roads, connecting large cities and towns.

Signage on the UK network conforms broadly to European norms, though a number of signs are unique to Britain. All length distances are shown in miles or yards, speed is in miles per hour whilst height and width restrictions are required to be shown in feet and inches.

Signs may be of an informative, warning or instructional nature. Instructional signs are generally circular, warnings are triangular and informative signs are rectangular or square. Motorway informative signs use white text on a blue background, primary routes are indicated by green, directional and distance signs with yellow text, whilst secondary roads use black text on a white background.

In the UK, road safety policy is part of transport policy, the basic principle of which is that "people travel safely and feel secure whether they are on foot or bicycle, in a car, on a train, or bus, at sea or on a plane". To control vehicle speeds roads are equipped with automated traffic cameras.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Signage on the Russian Federation Highway Network».

Unit 2
Bridges and Tunnels

Text 1
Bridge Construction

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: structure, design, function, nature (natural), material, temperature, asphalt, type, construction, mobility, project, test, computer, photography, model, method;
b) прилагательные: specific, technical, aesthetic, normal, special, horizontal, vertical, local, physical;
c) глаголы: to categorize.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. The bridge is a structure built to provide **passage** over the obstacle.
2. Yesterday it was cold; today it is +30 degrees. The temperature has **changed** greatly.
3. The roadway is for the cars and the pavement is for the **pedestrians.**
4. Bridge construction is an **expensive** project which requires a lot of money.
5. There are many methods and you should **choose** the right one.

ЗАДАНИЕ 3. Познакомьтесь со словами и словосочетаниями, которые помогут понять текст:

1) **to span** – охватывать, простираться
2) **obstacle** – препятствие
3) **terrain** – местность, ландшафт
4) **to support** – поддерживать
5) **weight** – вес
6) **beam** – балочный
7) **arch** – арочный
8) **cantilever** – консольный
9) **truss** – ферменный
10) **suspension** – подвесной
11) **pavement** – тротуар
12) **movable** – подвижный
13) **soil – почва**
14) **to endure** – выдерживать
15) **scale** – масштаб

ЗАДАНИЕ 4. Прочитайте и переведите текст.

Bridge Construction

The bridge is a structure built to span a valley, road, body of water, or other physical obstacle for the purpose of providing passage over the obstacle. Designs of bridges vary depending on the function of the bridge, the nature of the terrain where the bridge is constructed and the material used.

The bridge must be strong enough to support its own weight as well as the weight of the people and vehicles that use it. It also must resist natural disasters, including earthquakes, strong winds, and changes in temperature. Most modern bridges have an asphalt or concrete roadway.

Bridges can be categorized according to:

- the type of the construction – beam, arch, truss, cantilever, and suspension bridges;
- their use, like road and rail bridge, pedestrian pavement;
- the material to be used like steel or concrete,
- the mobility – fixed or moveable.

Construction of the foundations is the first step toward building a bridge. The type of bridge foundation has to be selected for specific soil strata, and is basically designed in accordance with the technical requirements and aesthetic reasons.

A bridge is designed to endure the normal vehicle loads, and other forces created due to winds and earthquakes. Therefore, special reinforcement may be necessary for prevention against high speed winds and earthquakes.

Since bridge construction is an expensive project, it is essential to conduct tests prior to the actual construction. Computer design and testing, photography and study of the air movement pattern over the model must be used to assist in the bridge design and reveal the bridge behavior under different dynamic loads.

The principle factors when choosing a suitable method of construction are following:

1. The scale of the bridge.
2. The obstacles to be crossed.
3. The regularity of the span lengths.
4. The horizontal and vertical profiles of the bridge decks.
5. The nature of the soil strata.
6. The local weather.
7. The local cost of materials.
8. The local labour markets.
9. The accessibility of the site.
10. The time allowed for construction.

ЗАДАНИЕ 5. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

водный массив, обеспечить проезд, выдерживать стихийные бедствия, рельсовый мост, слой почвы, нормальные транспортные нагрузки, укрепление, землетрясение, проводить испытания, обнаружить поведение моста, рынки труда, доступность, отведенное время.

ЗАДАНИЕ 6. Соедините части предложений по смыслу.

1. The bridge is a structure …	a) the principle factors.
2. The bridge must …	b) the type of the construction, use, material, mobility.
3. Bridges can be categorized according to …	c) to provide passage over the obstacle.
4. Special reinforcement may be necessary for …	d) prevention against high speed winds and earthquakes.
5. Choosing a suitable method of construction follow …	e) support its own weight, the weight of the people and vehicles that use it.

ЗАДАНИЕ 7. Вставьте необходимые предлоги.

1. Designs … bridges vary depending on the function of the bridge.
2. The type of bridge foundation has to be selected … specific soil strata.
3. A bridge is designed to endure forces created … winds and earthquakes.

4. Special reinforcement may be necessary … prevention against high speed winds and earthquakes.
5. Computer design and testing must be used to reveal the bridge behavior … different dynamic loads.

ЗАДАНИЕ 8. Ответьте на вопросы об особенностях строительства мостовых конструкций.

1. What is the purpose of the bridge?
2. How strong should it be?
3. How are bridges categorized?
4. What is the first step in bridge construction?
5. Why is special reinforcement necessary?
6. What assists in the bridge design?
7. Can you name the principle factors when choosing a suitable method of construction?

ЗАДАНИЕ 9. Подтвердите словами из текста, что:

1. На дизайн мостов влияют разные обстоятельства (function of the bridge, the nature of the terrain, the material).
2. Мост должен выдерживать многочисленные нагрузки (its own weight, people, vehicles, natural disasters).
3. Тип основания моста выбирают, исходя из разных факторов (soil strata, the technical requirements, aesthetic reasons).
4. Перед началом строительства моста проводятся предварительные тестирования (computer design and testing, photography and study of the air movement).
5. При выборе метода строительства необходимо учитывать различные факторы (the scale, the obstacles, span lengths, the nature of the soil strata, the local weather, cost of materials, labour markets, the accessibility of the site, the time allowed).

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите следующие предложения.

1. The bridge is a structure …
   a) to provide passage over the obstacle; b) to connect obstacles.
2. Most modern bridges have …
   a) a timber roadway; b) an asphalt or concrete roadway.
3. A bridge is designed to endure …
   a) normal vehicle loads and natural forces; b) the obstacles.

4. Tests reveal …
   a) the obstacles to be crossed; b) the bridge behavior under different dynamic loads.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

The bridge is a structure built to **s…** a valley, road, body of water, or other physical obstacle. Designs of bridges depend on the function of the bridge, the nature of the **t…** and the material used. The bridge **s…** its own weight, the weight of the people and vehicles and r**…** natural disasters. Bridges can be categorized according tothe type of the **c…**, their use, the material and the **m…** . The type of bridge foundation has to be selected for specific **s...** . Special reinforcement may be necessary for **p…** against high speed winds and earthquakes. It is essential to conduct **t…** to **r…** the bridge behaviour under different dynamic loads. When choosing a suitable method of construction you should consider the principle **f…** .

ЗАДАНИЕ 12. Расскажите об основах мостостроения по следующему плану, используя слова, данные в скобках.

1. The purpose of the bridge and its characteristics (passage, obstacle).
2. The classification of the bridges (type, use, material, mobility).
3. The steps of the bridge construction (foundation, reinforcement, testing).
4. The principle factors influencing the method of construction (scale, obstacles, profiles, soil strata, weather, materials, labour market, accessibility of the site, time for construction).

Text 2
Basic Tunneling System

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: system, tunnel, machine, type, method, section, risk, reservoir, gas, analysis, location, condition, factor, phase, corrosion, control;
b) прилагательные: gigantic, natural, geologic, special.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Thorough geologic analysis is important **to assess** the risks of different locations.
2. Key factors **include** soil and rock types, the behaviour of the rock mass; size of rock, groundwater and special hazards.

3. The tunneling system is needed in **support** to prevent rock fall.
4. The support must be installed after **excavation**.
5. Ventilation is vital **to provide** fresh air and to remove explosive gases.

ЗАДАНИЕ 3. Познакомьтесь со словами и словосочетаниями, которые помогут понять текст:

1) **highway** – шоссе
2) **railroad** – железная дорога
3) **pipeline** – трубопровод
4) **to dig (dug, dug)** – копать
5) **tunnel-boring** – тоннельно-бурильный
6) **trench** – котлован, траншея
7) **shallow** – мелкий
8) **deep** – глубокий
9) **blasting** – взрывные работы
10) **trapped** – в ловушке
11) **rock** – скалистая горная порода
12) **drilling** – бурение, сверление

ЗАДАНИЕ 4. Прочитайте и переведите текст.

Basic Tunneling System

Tunnels are long underground passageways that carry highways, railroads, and pipelines under mountains, seas, and rivers. Gigantic tunnel-boring machines make tunneling both quicker and safer.

Various types of tunnels are used in different types of terrains. Shallow tunnels are often dug by the "cut-and-cover" method, which involves excavating a long trench with reinforced sides, roof, and floor and then covering the whole thing over with spoil (the original excavated material). Where shallow cut-and-cover tunnels are not possible, deep tunnels must be bored using drills, explosives, or boring machines.

Digging a tunnel can be difficult and dangerous. It includes the risk of earth collapsing, water pouring into the tunnel from natural underground water reservoirs, dust from blasting, trapped gas, and the heat and humidity of working deep under the Earth’s surface.

Thorough geologic analysis is essential in order to assess the risks of different locations and to reduce the pouring of ground water. Key factors include soil and rock types, the behaviour of the rock; size of rock, ground water and special hazards, such as heat, gas, and earthquake risk.

Excavation of the ground within the tunnel involves drilling, loading explosive, blasting, ventilating fumes, and excavation of the blasted rock.

The dominant factor in all phases of the tunneling system is the support needed to prevent rock fall. Engineers must consider the type of support, its strength, and how soon it must be installed after excavation. Steel is widely used as the first temporary stage or primary support. For protection against corrosion it is encased in concrete.

In all tunnels control of the environment is essential to provide safe working conditions. Ventilation is vital, both to provide fresh air and to remove explosive gases such as methane.

ЗАДАНИЕ 5. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

подземные переходы, местности, метод «срезки и покрытия», вырытый грунт, обрушение земли, бурильные машины, высокая температура и влажность, загрузка взрывчатки, выемка взорванной горной породы, предотвратить обвал горной породы, временный этап, контроль за окружающей средой, обеспечить, удалить взрывчатые газы.

ЗАДАНИЕ 6. Соедините части предложений по смыслу.

1. Gigantic tunnel-boring machines make tunneling …	a) dust from blasting.
2. The "cut-and-cover" method involves …	b) excavating a long trench.
3. Deep tunnels must be bored …	c) quicker and safer.
4. Digging a tunnel includes …	d) using drills, explosives, or boring machines.
5. Steel is widely used as …	e) primary support.

ЗАДАНИЕ 7. Вставьте необходимые предлоги.

1. Various types of tunnels are used in different types … terrains.
2. Shallow tunnels are often dug … the "cut-and-cover" method.
3. Thorough geologic analysis is essential … to assess the risks of different locations.
4. The dominant factor … all phases of the tunneling system is the support.
5. For protection … corrosion steel is encased in concrete.

ЗАДАНИЕ 8. Ответьте на вопросы об особенностях тоннельного строительства.

1. What are tunnels?
2. How are shallow tunnels dug?

3. Is digging a tunnel dangerous and why?
4. What does geologic analysis provide?
5. Blasting is involved in excavation of the ground, isn't it?
6. The support is needed to decorate the tunnel, isn't it?
7. Why is control of the environment essential?

ЗАДАНИЕ 9. Подтвердите словами из текста, что:

1. Выемка мелких тоннелей включает в себя два этапа (excavating, covering).
2. При прокладывании глубоких тоннелей используется техника (drills, explosives, boring machines).
3. Прокладывание тоннелей может быть опасным (collapsing, water pouring, dust, trapped gas, the heat and humidity).
4. Геологические изыскания очень важны (to assess the risks).
5. Поддержка тоннелей является первостепенным фактором (to prevent rock fall).
6. Вентиляция жизненно необходима (to provide fresh air, to remove explosive gases).

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите следующие предложения.

1. Gigantic tunnel-boring machines make tunneling…
   a) more beautiful; b) quicker and safer.
2. Deep tunnels must be bored…
   a) bored using drills, explosives, or boring machines; b) entirely by hand.
3. The support is necessary…
   a) to provide fresh air; b) to prevent rock fall.
4. … is widely used as primary support.
   a) Timber; b) Steel.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Tunnels are long underground **p…** that carry highways, railroads, and pipelines under mountains, seas, and rivers. Various types of tunnels are used in different types of **t…** . Where **s…**cut-and-cover tunnels are not possible, **d…** tunnels must be bored. Digging a tunnel includes the risk of earth **c…**, water **p…**, dust from **b…**, **t…** gas, and the **h…** and **h…** of working deeply. **G…** analysis helps to assess the risks, the behaviour of the rock, ground water and special hazards. To prevent rock fall engineers consider the type of **s…,** its strength, and how soon it must be installed after excavation. Control of the environment is necessary to provide safe **w…** conditions. **V…** provides fresh air and to removes explosive gases.

ЗАДАНИЕ 12. Расскажите об особенностях тоннелестроения по следующему плану, используя слова, данные в скобках.

1. Types of tunnels (passageways, tunnel-boring machines, shallow, deep).
2. Difficulties in digging a tunnel (collapsing, pouring, dust, trapped gas, heat, humidity).
3. The need of geologic analysis (to assess the risks, to reduce the pouring of ground water, the behaviour of the rock, special hazards).
4. The process of excavation (drilling, loading explosive, blasting, ventilating fumes, excavation of the blasted rock).
5. The support and the ventilation are important stages in tunneling system (to prevent rock fall, to provide fresh air and to remove explosive gases).

Тексты для самостоятельной работы по теме “Bridges and Tunnels”

Text A

Прочитайте текст и выполните задание.

Why Do Bridges Collapse?

Bridges don't fail very often, but when they do, they always collapse for exactly the same reason: something happens that makes them unable to balance the forces acting on them. A force becomes too great for one of the components in the bridge, which immediately fails. Sooner or later, another component fails, then another – and so the bridge collapses in a kind of domino effect of failing materials.

There are two different ways in which a bridge component can fail catastrophically: weakness and fatigue. First, and simplest, it might be too weak to cope with a sudden transient load. If a bridge is designed to carry no more than 100 cars, but 200 heavy trucks drive onto it instead, that creates a dangerous, transient load. Or if hurricane-force winds buffet the bridge, twisting the deck much more than it's designed to cope with, that can be catastrophic too. So a bridge can fail through weakness because a force exceeds what's called the ultimate tensile strength or compressive strength of the materials from which it's constructed.

But a bridge can also fail even if the forces on it are relatively modest and well within these limits. Everyday materials usually have to undergo repeated stresses and strains. The endless cycles of stress and strain, flexing and relaxing, can cause materials to weaken over time through a process known as fatigue. Fatigue is often compounded by gradual corrosion.

Engineers try to protect against bridge failures in two main ways. It's easy to understand that they need regular maintenance. Periodic inspections and preventative maintenance helps us spot problems and correct them before it's too late. Engineers

can also protect against bridge failure by building in a factor of safety – designing them so they can cope with forces several times larger than they're ever likely to encounter.

WRITING TASK

1. Напишите эссе на английском языке об особенностях строительства и эксплуатации мостов, используя известный вам материал.
2. Подготовьте презентацию на английском языке об основных причинах разрушения мостовых конструкций.

Text B

Прочитайте текст и выполните задание.

Tunnel Construction Techniques

A tunnel construction is an underground passage provided beneath earth surface or water. They can be used for roadways, railways, waterways or underground metro rail networks.

There are different methods of tunnel construction.

Cut and Cover Method of Tunnel Construction

This method is generally used to build shallow tunnels. In this method, a trench is cut in the soil and it is covered by some support which can be capable of bearing load on it. Most of the Underground metro rail stations are constructed using cut and cover method.

Bored Tunnel Method

This method is a modern technology. In this case, tunnel boring machines are used which automatically work and makes the entire tunneling process easier. It is aquicker process and is used to build tunnels in high traffic areas.

Clay Kicking Method of Tunnel Construction

This method is used for strong clayey soil conditions. It is an old method and used for small works like sewage pipes installations etc. In this method, a hole is excavated into the ground and after some depth tunnel is excavated.

Shaft Method of Tunnel Construction

In this method tunnel is constructed at greater depth from the ground surface. The shaft is built up to the depth where tunnel is required. After the construction process, these shafts can also be used for ventilation purpose as well as emergency exits.

Pipe Jacking Method of Tunnel Construction

Pipe jacking method is used to construct tunnels under existing structures like road ways, railways etc. In this method, specially made pipes are driven into underground using hydraulic jacks. Maximum size of 3.2-meter diameter is allowed for tunnels.

Box Jacking Method of Tunnel Construction

Box jacking method is similar to pipe jacking, but in this case instead of pipes, specially made boxes are driven into the soil. Excavated matter is collected within the box. Larger size tunnels can be excavated using box jacks up to 20 meters.

Underwater Tunnel Construction

An underwater tunnel is a structure which is built under water to make a way through it. If construction of bridge is not possible then under water tunnel is good choice. Under water tunneling is costly process but have advantages over bridge or ferry links.

WRITING TASK

1. Напишите эссе на английском языке о наиболее известных и распространенных методах строительства тоннельных конструкций.
2. Подготовьте презентацию на английском языке об особенностях возведения тоннельных конструкций.

Unit 3
Mechanical Engineering

Text 1
History of Mechanical Engineering

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: engineering, mechanics, tradition, seismometer, device, physics, mechanism, revolution, institution, mathematics, polytechnic, university, inventor;
b) прилагательные: mechanical, historical, structural, dynamic, medieval, industrial, mathematical, cooling, strong, differential;
c) глаголы: invent, involve, base, create, incorporate.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. In ancient Greece the works of Archimedes influenced mechanics in the Western tradition and Heron of Alexandria created the first **steam engine**.
2. During the 17th century, important **breakthroughs** in the foundations of mechanical engineering occurred in England.
3. They brought with them manufacturing machines and the engines to **power** them.
4. During the early 19th century industrial revolution, machine **tools** were developed in England, Germany and Scotland.

5. Education in mechanical engineering has historically been based on a strong **foundation** in mathematics and science.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, где инженеры-механики применяют свое оборудование.

Образец: *Mechanical engineers use tools in heating and cooling systems.*

Mechanical engineers use tools in…	a) building houses b) heating and cooling systems c) digging excavations d) transport systems e) medicine f) watercraft g) machinery

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **archives -** архивы
2) **application** – применение
3) **steam engine** – паровой двигатель
4) **chariot –** транспортное средство
5) **incorporate** – встраивать, помещать
6) **seismometer** – сейсмометр
7) **differential gears** – дифференциальные передачи
8) **escapement mechanism** – механизм спуска
9) **power-transmitting chain drive** – цепной привод
10) **medieval** - средневековый
11) **inventor** – изобретатель
12) **crankshaft** – коленчатый вал
13) **camshaft** – распределительный вал
14) **breakthrough** – прорыв
15) **Laws of Motion** – законы динамики
16) **mathematical basis** – математическая основа
17) **machinetool** - станок

ЗАДАНИЕ 5. Прочитайте и переведите текст.

History of Mechanical Engineering

The application of mechanical engineering can be found in the archives of various ancient and medieval societies. In ancient Greece the works of Archimedes

influenced mechanics in the Western tradition and Heron of Alexandria created the first steam engine. In China Zhang Heng improved a water clock and invented a seismometer, and Ma Jun invented a chariot with differential gears. The medieval Chinese engineer Su Song incorporated an escapement mechanism into his astronomical clock tower two centuries before escapement devices were found in medieval European clocks. He also invented the world's first known endless power-transmitting chain drive.

During the Islamic Golden Age (7th to 15th century), Muslim inventors made remarkable contributions in the field of mechanical technology. Al-Jazari, who was one of them, wrote his famous *Book of Knowledge of Ingenious Mechanical Devices* in 1206 and presented many mechanical designs. Al-Jazari is also the first known person to create devices such as the crankshaft and camshaft, which now form the basics of many mechanisms.

During the 17th century, important breakthroughs in the foundations of mechanical engineering occurred in England. Isaac Newton formulated Laws of Motion and developed Calculus, the mathematical basis of physics. Newton was reluctant to publish his works for years, but he was finally persuaded to do it by his colleague Edmond Halley. Wilhelm Leibniz was also credited with creating Calculus during this time period.

During the early 19th century industrial revolution, machine tools were developed in England, Germany and Scotland. This allowed mechanical engineering to develop as a separate field within engineering. They brought with them manufacturing machines and the engines to power them.

The first schools in the United States to offer an engineering education were the United States Military Academy in 1817, an institution now known as Norwich University in 1819, and Rensselaer Polytechnic Institute in 1825. Education in mechanical engineering has historically been based on a strong foundation in mathematics and science.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) применение	a) separate field
2) паровой двигатель	b) chariot
3) публиковать	c) invented
4) механические конструкции	d) foundation
5) разработал	e) historically
6) отдельная область (сфера)	f) steam engine
7) фундамент	g) mechanical constructions
8) исторически	h) publish
9) временной период	i) findings
транспортное средство	j) time period

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Heron of Alexandria created …	a. occurred in England.
2. Su Song invented …	b. the United States Military Academy and Rensselaer Polytechnic Institute.
3. Al-Jazari presented many …	c. the first steam engine.
4. During the 17th century, important breakthroughs in the foundations of mechanical engineering …	d. mechanical designs.
5. The first schools in the United States to offer an engineering education were …	e. the world's first known endless power-transmitting chain drive.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. In ancient Greece the works … Archimedes influenced mechanics in the Western tradition.
2. The medieval Chinese engineer Su Song incorporated an escapement mechanism … his astronomical clock tower.
3. Al-Jazari is the first known person … create devices such as the crankshaft and camshaft.
4. Newton was reluctant … publish his works for years.
5. Wilhelm Leibniz was also credited … creating Calculus during this time period.
6. This allowed mechanical engineering … develop as a separate field within engineering.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. In China Zhang Heng improved a…
   a) water clock; b) Calculus.
2. Al-Jazari is also the first known person to create such device as…
   a) seismometer; b) crankshaft.
3. Isaac Newton formulated…
   a) Laws of Motion; b) law of statics of liquids and gases.
4. This allowed mechanical engineering to develop as a separate field within…
   a) philosophy; b) engineering.
5. Education in mechanical engineering has historically been based on a strong foundation in…
   a) mathematics; b) literature.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Способы применения машиностроения можно найти в архивах различных древних и средневековых обществ (ancient and medieval societies).
2. Во времена исламского золотого века мусульманские изобретатели внесли значительный вклад в область механических технологий (remarkable contributions).
3. Исаак Ньютон сформулировал законы динамики и разработал исчисление - математическую основу физики (Laws of Motion).
4. Во время промышленной революции начала 19-го века в Англии, Германии и Шотландии были разработаны станки (machinetools).
5. Образование в области машиностроения было основано на прочном фундаменте математики и естественных наук (mathematics and science).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

The **a**… of mechanical engineering can be found in the archives of various ancient and medieval **s**… . The medieval Chinese engineer Su Song incorporated an escapement **m**… into his astronomical clock tower two centuries before escapement devices were found in medieval European clocks During the Islamic Golden Age, Muslim **i**… made remarkable contributions in the field of mechanical **t**… .

During the 17th century, important **b**… in the foundations of mechanical engineering occurred in England. Isaac Newton formulated Laws of **M**…. Wilhelm Leibniz was also credited with creating **C**… during this time period.

During the early 19th century industrial **r**…, machine tools were **d**… in England, Germany and Scotland.

Education in mechanical engineering has historically been based on a strong foundation in **m**… and **s**… .

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Where can we find the application of mechanical engineering? (in the archives of various ancient and medieval societies)
2. Who invented a chariot with differential gears? (Ma Jun)
3. Who persuaded Newton to publish his works? (Edmond Halley)
4. What did Isaac Newton formulate? (Laws of Motion)
5. Wilhelm Leibniz was credited with creating Calculus during the 17th century, wasn`t he? (he was credited)
6. Has education in mechanical engineering been based on a foundation in mathematics or chemistry? (a foundation in mathematics)

ЗАДАНИЕ 13. Расскажите об истории машиностроения по следующему плану, используя слова, данные в скобках.

1. Developing of mechanical engineering in ancient Greece (ancient, Greece, mechanism)
2. Developing of mechanical engineering in ancient China (ancient, China, mechanism)
3. Developing of mechanical engineering in the Islamic Golden Age (Muslim, mechanical, crankshaft, camshaft)
4. Developing of mechanical engineering in Europe in the 17-19th centuries (breakthroughs, foundations, engineering, power)
5. The contribution of Isaac Newton in the development of mechanical engineering (Laws of Motion, publish works)
6. Engineering training in the United States of America in the 19th century (engineering, education, mathematics, science).

Text 2
The Most Powerful Road Construction Equipment

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: design, location, project, grader, tractor, component, information, contract, coordinator, methodology, construction, material, platform, excavator, factory;
b) прилагательные: industrial, physical, building, powerful, minor, fabric, compact;
c) глаголы: locate, place, require, involve, consist, move, increase.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Modern equipment used in road construction depends on whether a project involves building a new road, **re-carpeting** a road or just minor road repairs.
2. It is an **equipment** used to create flat surfaces for asphalt to be placed on.
3. Excavator consists of a boom, bucket and cab on a rotating platform located above an **undercarriage** with wheels or tracks.
4. A forklift was initially used for moving objects in factories but the **design** has been modified over the years to increase its uses.
5. Truck cranes are usually compact, fold up, and **require** negligible mounting space.

ЗАДАНИЕ 3. Используя выражения, данные справа, скажите, какое современное оборудование используется для строительства дорог.

Modern equipment used in road construction is…	a) surgery scalpel b) motor grader c) crawler excavator d) ram engine e) forklift truck f) truck crane g) road roller h) purline

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **modern equipment** - современное оборудование
2) **motor grader**- автогрейдер
3) **re-carpeting** – повторное дорожное покрытие
4) **locate** - располагаться
5) **crawler excavator** – гусеничный экскаватор
6) **capable** - способный
7) **axle** – ось
8) **engine** – двигатель
9) **excavating** – вскапывание, землеройные работы
10) **dump truck** – самосвал
11) **boom** – подъемник
12) **bucket**– ковш
13) **rotating platform** – вращающаяся платформа
14) **undercarriage** – ходовая часть
15) **forklift truck** – грузоподъемник
16) **pit** - карьер
17) **to scoop up** – выкапывать
18) **truck crane** – автокран
19) **construction site** – строительная площадка
20) **wheel loader –** фронтальный погрузчик
21) **negligible** – несущественный, маленький

ЗАДАНИЕ 5. Прочитайте и переведите текст.

The Most Powerful Road Construction Equipment

Modern equipment used in road construction depends on whether a project involves building a new road, re-carpeting a road or just minor road repairs. Here is a list of commonly used road construction equipment.

1. Motor Grader is commonly referred to as road grader or a maintainer. It is an equipment used to create flat surfaces for asphalt to be placed on. Common models consist of three axles, with the engine and cab located above the rear axles at the back end of the vehicle and a third axle at the front of the vehicle – with a long blade in between.

2. Crawler Excavator is a heavy construction equipment used for excavating earth and rocks and loading them onto a dump trucks. Excavator consists of a boom, bucket and cab on a rotating platform located above an undercarriage with wheels or tracks. They are capable of performing a wide range of work by changing front attachment.

3. Forklift Truck is a powered industrial vehicle with an attached prolonged platform that can be lowered to pick an object on or below the ground and raised to move the object. A forklift was initially used for moving objects in factories but the design has been modified over the years to increase its uses.

4. Wheel Loader is a type of tractor used to move a pile of material from the ground and load it onto a truck or into an open pit. It consists of a front-mounted square wide bucket joined to the end of two arms used to scoop up materials from the ground without spreading it out.

5. Truck Crane. These types of cranes are usually mounted on the back of a lorry to assist with lifting requirements within a construction site. They consist of the carrier (called the lower) and lifting component (called the upper), which are joined through a turntable allowing the lifting component to swing from side to side. Truck cranes are usually compact, fold up, and require negligible mounting space.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

1) повторное покрытие дороги	a) consist of
2) грузоподъёмник	b) require
3) зависеть	c) capable
4) ковш	d) negligible
5) состоять из	e) construction site
6) строительная площадка	f) re-carpeting
7) грузить	g) boom
8) малый, несущественный	h) scoop up
9) подъёмник	i) bucket

10) требовать	j) depend on
11) выкапывать	k) load
12) способный	l) forklift truck

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Here is a list of …	a) a heavy construction equipment used for excavating earth and rocks and loading them onto a dump trucks.
2. Crawler excavator is …	b) the carrier and lifting component commonly used road construction equipment.
3. Wheel loader is a type of tractor used to …	c) commonly used road construction equipment.
4. Truck crane consists of …	d) negligible mounting space.
5. Truck cranes require …	e) move a pile of material from the ground and load it onto a truck or into an open pit.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Here is a list … commonly used road construction equipment.
2. Motor grader is commonly referred … as road grader or a maintainer.
3. Excavator consists … a boom, bucket and cab on a rotating platform.
4. A forklift was initially used … moving objects in factories.
5. Wheel loader is a type of tractor used to move a pile of material … the ground and load it onto a truck.
6. Truck cranes consist … the carrier and lifting component.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Motor grader is commonly referred to as…
   a) wheel loader; b) road grader.
2. Excavator consists of a boom, bucket and…
   a) cab; b) axle.
3. A forklift was initially used for moving objects in…
   a) factories; b) building sites.
4. Wheel loader consists of a…
   a) three axles; b) front-mounted square wide bucket.
5. Truck crane consists of the carrier and…
   a) bucket; b) lifting component.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Современное оборудование, используемое в дорожном строительстве, зависит от того, предполагает ли проект строительство новой дороги, повторное покрытие дороги или просто мелкий ремонт дороги (*building a new road*).
2. Автогрейдер - это оборудование, используемое для создания плоских поверхностей для укладки асфальта (*flat surfaces*).
3. Экскаваторы способны выполнять широкий спектр работ путем замены переднего навесного оборудования (*wide range of work*).
4. Колесный погрузчик - это тип трактора, используемый для перемещения строительного материала с земли в грузовик (*load it onto a truck*).
5. Автокраны обычно компактны и требуют незначительного места для монтажа (*negligible mounting space*).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Modern equipment used in road construction depends on whether a **p**… involves building a new **r**…, re-carpeting a road or just minor road **r**… . Here is a list of commonly used road construction **e**… .

Motor grader is an equipment used to **c**… flat surfaces for asphalt to be **p**… on. Crawler excavator is a heavy **c**… equipment used for **e**… earth and rocks and loading them onto a dump **t**… . Forklift truck is a powered **i**… vehicle with an attached prolonged **p**… that can be lowered to pick an object on or below the **g**… and raised to move the object. Wheel loader is a type of **t**… used to move a pile of material from the ground and load it onto a **t**… or into an open pit. Truck cranes are usually **m**… on the back of a lorry to assist with lifting requirements within a **c**… site.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What does modern equipment used in road construction depend on? (a new road, re-carpeting a road)
2. What is motor grader? (to create flat surfaces)
3. Crawler excavator is a heavy construction equipment used for excavating earth and rocks and loading them onto a dump trucks, isn`t it? (construction equipment)
4. Was a forklift initially used for moving objects in factories or in construction sites? (in factories)
5. What does truck crane consist of? (the carrier, lifting component)
6. Are truck cranes usually compact or bulky? (compact)

ЗАДАНИЕ 13. Расскажите о дорожном строительном оборудовании по следующему плану, используя слова, данные в скобках.

1. A list of commonly used road construction equipment (motor grader, crawler excavator).
2. Motor grader components (axles, engine, cab, vehicle, blade).
3. Crawler excavator functions and components (boom, bucket, rotating platform, cab, front attachment).
4. Forklift assignment (objects, factories, design, increase, uses).
5. Wheel loader components (load, front-mounted, bucket, arms, scoop up).
6. Truck crane components (carrier, lifting component, turntable, swing).

Тексты для самостоятельной работы по теме «Mechanical Engineering»

Text A

Прочитайте текст и выполните задание.

Relevant Mechanical Engineering Jobs

According to the Bureau of Labour Statistics (BLS) "Mechanical engineers generally work in professional office settings. They may occasionally visit worksites where a problem or piece of equipment needs their personal attention. Mechanical engineers work mostly in engineering services, research and development, manufacturing industries, and the federal government".

For most jobs, mechanical engineers need at least a bachelor’s degree in engineering, and many employers, particularly those that offer engineering consulting services, also require certification as a Professional Engineer. A master's degree is often required for promotion to management, and ongoing education and training are needed to keep up with advances in technology, materials, computer hardware and software, and government regulations. Additionally, many mechanical engineers belong to the American Society of Mechanical Engineers.

According to Salary.com, as of July 2014 the salary range for a newly graduated mechanical engineer with a bachelor's degree is $52,626 to $74,524. The range for a mid-level engineer with a master's and five to 10 years of experience is $73,238 to $108,609; and the range for a senior engineer with a master's or doctorate and more than 15 years of experience is $95,251 to $141,806. Many experienced engineers with advanced degrees are promoted to management positions or start their own businesses where they can earn even more.

The field of mechanical engineering is expected to grow. The BLS states, "Employment of mechanical engineers is projected to grow 5 percent from 2012 to 2022, slower than the average for all occupations. Job prospects may be best for those

who stay abreast of the most recent advances in technology." Having good grades from a highly rated institution should give a job seeker an advantage over the competition.

WRITING TASK

Напишите эссе на английском языке на тему «Профессии в области машиностроения».

Text B

Прочитайте текст и выполните задание.

Screw Conveyor

A screw conveyor is a mechanism that uses a rotating helical screw blade, usually within a tube, to move liquid or granular materials. They are used in many bulk handling industries. Screw conveyors in modern industry are often used horizontally or at a slight incline as an efficient way to move semi-solid materials, including food waste, wood chips, aggregates, cereal grains, animal feed, boiler ash, municipal solid waste, and many others. The first type of screw conveyor was the Archimedes' screw, used since ancient times to pump irrigation water.

They usually consist of a trough or tube containing either a spiral blade coiled around a shaft, driven at one end and held at the other, or a "shaftless spiral", driven at one end and free at the other. The rate of volume transfer is proportional to the rotation rate of the shaft. In industrial control applications the device is often used as a variable rate feeder by varying the rotation rate of the shaft to deliver a measured rate or quantity of material into a process.

Screw conveyors can be operated with the flow of material inclined upward. When space allows, this is a very economical method of elevating and conveying. As the angle of inclination increases, the capacity of a given unit rapidly decreases.

Various applications of the screw conveyor include its use in snow blowers, to move snow towards an impeller, where it is thrown into the discharge chute. Combine harvesters use both enclosed and open augers to move the unthreshed crop into the threshing mechanism and to move the grain into and out of the machine's hopper. Ice resurfacers use augers to remove loose ice particles from the surface of the ice. An auger is also a central component of an injection molding machine. An auger is used in some rubbish compactors to push the rubbish into a lowered plate at one end for compaction.

Screw conveyors are also present in food processing. They are a tool of choice in powder processing, when it comes to convey or dose precisely bulk solids. In a conventional meat grinder, chunks of meat are led by the auger through a spinning blade and a holed plate. This method emulsifies the fat in beef to soften hamburger patties, and is also used to produce a wide variety of sausages and loaves.

Screw conveyors are also used in oil fields as a method of transporting rock cuttings away from the shakers to skips. Augers are also used in some types of pellet stove sand barbecue grills, to move fuel from a storage hopper into the firebox in a controlled manner. Augers are often used in machining, where in the machine tools may include an auger to direct the swarf (scrap metal or plastic) away from the work piece.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Винтовой конвейер».

PART V
ENGINEERING SYSTEMS AND CONSTRUCTIONS

All newly built houses are equipped with heating, ventilating, gas, cold and hot water supply units. A heating engineer works solely on heating and ventilation systems in domestic and commercial properties. He is a specialist in heating. His responsibility is to see that all these systems are kept in good order and are effectively working. A water supply engineer designs and supervises systems for water supply and water disposal, water purification and sewage treatment.

The professions of a fire prevention engineer and a safety engineer are very important because construction is one of the areas of employment where hazardous conditions are part of the everyday working environment.A safety engineer must minimizethe hazards to make the construction site safe. A fire prevention engineer must coordinate and ensure the fire safety from the planning stage of a new building. He provides fire warning systems and fire protection equipment and he is also responsible for means of escape if the fire occurs. Safety should balance with the requirements of modern construction.

1. What are all newly built houses equipped with?
2. What does a heating engineer do?
3. What are the responsibilities of a water supply engineer?
4. Why is the profession of a fire prevention engineer very important?
5. What are the duties of a safety and a fire prevention engineer?

Unit 1
Heating, Ventilation and Air Conditioning

Text 1
Types of Ventilation Systems

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: ventilation, method, strategy, system, energy, climate, type, structure, control, filters, energy, effectiveness;
b) прилагательные: natural, electric, uncontrollable, typical;
c) глаголы: install, localize, design.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. All of the fans, vents, and **ventilation equipment** in a home work together as a "ventilation system".
2. Supply ventilation systems are **relatively** simple and **inexpensive**to install.
3. A typical balanced ventilation system is designed to **supply** fresh air to rooms where people spend the most time.
4. Balanced ventilation systems are **appropriate** for all climates.
5. Energy recovery ventilation systems operated in cold climates must have **devices** to help prevent freezing and frost formation.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, расскажите о природной (естественной) и искусственной вентиляции.

Образец*: Natural ventilation is unreliable to ventilate a house uniformly.*

1. Natural ventilation …	a) is unpredictable and uncontrollable b) allows better control of the air that enters the house
2. Artificial ventilation …	c) is the most common method of allowing fresh outdoor air to replace indoor air in a home d) uses filters to remove dust and pollen from outside air before introducing it into the house e) has a fan and duct system f) is costly to install

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **types of ventilation systems** – типы вентиляционных систем
2) **natural ventilation** – природная (естественная) вентиляция
3) **to remove pollutants and/or moisture** – удалять загрязняющие вещества и /или влагу;
4) **exhaust fans** – вытяжные вентиляторы
5) **ventilation equipment** – вентиляционное оборудование
6) **exhaust ventilation systems** – вытяжные вентиляционные системы
7) **a fan and duct system** – система с вентилятором и трубой
8) **supply ventilation systems** – приточные вентиляционные системы

8) **balanced ventilation** – приточно-вытяжная вентиляция
9) **to supply fresh air** – подавать свежий воздух
10) **to remove dust and pollen from outside air** – удалять пыль и пыльцу из наружного воздуха
11) **energy recovery ventilation systems** – системы вентиляции с рекуперацией энергии
12) **to consume electric power** – потреблять электроэнергию.

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Types of Ventilation Systems

Natural ventilation used to be the most common method of allowing fresh outdoor air to replace indoor air in a home. A home's natural ventilation rate is unpredictable and uncontrollable, so you can't rely on it to ventilate a house uniformly.

Spot ventilation improves the effectiveness of other ventilation strategies – natural and whole house – by removing indoor air pollutants and/or moisture at their source. **Spot ventilation** includes the use of localized exhaust fans such as those used above kitchen ranges and in bathrooms.

All of the fans, vents, and ventilation equipment in a home work together as a "ventilation system" to exchange indoor and outdoor air without wasting energy. Ventilation systems can be categorized as one of four types: exhaust, supply, balanced, and heat-recovery. The right ventilation system for a particular house depends upon the climate and the needs of the structure.

Exhaust ventilation systems are relatively simple and inexpensive to install. Typically, an exhaust ventilation system is composed of a single fan connected to a centrally located, single exhaust point in the house. **Exhaust ventilation systems** are most applicable in cold climates.

Supply ventilation systems are relatively simple and inexpensive to install. A typical system has a fan and duct system that introduces fresh air into usually one – but preferably several – rooms that residents occupy most (for example, bedrooms, living room, kitchen). Supply ventilation systems allow better control of the air that enters the house than do exhaust ventilation systems.

A typical **balanced ventilation system** is designed to supply fresh air to bedrooms and common rooms where people spend the most time. It also exhausts air from rooms where moisture and pollutants are most often generated. It uses filters to remove dust and pollen from outside air before introducing it into the house. Balanced ventilation systems are appropriate for all climates; however, they are usually more expensive to install and operate than supply or exhaust systems.

Energy recovery ventilation systems usually cost more to install than other ventilation systems. Complex systems are not only more expensive to install, but often they are also more maintenance intensive and consume more electric power. Also, energy recovery ventilation systems operated in cold climates must have

devices to help prevent freezing and frost formation. In addition, they need to be cleaned regularly to prevent deterioration of ventilation rates and heat recovery, and to prevent mold and bacteria from forming on heat exchanger surfaces.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) улучшать эффективность	a) ventilation strategies
2) вентиляционные стратегии	b) to install
3) воздух внутри помещения	c) outdoor air
4) устанавливать	d) to improve the effectiveness
5) наружный воздух	e) indoor air
6) сложные вентиляционные системы	f) exchanger surfaces
7) поверхности теплообменников	g) complex ventilation systems

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Spot ventilation improves the effectiveness of other ventilation strategies …	a) more expensive to install than other ventilation systems.
2. All of the fans, vents, and ventilation equipment in a home work together as a “ventilation system” …	b) a fan and duct system that introduces fresh air into rooms that residents occupy most.
3. An exhaust ventilation system is composed of …	c) by removing indoor air pollutants and/or moisture at their source.
4. A typical supply ventilation system has …	d) to exchange indoor and outdoor air without wasting energy.
5. Energy recovery ventilation systems are …	e) a single fan connected to a centrally located, single exhaust point in the house.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. You can’t rely … natural ventilation to ventilate a house uniformly.
2. Spot ventilation improves the effectiveness … other ventilation strategies … removing indoor air pollutants.
3. Supply ventilation systems allow better control … the air that enters the house than do exhaust ventilation systems.
4. A typical balanced ventilation system exhausts air … rooms where moisture and pollutants are most often generated.
5. Energy recovery ventilation systems operated … cold climates must have devices … help prevent freezing and frost formation.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. A home's natural ventilation rate is …
   a) easily controlled; b) unpredictable and uncontrollable.
2. Spot ventilation includes the use of …
   a) filters; b) localized exhaust fans.
3. Balanced ventilation systems are appropriate for …
   a) all climates; b) cold climate.
4. Energy recovery ventilation systems…
   a) are the cheapest ones; b) cost more to install than other ventilation systems.
5. A typical balanced ventilation system is designed to supply fresh air to …
   a) rooms where people spend the most time; b) isolated rooms.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Естественная вентиляция дома непредсказуема и неконтролируема.
   (A home's natural ventilation is unpredictable and uncontrollable).
2. Правильная вентиляционная система для конкретного дома зависит от климата и потребностей структуры.
   (The right ventilation system for a particular house depends upon the climate and the needs of the structure).
3. Вытяжные вентиляционные системы относительно просты и недороги в установке.
   (Exhaust ventilation systems are relatively simple and inexpensive to install).
4. Приточные вентиляционные системы позволяют лучше контролировать входящий воздух, чем вытяжные вентиляционные системы.
   (Supply ventilation systems allow better control of the air that enters the house than do exhaust ventilation systems).
5. Вентиляционные системы с рекуперацией энергии не только дороже в установке, но и требуют больших затрат на техническое обслуживание и потребляют больше электроэнергии.
   (Energy recovery ventilation systems are not only more expensive to install, but they are also more maintenance intensive and consume more electric power).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

A home's **n**… ventilation is unpredictable and uncontrollable, so you can't rely on it to ventilate a house uniformly. Spot ventilation improves the effectiveness of other ventilation **s**… . Exhaust ventilation systems are relatively simple and inexpensive to **i**… . A typical supply ventilation system has a **f**… and **d**… system that introduces fresh air into roomsthat residents occupy most. A typical balanced

ventilation system uses **f**… to remove dust and pollen from outside air before introducing it into the house. Balanced ventilation systems are appropriate for all **c**… . Energy recovery ventilation systems are not only more expensive to install, but often they are also more maintenance intensive and consume more electric **p**… . Energy recovery ventilation systems operated in cold climates must have **d**… to help prevent freezing and frost formation.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Can you rely on natural ventilation to ventilate a house uniformly? (a home's natural ventilation rate; unpredictable and uncontrollable;to rely on; to ventilate a house uniformly)
2. What does spot ventilation improve? What does it include? (the effectiveness of other ventilation strategies;to remove; indoor air pollutants; moisture; the use of localized exhaust fans)
3. How can ventilation systems be categorized? (exhaust, supply, balanced, and heat-recovery ventilation systems)
4. What does the right ventilation system for a particular house depend upon? (the climate; the needs of the structure)
5. What ventilation systems are most applicable in cold climates? (to be most applicable in cold climates; exhaust ventilation systems)
6. What ventilation systemsare relatively simple and inexpensive to install? (to be relatively simple; to be relatively inexpensive to install; supply ventilation systems)
7. What ventilation systems are appropriate for all climates? (to be appropriate for all climates; balanced ventilation systems)

ЗАДАНИЕ 13. Расскажите о вентиляционных системах по следующему плану, используя слова, данные в скобках.

1. Natural ventilation (the most common method; a home's natural ventilation rate; unpredictable and uncontrollable; to ventilate a house uniformly).
2. Spot ventilation (to improve the effectiveness of other ventilation strategies; to remove indoor air pollutants and/or moisture at their source; to include the use of localized exhaust fans).
3. Four types of ventilation systems (exhaust; supply; balanced; heat-recovery; the right ventilation system for a particular house; to depend upon the climate and the needs of the structure).
4. Exhaust ventilation systems (simple and inexpensive to install; to be composed of a single fan; to be connected to; most applicable in cold climates).
5. Supply ventilation systems (simple and inexpensive to install; a fan and duct system; to allow better control of the air).

6. Balanced ventilation systems (to supply fresh air; to exhaust air from rooms; to use filters; to remove dust and pollen from outside air; to be appropriate for all climates; to be more expensive to install and operate).
7. Energy recovery ventilation systems (expensive to install; to be more maintenance intensive; to consume more electric power; to help prevent freezing and frost formation; to prevent deterioration of ventilation rates and heat recovery; to prevent mold and bacteria from forming).

Text 2
Modern Radiant Heating

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: technology, temperature, mass, renovation, panel, system, electricity;
b) прилагательные: thermal; active, public, metal, comfortable, radical, compact, practical;
c) глаголы: distribute, install, operate.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. With the arrival of the public water supply in the nineteenth century, a new **radiant** heating system appeared.
2. This technology also works in walls and ceilings, and it can not only **heat** but also **cool** a building.
3. Thermally active building surfaces can't **give off** heat quickly.
4. They distribute their warmth **evenly** throughout a space.
5. A radiant panel cannot be touched **safely** because burns would occur immediately.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, расскажите о термически активных строительных поверхностях и об инфракрасных нагревательных панелях.

Образец: *Thermally active building surfaces <u>have a high thermal mass</u>*.

1. Thermally active building surfaces …	a) are best suited for steady, cold temperatures b) can be operated by electricity or hot water c) distribute their warmth evenlythroughout a space

2. Infrared heating panels …	d) can provide warmth quickly e) are best suited for frequently used spaces f) are light and compact g) can't give off heat quickly h) are easy to install in an existing building i) require radical building renovation.

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **thermally active building surfaces** – термически активные строительные поверхности
2) **a circuit of metal pipes** – цепь из металлических труб
3) **to heat** – нагревать
4) **to cool** – охлаждать
5) **to achieve** – достигать
6) **to give off heat** – выделять тепло
7) **to distribute warmth evenly** – распределять тепло равномерно
8) **thermal mass** – термическая масса
9) **thermal insulation** – теплоизоляция
10) **infrared panels** – инфракрасные панели
11) **to install** – устанавливать
12) **recessed into a suspended ceiling system**–встроенный в подвесной потолок.

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Modern Radiant Heating

Thermally Active Building Surfaces

With the arrival of the public water supply in the nineteenth century, a new radiant heating system appeared: building surfaces heated by hot water running through a circuit of metal pipes. While these systems are generally known as radiant or heated floors, we prefer the term "thermally active building surfaces", as this technology also works in walls and ceilings, and it can not only heat but also cool a building, which is achieved by running cold water through the pipes.

Thermally active building surfaces have a high thermal mass, which means that they can't give off heat quickly. Because of this, they are best suited for frequently used spaces and steady, cold temperatures. They distribute their warmth evenly throughout a space, which means they're not suited to localized heating. With a

thermally active building surface, the whole roomwill becomfortable, regardless of how many people are inside and how much space is being occupied.

The main disadvantage of heated building surfaces is that they require radical building renovation, because the floor, the wall or the ceiling has to be broken away and built up again. Furthermore, thermal insulation is a necessity for outer walls or a great deal of heat will be lost to the outside.

Infrared Heating Panels

The most recent radiant heating systems are infrared panels, which can be operated by electricity or hot water. Radiant heating panels can provide warmth quickly.Radiant heating panels have more advantages over older systems. For example, they are light and compact, and, unlike heated building surfaces, they are easy to install in an existing building. Radiant panels can be mounted on the walls or the ceiling; they can be free-hanging, or recessed into a suspended ceiling system.

This makes it practical to use them in multiple rooms, and it also makes them suitable for tenants, who can take their heating system with them when they move to another place. On the downside, the heating surface of a radiant panel cannot be touched safely because burns would occur immediately.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) излучающие полы или полы с подогревом	a) localised heating
2) лучше всего подходят	b) outer walls
3) локальное отопление	c) radiant or heated floors
4) радикальный ремонт здания	d) to touch safely
5) наружные стены	e) best suited (for)
6) свободно висящий	f) radical building renovation
7) безопасно касаться	g) free-hanging

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Thermally active building surfaces can heat or cool a building, which is achieved by …	a) burns would occur immediately.
2. The main disadvantage of heated building surfaces is that they …	b) electricity or hot water.
3. Thermally active building surfaces can’t …	c) require radical building renovation.
4. Infrared panels can be operated by …	d) running cold water through the pipes.
5. The heating surface of a radiant panel cannot be touched safely because …	e) give off heat quickly.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Thermally active building surfaces are best suited … frequently used spaces and steady, cold temperatures.
2. They distribute their warmth evenly … a space.
3. The main disadvantage … heated building surfaces is that they require radical building renovation.
4. Thermal insulation is a necessity … outer walls or a great deal … heat will be lost.
5. Radiant panels can be mounted … the walls or the ceiling, they can be free-hanging, or recessed … a suspended ceiling system.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. A new radiant heating system appeared in the …
   a) 20th century; b) 19thcentury.
2. Thermally active building surfaces are best suited for …
   a) frequently used spaces; b) rarely used spaces.
3. Infrared panels can be operated by …
   a) liquefied gas; b) electricity or hot water.
4. Infrared heating panels are …
   a) light and compact; b) heavy and bulky.
5. It is it practical to use radiant panels in…
   a) multiple rooms; b) isolated rooms.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. В девятнадцатом веке появилась новая система лучистого отопления: строительные поверхности, нагреваемые горячей водой, протекающей по цепи из металлических труб.
   (In the nineteenth century, a new radiant heating system appeared: building surfaces heated by hot water running through a circuit of metal pipes).
2. Термически активные строительные поверхности лучше всего подходят для часто используемых помещений и устойчивых, холодных температур.
   (Thermally active building surfaces are best suited for frequently used spaces and steady, cold temperatures).
3. Основным недостатком нагреваемых строительных поверхностей является то, что они требуют радикальной реконструкции здания.
   (The main disadvantage of heated building surfaces is that they require radical building renovation).

4. Наиболее современными системами лучистого отопления являются инфракрасные панели, которые могут работать от электричества или горячей воды.
   (The most recent radiant heating systems are infrared panels, which can be operated by electricity or hot water).
5. Инфракрасные панели легко установить в существующем здании.
   (Infrared panels are easy to install in an existing building).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

With the arrival of the public water supply in the 19thcentury, a new **r**… **h**… system appeared: building **s**… heated by hot water running through a circuit of metal pipes. Thermally active building surfacescan not only **h**… but also **c**… a building. They can't give off **h**… quickly and are best suited for frequently used spaces and steady, cold temperatures. With a thermally active building surface, the whole room will be **c**… , regardless of how many people are inside.The main disadvantage of heated building surfaces is that they require radical building **r**… . The most recent radiant heating systems are **i**… panels, which can be operated by electricity or hot water. They are **l**… and **c**…, and are easy to install in an existing building. The main disadvantage of the heating **s**… of a **r**… panel is that it cannot be touched **s**… because burns would occur immediately.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках:

1. What kind of a new radiant heating system appeared with the arrival of the public water supply in the nineteenth century? (building surfaces heated by hot water)
2. How is heating or cooling of a building by means of thermally active building surfaces achieved? (hot or cold water running through the pipes)
3. Can thermally active building surfaces give off heat quickly? (to give off heat quickly)
4. Why are thermally active building surfaces best suited for frequently used spaces and steady, cold temperatures? (to have a high thermal mass; to give off heat quickly)
5. What is the main disadvantage of heated building surfaces? (to require radical building renovation)
6. What are the most recent radiant heating systems? (infrared panels)
7. What are the advantages of infrared panels? (light and compact; easy to install in an existing building)
8. What is the main disadvantage of infrared panels? (to be touched safely; burns; to occur immediately)

ЗАДАНИЕ 13. Расскажите о современных системах лучистого отопления по следующему плану, используя слова, данные в скобках.

1. The arrival of thermally active building surfaces in the 19th century (a new radiant heating system; building surfaces heated by hot water; a circuit of metal pipes).
2. Advantages of thermally active building surfaces (to distribute warmth evenly throughout a space; to be best suited for; frequently used spaces; steady, cold temperatures; to becomfortable).
3. Disadvantages of thermally active building surfaces (to require radical building renovation; thermal insulation; outer walls).
4. Infrared heating panels (to be operated by electricity or hot water).
5. Advantages of infrared heating panels over older systems (to provide warmth quickly;to be light and compact;to be easy to install; to be mounted onthe walls, the ceiling;to be free-hanging; to be recessed into a suspended ceiling;practical to use in multiple rooms;easy to take a heating system to another place).
6. The downside of infrared heating surface (to be touched safely; burns; to occur immediately).

Тексты для самостоятельной работы по теме «Heating, Ventilation and Air Conditioning»

Text A

Прочитайте текст и выполните задание.

Alternative Energy Sources

Alternative energy sources are widely available and environment friendly. They cause little or almostno pollution.

Solar Energy

Solar energy is one the alternative energy source that is used most widely across the globe. There are two kinds of solar energy: the active solar energy and the passive solar energy. Passive solar energy basically uses duration, position and sun's ray intensity to its advantage in heating a particular area. Active solar energy uses electrical technology and mechanical technology like collection panels in capturing, converting and storing of energy for future use.

Wind Energy

This is one of the energy sources that have been in use for a very long time and for centuries. It does not cause any air pollution and have created several jobs in last few decades. Advancement in technologies has brought down the cost of setting up wind power plant. Wind energy can only be used in areas which experience high winds which mean that it cannot be used as a source to extract energy anywhere on earth.

Geothermal Energy

Geothermal energy can be found anywhere on the earth. Most countries tap this energy to generate electricity, using thermal mass flow meters, and power millions of homes. Geothermal energy is totally renewable. If these resources are tapped and are utilized effectively, they can provide solution to the world's power problems.

Biomass Energy

Apart from wood, the other products that are used to create biomass energy include crops, plants, landfills, municipal and industrial waste, trees and agricultural waste. Biomass is renewable source of energy as we would be able to produce it as long as crops, plants and waste exist. It does not create any greenhouse gases and is can be easily extracted through the process of combustion. Another advantage of biomass is that it helps to reduce landfills.

Ocean Energy

Due to massive size of oceans, this energy can be used on much wider scale than other alternative sources of energy. The waves produced by the ocean and tides that hit the sea shore have enormous potential in them. There are 3 ways, i.e. tidal energy, wave energy and ocean thermal energy conversion via which ocean energy can be harnessed.

Hydrogen Energy

Hydrogen has tremendous potential and can be used to power up homes, vehicles and even space rockets. The main benefit of hydrogen energy is that it is clean source of fuel and does not leave any waste elements behind except water. There are no harmful emissions.It is environment friendly. It is completely renewable and can be produced over and over again on demand.

WRITING TASK

Напишите эссе на английском языке на тему «Альтернативные источники энергии».

Text B

Прочитайте текст и выполните задание.

HVAC Systems

Heating, ventilation, and air conditioning (HVAC) system is designed to achieve the environmental requirements of the comfort of occupants and a process.

HVAC systems are more used in different types of buildings such as industrial, commercial, residential and institutional buildings. The main mission of HVAC system is to satisfy the thermal comfort of occupants by adjusting and changing the outdoor air conditions to the desired conditions of occupied buildings. Depending on outdoor conditions, the outdoor air is drawn into the buildings and heated or cooled before it is distributed into the occupied spaces, then it is exhausted to the ambient air or reused in the system. The selection of HVAC systems in a given building will

depend on the climate, the age of the building, the individual preferences of the owner of the building and a designer of a project, the project budget, the architectural design of the buildings.

HVAC systems can be classified according to necessary processes and distribution process. The required processes include the heating process, the cooling process, and ventilation process. Other processes can be added such as humidification and dehumidification process. These processes can be achieved by using suitable HVAC equipment such as heating systems, air-conditioning systems, ventilation fans, and dehumidifiers. The HVAC systems need the distribution system to deliver the required amount of air with the desired environmental condition. The distribution system mainly varies according to the refrigerant type and the delivering method such as air handling equipment, fan coils, air ducts, and water pipes.

The major classification of HVAC systems is central system and decentralized or local system. Types of a system depend on addressing the primary equipment location to be centralized as conditioning entire building as a whole unit or decentralized as separately conditioning a specific zone as part of a building. Therefore, the air and water distribution system should be designed based on system classification and the location of primary equipment. The criteria as mentioned above should also be applied in selecting between two systems.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Современные системы отопления, вентиляции и кондиционирования воздуха».

Unit 2
Water Supply and Water Disposal

Text 1
Water Sources

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: machine, planet, fact, bacteria, materials, iceberg, chemicals, industries, agriculture, transportation, role, ocean;
b) прилагательные: industrial, agricultural, natural, potential;
c) глаголы: purify, evaporate, expose, conserve.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Humans use water for **domestic use**, in industries, for agriculture, for **recreational purposes** and even for transportation.

2. Two thirds of the fresh water **available** is frozen as ice glaciers.
3. The fresh **water sources** include lakes, rivers and even underground water.
4. Water is purified in water plants and the water is made safe for human **consumption**.
5. Underground river flows are a **reliable** source of water.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, расскажите о поверхностных и подземных (грунтовых) водах.

Образец*: Surface water <u>is the water mainly used for domestic, agricultural and industrial use.</u>*

1. Surface water …	a) includes river and lake water b) is a natural source of purified water c) is the water we get through our taps
2. Underground water …	d) needs chemicals to clean it e) includes water from wells f) is a safe source of water

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **domestic use** – бытовое использование
2) **agriculture** – сельское хозяйство
3) **complicated** – сложный
4) **cooling down** – охлаждение
5) **glaciers** – ледники
6) **surfacewater** – поверхностные воды
7) **industrial use** – промышленное использование
8) **to purify water** – очищать воду
9) **to remove** – удалять
10) **safe** – безопасный
11) **consumption** – потребление
12) **undergroundwater** – подземные (грунтовые) воды
13) **springs** – родники
14) **wells** – скважины

ЗАДАНИЕ 5. Прочитайте и переведите текст

Water Sources

Humans use water for various things such as domestic use, in industries, for agriculture, for recreational purposes and even for transportation. Water plays a very big role in our lives and life would literally be impossible without it. We need it for

simple activities such as drinking and cooking and for complicated uses such as cooling down industrial machines.

Only three percent of all water on the planet is fresh water. This means that the other 97 percent is salt water in the oceans. Even more fascinating is the fact that two thirds of the fresh water available is frozen as ice glaciers. This leaves a very small percentage that we use as fresh water for the various activities mentioned above. The fresh water sources include lakes, rivers and even underground water.

Surface water includes river and lake water. This is the water mainly used for domestic and agricultural use as well as industrial use. The water we get through our taps normally comes from surface water. This water is purified in water plants as bacteria and other materials are removed and the water is made safe for human consumption.

Water from springs or **underground water** from wells is another safe source of water. The best thing about this water source is that it does not require a large purification plant to clean it or require any chemicals to clean it. It is a natural source of purified water. In addition, underground river flows are a reliable source of water as they are always flowing because they do not evaporate. They are not exposed to the sun, and so cannot evaporate, but they are always replenished when it rains and water seeps into the ground.

Icebergs are a potential source of fresh water for humans. However, there has been very little success in turning this ice into water that can be used on a mass scale. As research continues for other ways of getting fresh water for ourselves, we need to ensure that the little water we have is conserved.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) замороженная вода	a) surface water
2) водные источники	b) chemicals
3) поверхностные воды	c) frozen water
4) подземные воды	d) a safe source
5) удалять бактерии	e) to evaporate
6) очистка воды	f) water sources
7) химикаты	g) water purification
8) безопасный источник	h) underground water
9) испарять	i) to remove bacteria

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Our life would be impossible …	a) frozen as ice glaciers.
2. Only three percent of all water on the planet is …	b) lakes, rivers and even underground water.

3. The other 97 percent is …	c) without water.
4. Two thirds of the fresh water available is …	d) fresh water.
5.The fresh water sources include …	e) salt water in the oceans.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Humans use water … various things such as domestic use, … industries, … agriculture, … recreational purposes and even … transportation.
2. The water we get … our taps normally comes … surface water.
3. Surface water is purified … water plants.
4. When bacteria and other materials are removed the water is made safe … human consumption
5. Icebergs are a potential source … fresh water … humans.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Fresh water on the planet constitutes …
   a) 35 percent; b) only 3 percent.
2. Salt water in the oceans constitutes …
   a) 50 percent; b) 97 percent.
3. Surface water includes …
   a) river and lake water; b) water from springs and wells.
4. Underground water includes …
   a) ice glaciers; b) water from wells.
5. Water available frozen in glaciers constitutes …
   a) half of the fresh water; b) two thirds of the fresh water.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Вода играет очень большую роль в нашей жизни, и жизнь буквально была бы невозможна без нее.
   (Water plays a very big role in our lives and life would literally be impossible without it).
2. Поверхностные воды пригодны как для бытового и сельскохозяйственного использования, так и для промышленного использования.
   (Surface water is the water used for domestic and agricultural use as well as industrial use).
3. Вода из родников или подземные воды из скважин – это еще один безопасный источник воды.
   (Water from springs or underground water from wells is another safe source of water).

4. Подземные речные потоки являются надежным источником воды, потому что они не испаряются.
   (Underground river flows are a reliable source of water because they do not evaporate).
5. Айсберги – это потенциальный источник пресной воды для людей.
   (Icebergs are a potential source of fresh water for humans).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Our life would be impossible without **w**… . We need it for **s**… activities and for **c**… uses. Only three percent of all water on the planet is f… water. The other 97 percent is **s**… water in the oceans. The fresh water sources include **l**…, **r**… and even underground water. **S**… water includes river and lake water. This water is **p**… in water plants as **b**… and other materials are removed and the water is made safe for human **c**… . Water from **s**… or underground water from **w**… is another safe source of water. The best thing about this water source is that it is a natural source of **p**… water. In addition, underground river flows are a **r**… source of water as they do not **e**… . **I**… are a potential source of fresh water for humans.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Does water play a very big role in our lives? (water; to play a very big role in our lives)
2. What do we need water for? (simple activities; drinking and cooking; complicated uses; cooling down industrial machines)
3. What do the fresh water sources include? (the fresh water sources; to include; lakes, rivers and underground water)
4. What is surface water mainly used for? (domestic and agricultural use; industrial use)
5. How is surface water purified? (to purify in water plants; to remove bacteria and other materials; to make water safe for human consumption)
6. Is underground water a natural source of purified water? (springs; underground water from wells; another safe source of water)
7. What is a potential source of fresh water for humans? (icebergs; a potential source of fresh water for humans)

ЗАДАНИЕ 13. Расскажите об источниках воды по следующему плану, используя слова, данные в скобках.

1. What do we need water for? (to use water for various things; domestic use; in industries; agriculture; recreational purposes; transportation; simple activities; complicated uses; cooling down industrial machines).

2. Fresh water reserves on our planet (only three percent of all water; fresh water sources; frozen as ice glaciers; to include; lakes, rivers; underground water).
3. Surface water (surface water; to include; river and lake water; domestic and agricultural use; industrial use).
4. Purification of surface water (to purify; water plants; to remove; bacteria and other materials; safe for human consumption).
5. Underground water (underground water from wells; a safe source of water; to require chemicals; to clean; a natural source of purified water; underground river; a reliable source of water; to evaporate).
6. Potential source of fresh water for humans (icebergs; a potential source of fresh water for humans; to turn ice into water; on a mass scale).

Text 2
Sewage Treatment

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: microorganisms, system, product, business, objects, bacteria, microorganisms, disinfection, ozone, effect, principle;
b) прилагательные: typical, industrial, ultraviolet, biological;
c) глаголы: process, collect, separate, eliminate.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Sewage is the collective term for water that drains from toilets, sinks, showers, and **liquid** industrial **waste**.
2. Sewage treatment refers to the process of removing microorganisms and other types of **contaminants** from wastewater.
3. Most domestic waste is collected in a sewer system and sent through **pipelines** to a central sewage treatment plant.
4. Sand and rocks, collectively referred to as **grit**, are allowed to settle out in a **holding tank**.
5. Many treatment plants employ tertiary treatment **to raise the quality** of the effluent.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, расскажите оцелях очистки сточных вод на различных стадиях процесса.

Образец*: The purpose of pretreatment is to avoid the clogging or damaging of equipment further in the treatment process.*

1. Pretreatment includes …	a) break down biological matter.
2. The main purpose of primary treatment is to …	b) the process of removing large objects.
	c) further filtration.
3. The purpose of secondary treatment is to …	d) allow particles to settle out in holding tanks.
4. Tertiary treatment includes …	e) disinfection.
	f) the removal of nitrogen and phosphorous.

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **sewage** – канализация
2) **sewage treatment plant** – станция водоочистки, завод по очистке сточных вод
3) **to remove** – устранять, удалять
4) **contaminants** – загрязняющие вещества
5) **effluent** – жидкие промышленные отходы
6) **environment** – окружающая среда
7) **wastewater** – сточные воды
8) **pretreatment** – предварительная обработка
9) **primary treatment** – первичная обработка
10) **secondary treatment** – вторичная обработка
11) **tertiary treatment** – третичная обработка
12) **grit** – песок, гравий
13) **particles** – частицы
14) **sludge** – осадок сточной жидкости
15) **homogeneous** – однородный
16) **detergents** – моющие средства
17) **to accomplish** – достигать
18) **nitrogen** – азот
19) **phosphorous** – фосфорсодержащие вещества
20) **chlorination** – хлорирование
21) **to process** – обрабатывать
22) **landfill** – свалка, полигон отходов

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Sewage Treatment

Sewage treatment refers to the process of removing microorganisms and other types of contaminants from wastewater. In more developed countries, most domestic waste is collected in a sewer system and sent through pipelines to a central sewage

treatment plant. At these plants, sewage treatment is done in a multi-step process that removes or changes different types of material in stages, so that the end product, or effluent, is safe to return into the environment.

All residences, businesses, hospitals, and other establishments which use water, produce wastewater in the form of sewage. Sewage is the collective term for water that drains from toilets, sinks, showers, and liquid industrial waste. A typical sewage treatment process involves pretreatment, as well as primary, secondary, and tertiary treatment stages.

Pretreatment includes the process of removing large objects from sewage to avoid the clogging or damaging of equipment further in the treatment process. Items such as sticks, rags, etc., are removed by a mechanical screening process, and are then usually sent to a landfill. Sand and rocks, collectively referred to as grit, are allowed to settle out in a holding tank, where they are swept into a device that collects them, after which they are also sent to a landfill.

Primary treatment operates on much the same principle as the pretreatment and screening processes. Its main purpose is to allow particles to settle out in holding tanks, into a "sludge" which is collected and processed elsewhere. Grease and oils are separated in this stage, since they are lighter than water and will float to the top. This allows the sewage after this stage to be dealt with as a whole, since it is more homogeneous.

The purpose of **secondary** sewage **treatment** is to break down biological matter that is present in the sewage from sources like human waste and detergents. This is accomplished through various related techniques, all of which use bacteria and other helpful microorganisms to break down dissolved biological contaminants.

To further raise the quality of the effluent before it is discharged, many treatment plants employ **tertiary treatment**. Further filtration and the removal of nitrogen and phosphorous constitute this step. Tertiary treatment often includes disinfection, especially in developed countries. This is usually accomplished either through chlorination or by treating the water with ozone or ultraviolet light, all of which have the effect of eliminating harmful bacteria and other organisms before the water is returned to the environment through a river, ocean, or other avenue.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) сточные воды	a) homogeneous
2) многоступенчатый процесс	b) further filtration
3) однородный	c) wastewater
4) жидкие промышленные отходы	d) to eliminate harmful bacteria
5) повреждение оборудования	e) effluent
6) дальнейшая фильтрация	f) a multi-step process
7) устранять вредоносные бактерии	g) damaging of equipment

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Sewage treatment refers to …	a) pretreatment, primary, secondary, and tertiary treatment stages.
2. In developed countries, most domestic waste …	b) drains from toilets, sinks, showers, and liquid industrial waste.
3. All residences, businesses, hospitals, and other establishments which use water, produce …	c) is collected in a sewer system and sent through pipelines to a central sewage treatment plant.
4. Sewage is the collective term for water that …	d) the process of removing microorganisms and other types of contaminants from wastewater.
5. A typical sewage treatment process involves …	e) wastewater in the form of sewage.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Sewage treatment is done … a multi-step process that removes or changes different types … material … stages.
2. Such items as sticks and rags are removed … a mechanical screening process.
3. Primary treatment operates … much the same principle as the pretreatment
4. Tertiary treatment often includes disinfection, especially … developed countries.
5. Disinfection is usually accomplished either … chlorination or … treating the water …ozone or ultra violet light.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. A typical sewage treatment process involves …
   a) two stages; b) four stages.
2. Primary treatment works …
   a) on the same principle as the pretreatment; b) to eliminate biological matter from in the sewage.
3. The purpose of secondary sewage treatment is …
   a) to break down dissolved biological contaminants; b) to remove large objects from sewage.
4. To further raise the quality of the effluent before it is discharged, many treatment plants employ …
   a) special algae; b) tertiary treatment.
5. Tertiary treatment often includes…
   a) disinfection; b) grease and oils separation.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. На станции водоочистки происходит обработка сточных вод в ходе многоступенчатого процесса.
   (At a sewage treatment plant, sewage treatment is done in a multi-step process).
2. Все жилые дома, деловые учреждения, больницы, которые используют воду, производят сточные воды в форме канализации.
   (All residences, businesses, hospitals, and other establishments which use water, produce wastewater in the form of sewage).
3. Типичный процесс очистки канализационных вод включает предварительную обработку, первичную обработку, вторичную обработку и третичную обработку.
   (A typical sewage treatment process involves pretreatment, primary, secondary, and tertiary treatment stages).
4. Предварительная обработка включает процесс удаления крупных объектов из канализации, чтобы избежать в дальнейшем процессе очистки повреждения оборудования.
   (Pretreatment includes the process of removing large objects from sewage to avoid damaging of equipment further in the treatment process).
5. Для распада растворенных в воде биологических загрязняющих веществ используют бактерии и другие микроорганизмы.
   (Bacteria and other microorganisms are used to break down dissolved biological contaminants).

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Sewage **t**… refers to the process of removing microorganisms and other types of **c**… from **w**… . In developed countries, most domestic waste is processed at a central **s**…**t**…**p**… . A typical sewage treatment process involves **p**…, as well as **p**…, **s**…, and **t**… treatment stages. Pretreatment includes the process of removing large **o**… from sewage. The main purpose of primary treatment is to allow **p**… to settle out in holding tanks, into a "**s**…" which is collected and processed elsewhere. **G**… and **o**… also are separated in this stage. During secondary treatment biological matter is broken down with the help of **b**… and other helpful **m**… . Tertiary treatment often includes **d**… before the water is returned to the environment.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What process does sewage treatment refer to? (to remove microorganisms; contaminants; wastewater)
2. Where is wastewater sent to in more developed countries? (to collect in a sewer system; to send through pipelines; a central sewage treatment plant)

3. What is done at sewage treatment plants? (sewage treatment; a multi-step process)
4. What stages does a typical sewage treatment process involve? (a typical sewage treatment process; to involve; pretreatment; primary treatment; secondary treatment; tertiary treatment)
5. What process does pretreatment include? (to remove large objects from sewage; to avoid the clogging or damaging of equipment)
6. On what principle does primary treatment operate? (the same principle as the pretreatment and screening processes)
7. What is the purpose of secondary sewage treatment? (to break down biological matter; sources like human waste and detergents)
8. What does tertiary treatment include? (disinfection; chlorination; to treat the water with ozone or ultraviolet light)

ЗАДАНИЕ 13. Расскажите об очистке сточных вод по следующему плану, используя слова, данные в скобках.

1. Sewage treatment at a sewage treatment plant (more developed countries; domestic waste; to collect in a sewer system; to send through pipelines to a central sewage treatment plant).
2. Stages of a typical multi-step sewage treatment process (a multi-step process; to involve; pretreatment; primary treatment; secondary treatment; tertiary treatment).
3. Pretreatment (to remove large objects; to avoid the clogging; damaging of equipment; grit; to settle out in a holding tank).
4. Primary treatment (a “sludge”; to collect; to process; grease; oils; to be separated; homogeneous).
5. Secondary sewage treatment (to break down biological matter; human waste and detergents; to be accomplished; to use bacteria and other helpful microorganisms).
6. Tertiary treatment (further filtration; the removal of nitrogen and phosphorous; disinfection; chlorination; ozone; ultraviolet light; to eliminate harmful bacteria and other organisms; to return the water to the environment).

Тексты для самостоятельной работы по теме «Water Supply and Water Disposal»

Text A

Прочитайте текст и выполните задание.

Water Distribution System

Providing sufficient water of appropriate quality and quantity has been one of the most important issues in human history. Most ancient civilizations were initiated near water sources. As populations grew, the challenge to meet user demands also increased.

People began to transport water from other locations to their communities. For example, the Romans constructed aqueducts to deliver water from distant sources to their communities.

Today, a water supply system consists of infrastructure that collects, treats, stores, and distributes water between water sources and consumers. The purpose of distribution system is to deliver water to consumer with appropriate quality, quantity and pressure. Distribution system is used to describe collectively the facilities used to supply water from its source to the point of usage.

Requirements of Good Distribution System

1. Water quality should not get deteriorated in the distribution pipes.
2. It should be capable of supplying water at all the intended places with sufficient pressure head.
3. It should be capable of supplying the requisite amount of water during firefighting.
4. The layout should be such that no consumer would be without water supply, during the repair of any section of the system.
5. All the distribution pipes should be preferably laid one metre away or above the sewer lines.
6. It should be fairly water-tight as to keep losses due to leakage to the minimum.

Layouts of Distribution Network

The distribution pipes are generally laid below the road pavements, and as such their layouts generally follow the layouts of roads. There are, in general, four different types of pipe networks; any one of which either singly or in combinations, can be used for a particular place. They are: Grid**,** Ring**,** Radial and Dead End System**.**

Water distribution system should be based on a pipe layout that is suitable and have no or less water stagnation within the pipe to avoid tuberculation, encrustation and sediment deposits.

In addition, regulators and policy makers should require water utilities to do periodic water audits and regularly publish detailed water distribution system data, which can then be independently audited. Again, water distribution system management should not be a one-time activity.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Система водораспределения».

Text B

Прочитайте текст и выполните задание.

Types of Filters for Water Treatment

Water purification is the process of removing undesirable chemicals, biological contaminants, suspended solids, and gases from water. The goal is to produce water fit for specific purposes. Most water is purified and disinfected for human consumption (drinking water), but water purification may also be carried out for a variety of other purposes, including medical, pharmacological, chemical, and industrial applications. A water filter removes impurities by lowering contamination of water using a fine physical barrier, a chemical process, or a biological process. There are four main types of filtration and they employ a mixture of physical and chemical techniques.

Carbon filter

Filter works via a process called adsorption, whereby pollutant molecules in the fluid to be treated are trapped inside the pore structure of the carbon substrate. The efficacy of a carbon filter is also based upon the flow rate regulation. When the water is allowed to flow through the filter at a slower rate, the contaminants are exposed to the filter media for a longer amount of time.

Reverse osmosis

Reverse osmosis (RO) is a water purification technology that uses a partially permeable membrane to remove ions, molecules and larger particles from drinking water. Reverse osmosis can remove many types of dissolved and suspended chemical species as well as biological ones (principally bacteria) from water, and is used in both industrial processes and the production of potable water.

Ion exchange

Ion exchange technology is used to remove monovalent and divalent ions and metals from produced water by ionizing the relevant minerals. The energy requirements are minimal while it is subjected to fouling and high chemical cost issues. Usually ion exchange technology is applied combined with other technologies such as adsorption to treat produced water.

Distillation

Distillation will not remove all the chemicals but removes soluble minerals (i.e., calcium, magnesium, and phosphorous) and dangerous heavy metals like lead, arsenic, and mercury. Some of the chemicals of concern produce hazardous compounds during the heating process. The vaporization process strips salt, metals, and biological threats.

In reality, there is no single filter or treatment that will eliminate 100% of every contaminant from your water. Many technologies target only a specific type of contaminant and may be completely ineffective against others.

WRITING TASK

Напишите эссе на английском языке на тему «Фильтрация воды в мировой практике».

Unit 3
Technosphere Safety in Construction

Text 1
Basic Principles of Fire Protection

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: principle, design, structure, risk, effect, material, process, system, specialist;
b) прилагательные: passive, active, electrical, automatic;
c) глаголы: to minimize.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. The building was **designed** and constructed according to the project.
2. They tried to avoid any structural **collapse.**
3. These building materials burn quickly and can't **prevent** the spread of fire.
4. Electrical equipment is a **source** of fire.
5. To protect the lives is a **responsibility** of a fire prevention engineer.

ЗАДАНИЕ 3. Познакомьтесь со словами и словосочетаниями, которые помогут понять текст:

1) **hazard** – опасность (потенциальная)
2) **danger** – опасность, беда (реальная)
3) **damage**– ущерб, повреждение
4) **ignition** – воспламенение
5) **to withstand** – противостоять, выдерживать
6) **precaution** – предосторожность
7) **to install** – устанавливать
8) **arson** – поджог
9) **alarm** – тревога, оповещение
10) **extinction** – тушение

ЗАДАНИЕ 4. Прочитайте и переведите текст.

Basic Principles of Fire Protection

Fire hazard in buildings may be divided into internal (danger to occupants of the building and damage to structure and contents) and external. The basic principles of fire protection are following:

- every building should be designed and constructed to reduce the risk of ignition of the building and the spread of fire;
- the parts of the building are required to withstand the effects of fire long enough to avoid any structural collapse;
- building regulations deal with the certain requirements for the structure, the nature of the materials used and the surface finishes of the building structure.

The fire safety presupposes the passive and active fire precautions. Passive precautions must be considered at the stage of the building design process. The building should be constructed:

- from building materials that will not contribute to the spread of fire;
- in such a manner that, if a fire starts, the extent of fire and smoke damage will be minimized;
- to prevent fire spread into the premises from the external fire sources.

Electrical equipment should be designed, constructed and installed in amanner that reduces its potential as an accidental source of ignition. There should be adequate provision to prevent an arson attack.

Active fire precautions represent the installation of alarm and detector systems, the equipment for automatic extinction, and the provision of first-aid fire- fighting equipment. All systems should be installed by adequately trained specialists.

A fire prevention engineer should consider some building regulations and requirements related to fire precautions from the early planning stage untilthe occupation of the building. He has two duties: to protect the lives and to safeguard property within the building.

ЗАДАНИЕ 5. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

пожарная опасность, пожарная защита, распространение огня, пожарная бебзопасность, ущерб от огня и дыма, системы обнаружения и оповещения, обезопасить имущество.

ЗАДАНИЕ 6. Соедините части предложений по смыслу.

1. Fire hazard may be divided into …	a) will be minimized.
2. The parts of the building should withstand …	b) into internal and external.

3. The fire safety deals with …	c) activefireprecautions.
4. The extent of fire and smoke damage …	d) the effects of fire for a long time.
5. The installation of the equipment for automatic extinction refers to …	e) the passive and active fire precautions.

ЗАДАНИЕ 7. Вставьте необходимые предлоги.

1. Fire hazard in buildings may be divided … internal and external.
2. Passive precautions must be considered … the stage of the building design process.
3. Active fire precautions represent the installation … alarm and detector systems.
4. All systems should be installed … adequately trained specialists.
5. A fire prevention engineer should consider some building regulations related to fire precautions … the early planning stage.

ЗАДАНИЕ 8. Ответьте на вопросы об основных принципах пожарной защиты.

1. How may fire hazard in buildings be divided?
2. What are the basic principles of fire protection?
3. What do the passive fire precautions mean?
4. Is electrical equipment a potential source of ignition?
5. Can we refer the provision of first-aid fire-fighting equipment to the active or passive fire precautions?
6. Who is responsible for the people and property within the building?

ЗАДАНИЕ 9. Подтвердите словами из текста, что:

1. Определенные требования предъявляются к строительным материалам и финишной отделке здания (certain requirements, surface finishes).
2. Пассивные меры безопасности рассматриваются на стадии планирования здания (stage of the building design process).
3. Необходимы спланированные действия по предотвращению поджога (provision, an arson attack).
4. Все системы противопожарной защиты устанавливаются профессионалами (adequately trained specialists).
5. Две основные обязанности инженера противопожарной безопасности - это защитить людей и обезопасить имущество (to protect, to safeguard).

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите следующие предложения.

1. Every building should be designed and constructed …
   a) to reduce the risk of ignition; b) to increase the spread of fire.

2. One of the passive precautions is …
   a) to prevent fire spread from the external fire sources; b) to prevent fire extinction.
3 Electrical equipment is …
   a) the only source of ignition; b) an accidental source of ignition.
4. A fire prevention engineer should consider building regulations …
   a) at the finishing stage of the design process; b) from the early planning stage.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Fire **h…** is divided into internal and external. The main principles of fire protection are to reduce the risk of **i…**, to avoid any **s…** collapse, to deal with the certain **r…** for the structure and the materials used. Passive precautions involve proper building materials, **p…** of fire and smoke spread and damage, correct **i…** of electrical equipment. The installation of **a…** and **d…** systems, the equipment for automatic **e…**, and the first-aid **f…-f…** equipment are active fire precautions. A fire prevention engineer has to **p…** the lives and to **s…** property within the building.

ЗАДАНИЕ 12. Расскажите об основных принципах противопожарной защиты по следующему плану, используя слова, данные в скобках.

1. Fire hazard (internal, external).
2. The basic principles of fire protection (to reduce the risk of ignition, structural collapse, certain requirements).
3. The passive fire precautions (building materials, fire and smoke spread and damage, electrical equipment, arson).
4. The active fire precautions (alarm and detector systems, the equipment for automatic extinction, the first-aid fire-fighting equipment).
5. The duties of a fire prevention engineer (to protect, to safeguard).

Text 2
Safety Procedures at Construction Site

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: personnel, sticker, platform, material, location, machine, management;
b) прилагательные: personal, mechanical;
c) глаголы: to operate, to recommend.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. **Hard hats** are necessary at job sites.
2. Hand **gloves** protect hands during cleaning operations.
3. There should be **lighting** when the work is carried out at night.
4. **Cranes** lift the heavy and large objects at the construction site.
5. Machine operator should always see **ground** personnel.

ЗАДАНИЕ 3. Познакомьтесь со словами и словосочетаниями, которые помогут понять текст:

1) **safety** – безопасность
2) **face shield** – защитная маска
3) **welding** – сварка
4) **debris** – мусор
5) **to overload** – перегружать
6) **injury** – травма
7) **fire extinguisher** – огнетушитель
8) **forklift** – вилочный погрузчик
9) **capacity** - мощность, способность
10) **weight** – вес

ЗАДАНИЕ 4. Прочитайте и переведите текст.

Safety Procedures at Construction Site

Any construction site is a dangerous occupation for all personnel, especially for those working on site and so one must be prepared every day for safety. For this purpose, various safety measures have to be taken.

Personal protective equipment (PPE) is supplied to all the personnel working on site and even for the personal who are temporary visiting the site.

Hard hats have to be worn all times at job site. Safety glasses and face shields are required when operating any spark producing activity or during all welding operations. Hand gloves and hard soul shoes are recommendedduring cleaning operations, cutting metals or similar works. Purpose of safety vest is to keep the person always clear in view, even in the dark. It is compulsory to wear hearing protection equipment near any equipmentwhich makes loud noises. Sometimes dust mask is supplied as respiration protection while working with fiber glass, cleaning the floors or handling debris.

In addition, some basic safety precautions must be observed at construction site:

- yellow stickers with safety notes to be pasted where necessary;
- all the working platforms should be stable and not be overloaded;

- the site should be clean all the times and the material should be stored safely;
- first aid should be available at all times on site for cuts, burns or any injuries;
- fire extinguishers to be placed on site on proper locations in case of any fire;
- proper lighting should be on the site especially when the work is carried out during the night;
- equipment operator needs to take care of the weight lifting capacity of the equipment like forklifts, cranes and other similar to avoid accidents;
- ground personnel should be in machine operator's vision always while working around the heavy mechanical equipment.

Construction project execution is impossible without proper health and safety management.

ЗАДАНИЕ 5. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

меры безопасности, средства индивидуальной защиты, сварочные работы, резка металлов, спасательный жилет, средства защиты слуха, защита органов дыхания, меры предосторожности, устойчивый, хранить в безопасном месте, ожог, грузоподъемная мощность (способность).

ЗАДАНИЕ 6. Соедините части предложений по смыслу.

1. Personal protective equipment are supplied …	a) safely.
2. Safety glasses and face shields are used …	b) during all welding operations.
3. Hand gloves and hard soul shoes are recommended …	c) as respiration protection.
4. Hearing protection equipment protects …	d) to all the personnel working on site and visiting it.
5. Dust mask is supplied …	e) from loud noises.
6. The materials at the site should be stored …	f) during cutting metals.

ЗАДАНИЕ 7. Вставьте необходимые предлоги.

1. Any construction site is a dangerous occupation … all personnel.
2. Personal protective equipment is supplied … all the personnel working on site.
3. Hard hats have to be worn all times … job site.
4. Hand gloves and hard soul shoes are recommended … cleaning operations.
5. Proper lighting should be … the site.
6. Construction project execution is impossible … proper health and safety management.

ЗАДАНИЕ 8. Ответьте на вопросы о мерах безопасности на строительной площадке.

1. Why are safety measures taken at the construction site?
2. When are hard hats worn?
3. What is the purpose of a safety vest?
4. What is first aid necessary for onthe site?
5. Who takes care of the weight lifting capacity?
6. What is construction project execution impossible without?

ЗАДАНИЕ 9. Подтвердите словами из текста, что:

1. При всех сварочных работах используются защитные очки и маски (safety glasses, face shields).
2. Маска от пыли используется при работе со стекловолокном (dust mask, fiberglass).
3. На строительной площадке необходимо наличие огнетушителей (fire extinguishers).
4. Водитель грузоподъемных механизмов отвечает за грузоподъемные мощности оборудования (weight lifting capacity).
5. Доступность первой помощи обязательна на строительной площадке (first aid).

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите следующие предложения.

1. Hard hats have to be worn …
   a) everywhere; b) at the job site.
2. Hard soul shoes are recommended …
   a) during cleaning operations; b) working at night.
3. … stickers with safety notes to be pasted where necessary.
   a) Red; b).Yellow .
4. Ground personnel should be …
   a) in machine operator's vision; b) in manager's vision.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Any construction site is a **d…** occupation. Personal **p…** equipment are supplied to all people working on site or visiting it. Hard **h…** are worn all times. Safety **g…** and face **s…** are required when operating any spark producing activity or during welding. Hand **g…** and hard soul **s…** are useful during cleaning or cutting. Safety **v…**keeps the person always clear in view. Hearing protection equipment

protects from loud **n…** . **D…** mask is supplied while working with fiber glass, cleaning or handling debris. Some basic safety precautions must be observed: **s…** working platforms, clean site, available first aid, fire **e…**, proper lighting, safety notes, careful work of a machine **o...** .

ЗАДАНИЕ 12. Расскажите о мерах безопасности на строительной площадке по следующему плану, используя слова, данные в скобках.

1. Personal protective equipment (hard hats, safety glasses, face shields, hand gloves, safety vests, hearing protection equipment, dust masks).
2. Basic safety precautions (safety notes, working platforms, first aid, fire extinguishers, heavy mechanical equipment).

Тексты для самостоятельной работы по теме “Technosphere Safety in Construction”

Text A

Прочитайте текст и выполните задание.

Fire Requirements to the Building Materials

Materials 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 different ways. It can be encased in brickwork or concrete, or protected by sprayed asbestos.

Timber of sufficient thickness is capable of withstanding fire for a longer period than unprotected steel under similar conditions. Fire-retardant emulsion paint and flame-retardant treatment for timber are developed to prevent spread of flame.

The ability of concrete to resist damage when exposed to high temperatures depends largely upon the properties of its aggregate.

Thermalite 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 the fire protection.

An essential element in the design of fire-resisting structures is the adequateprotection of all openings in walls and floors. In industrial buildings doors andarchways should be fitted with fire-resisting doors or shutters.

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.

Fire resistance is measured by the length of time an element of structure will resist a fire of a prescribed severity without failure

The coordinated policy of fire prevention is initiated at the planning stage of new buildings and maintained in use.

WRITING TASK

Подготовьте презентацию на английском языке о противопожарных требованиях, предъявляемых к строительным материалам, используя следующие фразы: It should be said that, as far as we know, first of all, it should be noted, we'd like to pay attention to.

Text B

Прочитайте текст и выполните задание

Construction Site Safety Tips

Fall Protection

Falls are the leading cause of fatalities in construction, accounting for nearly 40% of all worker deaths. Construction workers performing work on scaffolds and ladders are exposed to falls.

Employers should provide fall protection systems (guardrails, safety net systems and personal fall arrest systems) to protect their workers from falling. The workers should inspect the systems and be sure they are in good working condition and are free of damage.

Inspect all vehicles and lift components for a missing, damaged or defective element before operating. Employers should also have power lines de-energized when workers are in the vicinity.

Workers should never work on scaffolding covered in ice, water or mud and never exceed the maximum load. Defective ladders should be marked or taken out of service until they can be properly repaired.

A competent person provides training to all employees that might be exposed to fall hazards.

Personal Protective and Life Saving Equipment

Workers should be provided with personal protective and life saving equipment dealing with flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gasses or vapors, or potentially injurious light radiation.

Eye and face protection should be kept clean and in good repair. Workers should inspect their hard hats for any cracks and damages.

Toxic and Hazardous Substances

Certain building materials contain hazardous chemicals such as zinc, cadmium, beryllium and mercury.Employees should wear proper PPE when handling hazardous chemicals. All containers of hazardous substances must have a hazard warning and be labeled.

A competent person is required to provide inspections of job sites, equipment and materials. Employers are also responsible for safety and life of the construction workers.

WRITING TASK

1. Напишите эссе на английском языке об особенностях работы на строительной площадке, используя следующие фразы: as far as I know, to my opinion, I believe, I think, I consider.
2. Подготовьте презентацию на английском языке по основным правилам безопасности при работе на строительной площадке. *Construction site is a dangerous place.*

PART VI
ECONOMICS AND INNOVATION IN BUILDING

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. In modern society, economics is involved in all activities leading to the production of goods and services.

Innovation is considered a major driver of the economy. Innovation specialists in the field of construction are engaged in innovation business planning, marketing, management, industrial technologies and innovations. They deal with evaluation of the effectiveness and competitiveness of innovative technologies, their development and design, and introduction to the market with the help of modern marketing tools.

1. What are the features of the profession of specialist in innovation?
2. What problems does Economics deal with?
3. When did the development of modern economics begin?

UNIT 1
Economics and Finance

"There is always plenty of business, if you are smart enough to get it"
E.W. Hove (1853-1937), American writer

Text 1
Economics as a Science

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: economy, Economics, discipline, contribution, nation, system, service, information, activities, type, computer, action, stability, resources;
b) прилагательные: economic, central;
c) глаголы: publish, analyse, organize, coordinate, produce.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Economics is **a scholarly discipline** studying economy.
2. Adam Smithmade **extraordinary contributions** in Economics.

3. Prices and markets are able to **coordinate people** and business without any central direction.
4. Information is an important part of **decision – making** in economy.
5. Economics studies how societies use **scarce resources** to produce valuable commodities.

In English two terms are used: **"economy"** and **"Economics".** The first includes everything that relates to the economic life of the country (its factories, roads, shops, people who produce and consume goods, and these goods). The second is the science that deals with the study of the economy.

ЗАДАНИЕ 3. Выберите слово и вставьте в предложение:
economy, Economics, economic, economical, economist, economically

1. Max and Keynes are two famous ... .
2. Those people are studying the science of … .
3. We sometimes call a person's work his ... activity.
4. People should be very ... with the money they earn.
5. The ... system of a country is usually called the national ... .
6. The people in that town live very ... .

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **Economics** – экономика (наука)
2) **commodity** – товар
3) **to deal with** – заниматься чем-либо
4) **earning** – заработок, доход
5) **distribution** – сбыт, распределение
6) **source** – источник
7) **consumption** – потребление
8) **production -** производство
9) **make decisions** – принимать решения
10) **a goal** – цель, задача
11) **justice** – справедливость
12) **scarce** – ограниченный
13) **goods** – товары
14) **wealth** – богатство, материальные ценности
15) **equitable –** справедливый
16) **income –** доход
17) **price –** цена
18) **employment –** занятость
19) **sale -** продажа

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Economics as a Science

Economics is a social science studying economy. As a scholarly discipline, economics is two centuries old. The first scientist who made extraordinary contributions in Economics was Adam Smith. Smith devoted 10 years to writing his work "The Wealth of Nations" which founded economic science. It was published in 1776. His contribution was to analyse the way that markets organized economic life and produced rapid economic growth. He showed that a system of prices and markets is able to coordinate people and business without any central direction.

Economics is often said to deal with earning, distribution and use of all kinds of wealth. Wealth is made up of goods and services. Goods are actual things people use. Goods can be seen and felt by those who use them.

Economics involves much more than wealth in the form of goods and services. For example, when people buy and sell goods and services, they make use of information. People also become a source of information to others. Information helps people to make decisions in their economic activities. Your decision to buy a certain type of computer is based on information you received about it. Before you use the services of a doctor, you try to find out something about him or her. Later you will pass your experience with the computer or the doctor to others. Information is an important part of decision - making.

Economics is concerned with many things besides information. It deals, among other things, with the following:

- Production or the making of goods and wealth.
- Distribution, or the giving out and exchange of goods and wealth.
- Performing of services. These include sale, repair and training.
- Consumption or the use of goods and services.
- Actions of governments. Such actions often affect the production and distribution of goods and wealth.
- Actions and events in the world. These can affect decisions made by people and governments.
- Goals of society. Some societies favour growth, others stability. Economic justice, freedom and security are other goals.

There are four major economic goals that are generally accepted. These goals are: full employment; price stability; economic growth; an equitable distribution of income.

Economics is the study of how societies use scarce resources to produce valuable commodities and distribute them among different people.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) покупать и продавать	a) wealth in the form of goods and services
2) общественная наука	b) rapid economic growth
3) источник информации	c) buy and sell
4) экономическая деятельность	d) a source of information
5) быстрый экономический рост	e) economic activities
6) влиять на производство	f) performing of services
7) оказание услуг	g) scarce resources
8) материальные ценности в форме товаров и услуг	h) a social science
9) ограниченные ресурсы	i) affect the production

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Economics is a social science …	a) and use of all kinds of wealth.
2. Adam Smith was the scientist …	b) of goods and services.
3. Economics deals with earning, distribution …	c) studying economy.
4. Wealth is made up …	d) of decision - making.
5. Information is an important part …	e) who founded economic science.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Smith devoted 10 years … writing his work.
2. Economics deals … earning, distribution and use of all kinds of wealth.
3. Wealth is made … of goods and services.
4. Your decision to buy a certain product is based … information about it.
5. Economics studies how to produce commodities and distribute them … different people.
6. Before buying a product people try to find … something about it.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Economics is …
   a) three centuries old; b) two centuries old.
2. Adam Smith. Smith devoted 10 years to writing his work …
   a) "The Wealth of Nations"; b) the "The Capital».
3. Wealth is made up of …
   a) gold and silver; b) goods and services.

4. Information helps people to …
   a) make decisions in their economic activities; b) change their lives.
5. Economics is the study of …
   a) mathematics; b) choice.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Адам Смит сделал выдающийся вклад в экономическую науку.
   (Adam Smith made extraordinary contributions in Economics. His work"The Wealth of Nations" founded economic science.)
2. Информация – важная часть в процессе принятия экономического решения.
   (Information is an important part of decision - making. It helps people to make decisions in their economic activities.)
3. Экономическая наука занимается проблемами производства, распределения, сбыта и другими.
   (Economics is concerned withproduction, distribution, consumption of goods and services and others.)
4. Основные проблемы любого общества – полная занятость, ценовая стабильность, экономический рост и справедливое распределение доходов.
   (Major economic goals of any society are full employment, price stability, economic growth, an equitable distribution of income.)
5. Экономическая наука изучает, как общество использует ограниченные ресурсы для производства товаров, и распределяет их.
   (Economics is the study of how societies use scarce resources to producecommodities and distribute them among different people.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Economics is a social **s**… studying economy. Economics deals with earning, **d**… and use of all kinds of wealth. Information helps people to **m**… decisions in their economic activities. Performing of services includes **s**…, repair and training. Actions of governments can affect the **p**… and distribution of goods and wealth. Some societies favour **g**…, others stability. Economics studies how societies use **s**… resources to produce commodities.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What does Economics deal with? (earning, distribution, wealth)
2. When did Economics appear? (two centuries old)
3. Who made extraordinary contributions in economics? (Adam Smith)
4. When was the Adam Smith's "The Wealth of Nations" published? (1776)

5. What was the subject of A. Smith's analysis? (markets, economic growth)
6. What is wealth made up? (goods and services)
7. How do people make use of information? (make decisions, economic activities)
8. What other things besides information is Economics concerned with? (production, distribution, consumption, performing of services, actions of governments)
9. What are major economic goals generally accepted? (full employment, price stability, economic growth, an equitable distribution of income)
10. What is the difference between terms "economy" and "economics" in English? (the economic life of the country, the science)
11. Do you know the names of scientists studying economics? (David Ricardo, Thomas Malthus, John Mill, John Keynes, Karl Marx, Irving Fisher)

ЗАДАНИЕ 13. Расскажите об экономической науке по следующему плану, используя слова, данные в скобках.

1. Economics as a scholarly discipline (economy, scarce resources, commodities).
2. Economics development (two centuries old, Adam Smith, "The Wealth of Nations").
3. Adam Smith's contribution to Economics (markets, system of prices, economic life, rapid economic growth).
4. Areas of Economics study (earning, distribution, use of wealth).
5. The role of information in economic activities (decision – making, people).
6. The problems of production, distribution and consumption in Economics (goods and wealth, services).
7. Goals of society (employment, price stability, growth, distribution of income).

Text 2
Construction Economics

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: Economics, activities, specialist, transport, industry, contribution, standard, characteristic, nature, firm, area, resources, factor, capital, problem, economist, investment, productivity, inefficiency, practice, technology, sector;
b) прилагательные: financial, agricultural, ecological, international, unique, physical, geographical, complex, efficient;
c) глаголы: examine, dominate, determine, maximize, identify, demonstrate, innovate.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Many people in the twenty-first century examine **construction economics**.
2. Factors of production are land, labour, capital and **enterprise**.
3. Economics is faced with a problem of **scarcity**.
4. To solve many economic problems people must make careful **choices**.
5. One of the problems in the construction industry is **the level of productivity**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, какие области изучает экономическая наука.

Образец: *In the twenty-first century people examine <u>construction economics</u>.*

1. In the twenty-first century people examine …	a) transport economics b) health economics c) business economics d) financial economics e) agricultural economics f) labour economics g) international economics h) ecological economics i) economic security
2. In the twenty-first century scientists examine …	

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **to involve** – вовлекать, затрагивать
2) **a range –** ряд, диапазон
3) **to evolve out** – выходить, развиваться
4) **distinct –** особый, отличный
5) **expensive –** дорогой
6) **nature –** свойство
7) **to dominate –** управлять, контролировать
8) **demand –** спрос, требование
9) **to be concerned with –** касаться
10) **allocation –** распределение
11) **scarcity –** экономия
12) **behalf –** интерес, польза
13) **output –** выпуск
14) **to identify –** отождествлять, устанавливать тождество
15) **to restrict –** ограничивать
16) **to innovate –** вводить новшества

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Construction Economics

In modern society, Economics is involved in all activities leading to the production of goods and services. Consequently a range of specialists have evolved out of mainstream Economics, such as transport economics, health economics, business economics, financial economics, agricultural economics, labour economics, international economics and, even, ecological economics. Hence it is not particularly surprising that many people in the twenty-first century examine construction economics.

Construction economics as a specialized branch of economics is accounted for by the size of the construction industry, its profound contribution to a nation's standard of living and its products' unique characteristics. The construction industry has three distinct qualities.

- The physical nature of the product is large, heavy and expensive.
- The construction industry is dominated by a large number of relatively small firms, spread over a vast geographical area.
- Demand for activity within the industry is directly determined by the general state of the economy as a whole.

Construction Economics – like pure economics, is concerned with the allocation of scarce resources. This is far more complex that it at first appears. Many of the world's resources (factors of production such as land, labour, capital and enterprise) are finite, yet people have infinite wants. We are, therefore, faced with a problem of scarcity. In an attempt to solve this problem, economists argue that people must make careful choices – choices about what is made, how it is made, and for whom it is made; or in terms of construction, choices about what investments are made, how these are constructed and on whose behalf. Indeed, at its very simplest level, Economics is "the science of choice".

Therefore, the study of Economics (and construction economics) is concerned with making efficient use of limited resources to maximize output and satisfy the greatest possible number of wants.

One of the problems in the construction industry is the level of productivity which needs to improve. Several problems are identified as the root cause of this inefficiency. First, the construction industry demonstrates a poor safety record and inability to recruit good staff. Second, there is the poor level of investment into research and development that restricts the industry's ability to innovate and learn from best practice. The third problem is the fact that modern technology is not used widely enough across the construction sector.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) чрезвычайный вклад	a) mainstream Economics
2) специализированная отрасль	b) production of goods and services
3) основная экономика	c) profound contribution
4) следовательно, вследствие	d) the general state
5) общее состояние	e) scarce resources
6) ограниченные ресурсы	f) as a whole
7) производство товаров и услуг	g) consequently
8) как целое, в целом	h) the root cause
9) основная причина	i) a specialised branch

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Construction Economics is concerned with …	a) demand for activity within the construction industry.
2. The construction industry is dominated by …	b) are finite.
3. The general state of the economy determines …	c) the allocation of scarce resources.
4. Many of the world's resources …	d) the level of productivity.
5. One of the problems in the construction industry is …	e) a large number of small firms.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. All activities in Economics lead … the production of goods and services.
2. A range of specialists have evolved … of mainstream Economics.
3. Construction economics is accounted … by the size of the construction industry, its contribution to a nation's economy.
4. The construction industry is dominated … a large number of small firms.
5. The general state of the economy determines the demand for activity … the industry.
6. We are faced … a problem of scarcity.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Construction economics is accounted for by …
   a) the size of the construction industry; b) the modern technology.
2. The construction industry has …
   a) two; b) three distinct qualities.

3. Many of the world's resources are …
   a) finite; b) infinite.
4. The construction industry demonstrates…
   a) ability; b) inability to recruit good staff.
5. Modern technology …
   a) is not used widely in the construction sector; b) is used widely in the construction sector.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. В современном обществе экономика участвует во всех видах деятельности, связанных с производством товаров и услуг.
   (In modern society, Economics is involved in all activities leading to the production of goods and services.)
2. Экономика строительства объясняется размером строительной отрасли, ее чрезвычайным вкладом в уровень жизни станы и уникальными характеристиками ее продукции.
   (Construction economics is accounted for by the size of the construction industry, its profound contribution to a nation's standard of living and its products' unique characteristics.)
3. Экономика строительства, как и общая экономика, занимается распределением ограниченных ресурсов.
   (Construction Economics – like pure economics, is concerned with the allocation of scarce resources. Many of the world's resources are finite.)
4. Экономика – это «наука выбора».
   (Economics is "the science of choice". We are faced with a problem of scarcity.)
5. Изучение экономики строительства связано с эффективным использованием ограниченных ресурсов для максимизации объема производства и удовлетворения максимально возможного количества потребностей.
   (The study of construction economics is concerned with making efficient use of limited resources to maximize output and satisfy the greatest possible number of wants.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Economics deals with all activities leading to the **p**… of goods and services. Many people in the twenty-first century examine **c**… economics.Construction economics is a **s**… branch of economics. It is accounted for by the size and its profound **c**… to a nation's standard of living. The physical nature of the **p**… of construction industry is large, heavy and expensive. Construction firms **s**… over a vast geographical area. People are faced with a **p**… of scarcity. Modern **t**… is not used widely enough across the construction sector.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What does Economics lead to in modern society? (production of goods and services)
2. What specialists have evolved out of mainstream Economics? (transport economics, health economics, business economics, financial economics, agricultural economics, labour economics, international economics, ecological economics)
3. Why do many people examine construction economics in the twenty-first century? (a specialized branch, the size, standard of living, products' characteristics)
4. What distinct qualities does the construction industry have? (expensive, demand for activity, product)
5. Why is Construction Economics concerned with the allocation of scarce resources? (finite, scarcity, careful choices)
6. What is the study of construction economics concerned with? (efficient use of limited resources, output, satisfy)
7. What are the problems in the construction industry? (the level of productivity, inefficiency, modern technology)

ЗАДАНИЕ 13. Расскажите об экономике строительства по следующему плану, используя слова, данные в скобках.

1. Economics in modern society (activities, production of goods and services).
2. A range of specialists evolved out of mainstream Economics (transport economics, health economics, business economics, financial economics, agricultural economics, labour economics, international economics, ecological economics).
3. Construction economics as a specialized branch of economics (the size of the construction industry, contribution to a nation's standard of living, products' unique characteristics).
4. Three qualities of the construction industry (nature of the product, small firms, demand for activity).
5. The problem of scarce resources in Construction Economics (finite, scarcity, choices).
6. The current problems in the construction industry (productivity, inefficiency, modern technology).

Тексты для самостоятельной работы по теме «Economics and Finance»

Text A

Прочитайте текст и выполните задание.

Tax System

Taxation is the system of getting money for the needs of the state by means of the taxes. Many kinds of taxes have been used and are being used throughout the world.

The main taxes can be divided into paid on income and capital, called "direct" taxes and those paid when money is spent, called "indirect" taxes. Income tax redistributes wealth from the rich toward the poor (via social programmes). Generally it is a progressive tax: more is paid as income rises. Indirect taxes are paid on goods and services. The taxes are paid by the shops or manufacturers, but then passed on to the consumers in the form of higher prices.

In the United Kingdom, for example, the value added tax or VAT is the most important indirect tax. The advantage of this tax is that it is directly in line with inflation. If the prices rice, so does the tax. However, the burden of this tax falls more heavily on the poor. For a number of industrial nations, the value added tax (VAT) is an important source of revenue.VAT is paid every time value is added to an item as it moves along the chain of production.

There is no VAT in the United States at the present time, but some people favour its use. In support of their position, they make the following points:

1. Since VAT is paid at each stage of production, it is relatively easy for government to collect and difficult to evade.
2. VAT can give a lot of revenue.
3. Because the tax is hidden from the consumers, who really pay it, there is less opposition to it.

Those opposing the VAT argue that:

1. It is regressive. Like any sales tax, it falls more heavily on the poor than on the rich taxpayer.
2. Hidden taxes are unfair taxes.
3. The VAT increases prices (by the amount of the tax).

There are some principles in taxation. The tax system should be simple. Both those who pay taxes and those who collect them must understand the tax laws.The system should be stable so that the taxpayer knew in advance that he must pay the tax to be able to save money for it.

The next principle is the principle of elasticity. It should be possible to expand the tax system to collect more money, when the government must spend more money and to reduce the amount of taxes in normal times, when government expenditures are at minimum.

The government of a country needs to raise taxes in order to provide goods and services. This category includes defense spending, law enforcement, health, and education.

Another part of governmental spending is allocated to caring for those who do not have an income. The very poor, the unemployed, the dependent children are provided for out of taxation.

The countries with the lowest tax in the world are Bahrain, Brunei, Kuwait and Qatar (where there is no tax at all). The highest taxation rate is in Norway.

WRITING TASK

Напишите эссе на английском языке на тему “Tax System in Russia”.

Text B

Прочитайте текст и выполните задание.

Economics of Education

Education varies from country to country but it has the same economic characteristics in all countries. It improves skills which make people more productive. By means of education people do creative research which helps to improve technology. Education creates large economic values varying from technical productivity in factories and offices to progress of knowledge.

Various values of education are of two groups: private and social. Each student gets private benefits when he or she learns new skills which will allow them to get a well-paid job. Besides, the job will probably be more pleasant.

There are also public benefits of education. First, it provides more productive workers for society; economy becomes more efficient and profitable. Without education many people do not cope with difficulties of life. Second, people understand social life better. Third, greater productivity of population provides more taxes in order to pay for public needs.

The task of economics of education is to evaluate public and private benefits and make decisions how much a government is going to invest in every type of education. The government is raising the level of financing education.

Technologies are becoming more complex and demand for education as well as a number of qualified specialists will grow in future. The role of economics of education and the scope of problems studied by it is growing from year to year.

WRITING TASK

Подготовьте презентацию на английском языке на тему “The Value of the Economy to Education”.

Unit 2
Innovation

Text 1
What Is Innovation?

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: innovation, parameter, specification, material, technology, process, idea, method, concept, type, business, model, design, organization, structure, practice, characteristic, product, phase;
b) прилагательные**:** positive, technical, financial, basic, progressive, commercial.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Quality **requirements** make the mankind to go for innovations.
2. The **goal** of innovation is positive change.
3. Innovation **refers** to the use of a new idea or method.
4. Organizational innovation is the **creation** of business structures.
5. Ideas are **generated** in the invention phase.
6. In the market penetration phase ideas are **exploited** for commercial gain.

ЗАДАНИЕ 3. Познакомьтесь со словами и словосочетаниями, которые помогут понять текст:

1) **quality** – качество
2) **to develop** – развивать, разрабатывать
3) **improvement** – улучшение, усовершенствование
4) **to introduce** – внедрять
5) **invention** – изобретение
6) **to change** – изменять
7) **implementation** – воплощение
8) **to select** – выбирать, делать отбор
9) **penetration** – проникновение
10) **gain** – выгода, прибыль

ЗАДАНИЕ 4. Прочитайте и переведите текст.

What Is Innovation?

Changing requirements, parameters, size of works, specifications, quality requirements make the mankind to go in for innovations and develop new materials, equipment and technologies.

According to one of the definitions innovation is the process of making improvements by introducing something new. The goal of innovation is positive change, to make someone or something better. Innovation differs from invention in that innovation refers to the use of a new idea or method, whereas invention refers more directly to the creation of the idea or method itself.

The concept of innovation implies different types of innovation including the following.

- Business model innovation – changing the way business is done.
- Marketing innovation – development of new marketing methods with improvement in product design, packaging, promotion or pricing.
- Organizational innovation – the creation of business structures, practices and models.
- Process innovation – the implementation of a new or improved production or delivery method.
- Product innovation – the introduction of a new good with improved functional characteristics or technical abilities.
- Service innovation – similar to product innovation but relates to services.
- Supply chain innovation – improvement in delivery of input products from suppliers and output products to customers.
- Financial innovation – development of basic financial attributes (ownership, risk-sharing, liquidity, credit) in progressive innovative ways.

We can describe three phases in the innovation process: 1) the invention phase, in which ideas are generated; 2) the implementation phase, in which the best ideas are selected and developed further; 3) the market penetration phase, in which ideas are exploited for commercial gain.

ЗАДАНИЕ 5. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

изменение требований, развивать технологии, процесс усовершенствования, создание самого метода, продвижение, усовершенствованное производство, технические возможности, поставщики, покупатели, проникновение на рынок, коммерческая выгода.

ЗАДАНИЕ 6. Соедините части предложений по смыслу**.**

1. Changing requirements makes the mankind …	a) improvement in delivery from suppliers to customers.
2. Innovation is the process of …	b) to develop new materials.
3. Innovation refers to …	c) the introduction of new goods with improved characteristics.
4. Marketing innovation is …	d) making improvements by introducing something new.
5. Supply chain innovation is …	e) development of new marketing methods.
6. Product innovation …	f) the use of a new idea or method.

ЗАДАНИЕ 7. Вставьте необходимые предлоги.

1. Innovation is the process of making improvements … introducing something new.
2. Innovation refers to the use … a new idea or method.
3. Marketing innovation is the development of new marketing methods … improvement in product design, packaging, promotion or pricing.
4. Supply chain innovation is the improvement in delivery of input products … suppliers and output products … customers.
5. We can describe three phases … the innovation process.

ЗАДАНИЕ 8. Ответьте на вопросы об основных понятиях инновации.

1. What makes the mankind to develop new technologies?
2. What is innovation?
3. What is the goal of innovation?
4. What is the main difference between innovation and invention?
5. What are the types of innovation?
6. Can you characterize three phases in the innovation process?

ЗАДАНИЕ 9. Подтвердите словами из текста, что:

1. Объем работ, требования к качеству заставляют человечество изобретать новые материалы и технологии (size of works, quality requirements).
2. Цель инновации – перемены к лучшему (the goal, to make better).
3. Инновация отличается от изобретения (refers to the use, to the creation).
4. Инновации в сфере производства и обслуживания сходны (similar).
5. В процессе инновации важны три фазы (the invention, the implementation, the market penetration).

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите следующие предложения.

1. Innovation is the process of …
   a) making improvements; b) producing goods.
2. Innovation refers to …
   a) the creation of the idea or method itself; b) the use of a new idea or method.
3. Marketing innovation is …
   a) the implementation of a new or improved production or method;
   b) development of new marketing methods.
4. Organizational innovation is …
   a) the creation of business structures, practices and models; b) changing the way business is done.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

New parameters, specifications, quality requirements make the mankind to **d…** new materials, equipment and technologies. Innovation is the process of making **i…** by introducing something new.The goal of innovation is positive **c…** . Innovation refers to the **u…** of a new idea or method. Innovation implies different types: business model, **m…**, organizational, process, product, **s…**, supply chain, **f…** . There are three **p…** in the innovation process: the invention, the **i…** and the market penetration phase.

ЗАДАНИЕ 12. Расскажите об основных типах инновации и фазах инновационного процесса по следующему плану, используя слова, данные в скобках.

1. Reasons for innovation (changing requirements, parameters, size of works, specifications).
2. The definition of the innovation (improvements, new).
3. The goal of the innovation (positive change, to make better).
4. The types of innovation (business model, marketing, organizational, process, product, service, supply chain, financial).
5. The phases in innovation process (invention, implementation, market penetration).

Text 2
Innovations in Construction

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: progress, management, system, energy, progress, computer, control, resources, problem, ecology, transport, sector, economy, product, structure, industry, mechanization;
b) прилагательные: economical, natural, technological, human, effective;
c) глаголы: to minimize, to base.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Innovations are **introduced** to all spheres of our life.
2. The materials and equipment should be **eco-friendly** to natural environment.
3. The mechanisms **replaced** the work of people.
4. Innovations in construction can be **divided** into managerial and technological.
5. Management innovations **include** the application of effective construction management methods.

ЗАДАНИЕ 3. Познакомьтесь со словами и словосочетаниями, которые помогут понять текст:

1) **to enhance** – повысить, улучшить
2) **achievement** – достижение
3) **to facilitate** – облегчить
4) **to solve** – решить
5) **to require** – требовать
6) **to increase** – увеличить
7) **scientific** – научный
8) **demand** –спрос
9) **profitability** – прибыльность
10) **to take into account** – принять во внимание
11) **advanced** – передовой
12) **experience** – опыт

ЗАДАНИЕ 4. Прочитайте и переведите текст.

Innovations in Construction

Progress never stops; innovations are being rapidly introduced to all spheres of our life, especially construction business.

The materials and equipmentwe choose to construct our buildings should enhance safety, minimize pollution, be economical, eco-friendly to natural environment and aesthetically better. The buildings should have good waste management system, water conservation and use less of artificial energy.

Firstly, the achievements of technological progress facilitate the work of people, and somewhere they can even replace human resources.

Secondly, innovations solve some problems. They may be associated with the production, ecology, transport or household life. Innovative solutions are required everywhere.

Construction is one of the rapidly changing progressive sectors of the economy, characterized by constantly increasing rates of technology change.Innovations in construction are the creation of construction products based on scientific and technical developments. Innovations must have a scientific and technical novelty, market demand and profitability.

Innovations in construction can be divided into managerial and technological.

Managerial innovations take into account the advanced experience of the construction industry and include the application of effective construction management methods and organizational structures of construction organizations.

Technological innovations in construction are divided into product: new materials, products, structures and equipment; and process: new technologies and means of mechanization.

ЗАДАНИЕ 5. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

улучшить безопасность, быть экологичным для окружающей среды, система управления отходами, сохранение воды, связаны с производством, постоянно растущие темпы, техническая новинка, управленческий, передовой опыт, средства механизации.

ЗАДАНИЕ 6. Соедините части предложений по смыслу.

1. Innovations are rapidly introduced to …	a) market demand and profitability.
2. The materials and equipment should be …	b) replace human resources.

3. The buildings should use …	c) all spheres of our life.
4. The achievements of technological progress can …	d) constantly increasing rates of technology change.
5. Construction is characterized by …	e) aesthetically better.
6. Innovations must have …	f) less of artificial energy.

ЗАДАНИЕ 7. Вставьте необходимые предлоги.

1. Innovations are being rapidly introduced … all spheres of our life.
2. The achievements … technological progress facilitate the work of people.
3. Innovations may be associated … the production, ecology, transport or household life.
4. Construction is characterized … constantly increasing rates of technology change.
5. Innovations in construction is based … scientific and technical developments.
6. Technological innovations in construction are divided … product and process.

ЗАДАНИЕ 8. Ответьте на вопросы об особенностях инноваций в строительстве.

1. What is rapidly introduced to all spheres of our life?
2. What requirements should the materials and equipment meet?
3. What do the achievements involve?
4. What are the innovations in construction based on?
5. How can innovations in construction be divided?
6. What are managerial innovations?
7. What do technological innovations include?

ЗАДАНИЕ 9. Подтвердите словами из текста, что:

1. К материалам и оборудованию предъявляются высокие требования (enhance safety, minimize pollution, be economical, eco-friendly to natural environment and aesthetically better).
2. Достижения технологического прогресса приводят к существенным переменам (facilitate the work, replace human resources).
3. Инновации могут решить проблемы в разных отраслях жизни (the production, ecology, transport, household life).
4. Инновации в строительстве могут быть двух видов (managerial, technological).
5. Управленческие инновации предполагают новшества в структуре управления (effective construction management methods, organizational structures of construction organizations).

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите следующие предложения:

1. Technological progress …
   a) facilitates the work; b) stops the work.
2. Innovations …
   a) create difficulties; b) solve some problems.
3. Construction is one of the … sectors of the economy.
   a) regressive; b) progressive.
4. Managerial innovations … the advanced experience of the construction industry.
   a) take into account; b) ignore.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Innovations are rapidly **i…** to all spheres of our life. The materials and equipment should **e…** safety, **m…** pollution, be economical, **e…** and aesthetically better. The achievements of technological progress **f…** the work of people and can **r…** human resources. Innovative solutions are **r…** in the production, ecology, transport, household life. Innovations in construction must have a scientific and technical novelty, market **d…** and profitability. Innovations in construction can be divided into **m…**- the application of effective construction management methods and organizational structures - and **t…** - new materials, products, equipment, technologies and means of mechanization.

ЗАДАНИЕ 12. Расскажите об инновациях в строительстве по следующему плану, используя слова, данные в скобках.

1. The requirements to the new materials, equipment and buildings (safety, minimize pollution, economical, eco-friendly, less of artificial energy).
2. The role of the achievements (facilitate the work, replace human resources).
3. Problems which innovations solve (the production, ecology, transport, household life).
4. The basics of innovations (scientific and technical developments, market demand, profitability).
5. The classification of innovations in construction (managerial, technological).
6. Managerial innovations (advanced experience, effective construction management methods).
7. Technological innovations (new materials, products, structures and equipment, new technologies and means of mechanization).

Тексты для самостоятельной работы по теме “Innovation”

Text A

Прочитайте текст и выполните задание.

Important Tips for Innovations

Construction Materials

Building materials constitute about 40 % of the project cost in construction projects. Therefore it becomes necessary that the materials should be used more efficiently. Innovation in respect of the materials should be done considering the requirements and suitability in the project:

- acceptance of building materials – they should be accepted by the construction industry and the end user;
- economy of materials – which is an essential requirements of any activity. The new materials which are economical in use will be accepted more.
- sustainability of building materials - one of the factor affecting this criteria is non availability for a long period of time;
- using local resources – the advantage will be saving on the transport cost and easy availability;
- future modification potential - the new material should have quality of changing as on the need;
- environment friendly- the new material should not have adverse effect on the environment.

Equipment and Machinery

Equipments produce output at accelerated speed, and enables performance of tasks in shorter time. Equipments improve productivity, quality and safety. Innovated equipment should posses some important features: easy to use, easy to maintain, be economical, sustainable, multifunctional, flexible, safe, energy saving, least polluting, have future modification potential.

WRITING TASK

1. Напишите эссе на английском языке о необходимости использования инновационных материалов в строительстве.
2. Подготовьте презентацию на английском языке об особенностях инноваций применительно к строительным материалам, оборудованию и технике, работающей на строительной площадке.

Text B

Прочитайте текст и выполните задание.

Innovations in Construction Technology

Construction is one of the branches of civil engineering that is concerned directly with common people. Buildings have been built for a long time but with the differences in technology. The first buildings were simple and just for the purpose of shelter. They were made from stones and mud but in recent time we construct buildings using multiple types of materials including stone, timer, concrete, metals, glass, etc.

Types of construction technologies

Construction industry includes a wide range of constructions suitable for all classes of society: commercial, domestic, industrial, heavy or civil constructions, etc. Each of these requires different technological treatments. For domestic construction, simple technological methods are usually preferred and frequently available materials are mostly used. In commercial construction, the basic concern is infrastructure that is responsible for strength and life of project.

Role of technology in building designs

Construction industry has passed through advancements. One of them is focused on designing buildings before constructing them. Progress in technology has introduced successful techniques to develop strong and long-lasting buildings. Building Information Modeling (BIM is one of such computerized systems that facilitate for collecting information about buildings under construction on regular basis. This system greatly enhances the communication among engineers and designers that are working on the project.

Innovations in construction technology

Technological progress has introduced many innovations in field of construction industry. Most of the building parts such as pillars, roofs and concrete blocks are available in prepared forms that increase the speed of construction process greatly. Use of pre-stressed concrete units strengthens the buildings along with speedy construction.

Green construction

The green revolution has also some effects on this industry. It means while constructing buildings natural environment should not be spoiled and materials used for building must be eco-friendly. This concept should be implemented to all types of construction including domestic as well as commercial construction.

<u>WRITING TASK</u>

1. Напишите эссе на английском языке о роли, которую играет инновация в строительстве.
2. Подготовьте презентацию на английском языке о технологических инновациях в строительстве.

Unit 3
Management and Business

Text 1
Management

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: management, administration, organization, business, activity, strategy, resource, mission, procedure, manipulation, capital, motivation, progress, system, equivalent, commerce, effectiveness, corporation, perspective;
b) прилагательные: financial, natural, technological, human, collective, effective;
c) глаголы: manage, organize, coordinate, identify, plan, command, control, maximize, contrast.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Management is the administration of an organization, whether it is a business, a **not-for-profit organization**.
2. Management includes **the activities** of an organization and coordinating the efforts of its employees to accomplish its **objectives**.
3. Management involves **identifying the mission**, **objective**, **procedures**, rules and **manipulation of the human capital** of an enterprise to contribute to the success of the enterprise.
4. Management consists of five main functions: **planning** (forecasting), **organizing**, **commanding**, **coordinating**, **controlling**.
5. Historically this use of **the term often contrasted** with **the term "labour"** – referring to those being managed.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, определите основные цели и задачи менеджмента.

Образец: *Management consists of five main functions: planning (forecasting), organizing, commanding, coordinating, controlling.*

1. Management is …	a) planning, organizing, coordinating, leading and controlling
2. Management includes …	b) planning (forecasting), organizing, commanding, coordinating, controlling
	c) identifying the mission, objective, procedures, rules

3. Management involves …	and manipulation of the human capital of an enterprise to contribute to the success of the enterprise
4. Management consists of five main functions: …	d) the activities of setting the strategy of an organization and coordinating the efforts of its employees to accomplish its objectives through the application of available resources
5. Management is the process of …	e) the administration of an organization, whether it is a business, a not-for-profit organization.

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **government**, n – правительство
2) **effort**, n – усилие, старание, стремление
3) **accomplish**, v – выполнять, совершать, достигать
4) **purpose**, n – цель, задача, назначение
5) **employee**, n – служащий, работник
6) **objective**, n – цель, задача
7) **imply**, v – подразумевать, означать, предполагать
8) **enterprise**, n – предприятие, компания, фирма
9) **perform**, v – выполнять, осуществлять, совершать
10) **environment**, n – окружающая среда, обстановка
11) **contribute**, v – способствовать
12) **outcome**, n – результат, итог
13) **charity**, n – благотворительная деятельность
14) **involve**, v – вовлекать, задействовать, затрагивать
15) **consist**, v – состоять

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Management

Management (or managing) is the administration of an organization, whether it is a business, a not-for-profit organization, or government body. Management includes the activities of setting the strategy of an organization and coordinating the efforts of its employees (or of volunteers) to accomplish its objectives through the application of available resources, such as financial, natural, technological, and human resources. The term "management" may also refer to those people who manage an organization.

Management involves identifying the mission, objective, procedures, rules and manipulation of the human capital of an enterprise to contribute to the success of the enterprise. This implies effective communication: an enterprise environment (as

opposed to a physical or mechanical mechanism) implies human motivation and implies some sort of successful progress or system outcome.

From this perspective, Henri Fayol (1841–1925) considers management to consist of five functions: 1) planning (forecasting); 2) organizing; 3) commanding; 4) coordinating; 5) controlling.

One habit of thought regards management as equivalent to "business administration" and thus excludes management in places outside commerce, as for example in charities and in the public sector. More broadly, every organization must "manage" its work, people, processes, technology, etc. to maximize effectiveness.

English-speakers may also use the term "management" or "the management" as a collective word describing the managers of an organization, for example of a corporation. Historically this use of the term often contrasted with the term "labour" – referring to those being managed.

Management on the whole is the process of planning, organizing, coordinating, leading and controlling.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) некоммерческая организация	a) outside commerce
2) доступные средства (ресурсы)	b) labour
3) максимизировать эффективность	c) an enterprise environment
4) управление	d) forecasting
5) эффективное взаимодействие	e) effective communication
6) прогнозирование	f) human capital
7) внешняя торговля	g) manipulation
8) рабочая сила	h) objective
9) цель, задача	i) available resources
10) государственный орган	j) government body
11) государственный (бюджетный) сектор	k) not-for-profit organization
12) благотворительные организации (общества)	l) charities
13) корпоративная среда	m) public sector
14) человеческий капитал (потенциал)	n) to maximize effectiveness

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Management includes the activities of …	a) planning (forecasting), organizing, commanding, coordinating, controlling.
2. The term "management" may also refer to …	b) the process of planning, organizing, coordinating, leading and controlling.
3. Management consists of five main functions: …	c) those people who manage an organization.

4. Every organization must "manage" its work, people, processes, technology, etc. …	d) setting the strategy of an organization and coordinating the efforts of its employees to accomplish its objectives through the application of available resources, such as financial, natural, technological, and human resources.
5. Management on the whole is …	e) to maximize effectiveness.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Management includes the activities … setting the strategy … an organization and coordinating the efforts … its employees to accomplish its objectives … the application … available resources.
2. An enterprise environment (as opposed … a physical or mechanical mechanism) implies human motivation and implies some sort … successful progress or system outcome.
3. … this perspective, Henri Fayol (1841–1925) considers management to consist … five functions.
4. English-speakers may also use the term "management" … a collective word describing the managers of an organization.
5. Management … the whole is the process … planning, organizing, coordinating, leading and controlling.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Management is the administration of an … .
   a) organization; b) activity.
2. Management … the activities of setting the strategy of an organization and coordinating the efforts of its employees to accomplish its objectives through the application of available resources.
   a) includes; b) excludes.
3. Management involves identifying the mission, objective, procedures, rules and manipulation of the human capital of an enterprise to contribute to the …
   a) physical or mechanical mechanism; b) success of the enterprise.
4. Henri Fayol (1841–1925) considers management to consist of … : planning, organizing, commanding, coordinating, controlling.
   a) five functions; b) five resources.
5. Management on the whole is … of planning, organizing, coordinating, leading and controlling.
   a) the public sector; b) the process.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Менеджмент – это управление любой организацией.
   (Management is the administration of an organization.)
2. Менеджмент способствует успеху предприятия.
   (Management contributes to the success of the enterprise.)
3. Управление состоит из пяти основных функций.
   (Management consists of five main functions.)
4. Каждая организация должна "управлять" своей работой, сотрудниками, процессами, технологиями для максимальной эффективности.
   (Every organization must "manage" its work, people, processes, technology to maximize effectiveness.)
5. Термин "менеджмент" – это собирательное слово, означающее менеджеров организации.
   (The term "management" is a collective word describing the managers of an organization.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Management is the administration of an organization, whether it is a **b**…, a **n**…-**f**…-**p**… organization, or **g**… **b**… . Management implies **e**… **c**… : an enterprise **e**… implies human m… and implies some sort of successful **p**… or **s**… outcome. One habit of thought regards management as **e**… to "business **a**…" and thus excludes management in places outside commerce, as for example in **c**… and in the p… **s**… . **H**… this use of the term "management" often **c**… with the term "**l**…" – referring to those being managed.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is management? (administration of an organization, a business, a not-for-profit organization, a government body)
2. What does management include? (setting the strategy of an organization, coordinating the efforts of employees, to accomplish objectives, the application of available resources)
3. What kinds of resources require management? (financial, natural, technological, human resources)
4. Why does management imply effective communication? (human motivation, successful progress, system outcome.)
5. What are the main functions of management? (planning, organizing, commanding, coordinating, controlling)
6. Who defined the essence of management as a science? (Henri Fayol)

7. What do you know about the history of management? (the managers of an organization, the term contrasted with the term "labour")
8. How to define management on the whole? (the process of planning, organizing, coordinating, leading, controlling)

ЗАДАНИЕ 13. Расскажите об основных целях и задачах менеджмента по следующему плану, используя слова, данные в скобках.

1. The definition of management (the administration of an organization, the managers of an organization).
2. The core essence of management (setting the strategy of an organization, coordinating the efforts of employees, to accomplish objectives, the application of available resources).
4. Spheres of application of management (a business, a not-for-profit organization, a government body, the public sector, charities).
5. Main functions of management (planning (forecasting), organizing, commanding, coordinating, controlling).
6. The history of management (the term contrasted with the term "labour").
7. The main purpose of management (to "manage" work, people, processes, technology to maximize effectiveness).
8. Management on the whole (the process of planning, organizing, coordinating, leading, controlling).

Text 2
Five Functions of Management

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: engineer, director, theory, theoretician, function, component, personnel, problem, action, implementation, manner, instruction, activity, integrity, audit, initiative;
b) прилагательные: modern, relevant, creative, active, organized, regular, positive, corrective;
c) глаголы: focus on, coordinate, guarantee, optimize, communicate, base, motivate, harmonize.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Henri Fayol was a French **coal-mine engineer**, director of **mines** and modern management theoretician.
2. With respect to time and **implementation**, **planning** must be **linked to** and **coordinated** on different **levels**.

3. An **organization** can only **function** well if it is **well-organized**.
4. Successful **managers** have **integrity**, **communicate** clearly and **base** their decisions on **regular audits**.
5. The **final element** of management involves the comparison of the **activities of the personnel** to **the plan of action**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, определите основные функции менеджмента.

Образец: *Organizing is an important function of the five functions of management.*

1. Planning must take …	a) employees will know exactly what is required of them.
2. Organizing is …	b) stimulating motivation and discipline within the group dynamics.
3. When clear commanding, …	c) an important function of the five functions of management.
4. Coordinating therefore aims at …	d) the organization's available resources and flexibility of personnel into consideration as this will guarantee continuity.
5. Controlling includes …	e) information management, measurement of performance, and institution of corrective actions.

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **application**, n – применение, использование
2) **continuity**, n – непрерывность, преемственность, бесперебойность
3) **define**, v – дать определение
4) **achieve**, v – достигать, выполнять
5) **provide**, v – обеспечивать, обеспечить, снабжать
6) **complete**, v – завершить, выполнить
7) **assign**, v – назначать, отводить
8) **require**, v – требовать, предписывать, предполагать
9) **level**, n – уровень
10) **available**, adj. – доступный, имеющийся (в наличии)
11) **measurement**, n – измерение, оценка
12) **staff**, n – персонал, кадры
13) **increase**, v – увеличивать
14) **supply**, v – поставлять, снабжать
15) **expand**, v – расширяться, развиваться
16) **behaviour**, n – поведение, отношение, действие
17) **carry out**, v – осуществлять, выполнять
18) **conformity**, n - соответствие

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Five Functions of Management

Henri Fayol (1841–1925) was a French coal-mine engineer, director of mines and modern management theoretician. His scientific management theory forms the base for business administration and business management.

Henri Fayol defined five functions of management for the management component and these are still seen as relevant to organizations today. These five functions focus on the relationship between personnel and its management and they provide points of reference so that problems can be solved in a creative manner.

1. Planning

Planning is looking ahead. According to Henri Fayol, drawing up a good plan of action is the hardest of the five functions of management. This requires an active participation of the entire organization. With respect to time and implementation, planning must be linked to and coordinated on different levels. Planning must take the organization's available resources and flexibility of personnel into consideration as this will guarantee continuity.

2. Organizing

An organization can only function well if it is well-organized. This means that there must be sufficient capital, staff and raw materials so that the organization can run smoothly and that it can build a good working structure. The organizational structure with a good division of functions and tasks is of crucial importance. When the number of functions increases, the organization will expand both horizontally and vertically. This requires a different type of leadership. Organizing is an important function of the five functions of management.

3. Commanding

When given orders and clear working instructions, employees will know exactly what is required of them. Return from all employees will be optimized if they are given concrete instructions with respect to the activities that must be carried out by them. Successful managers have integrity, communicate clearly and base their decisions on regular audits. They are capable of motivating a team and encouraging employees to take initiative.

4. Coordinating

When all activities are harmonized, the organization will function better. Positive influencing of employees behaviour is important in this. Coordination therefore aims at stimulating motivation and discipline within the group dynamics. This requires clear communication and good leadership. Only through positive employee behaviour management can the intended objectives be achieved.

5. Controlling

The final element of management involves the comparison of the activities of the personnel to the plan of action, it is the evaluation component of management. By verifying whether everything is going according to plan, the organization knows

exactly whether the activities are carried out in conformity with the plan. Controlling includes information management, measurement of performance, and institution of corrective actions.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) составление плана действий	a) corrective actions
2) активное участие	b) measurement of performance
3) реализация, внедрение	c) evaluation component
4) имеющиеся (доступные) ресурсы	d) to have integrity
5) сырьевые ресурсы	e) employee
6) работник, служащий	f) to be of crucial importance
7) иметь решающее значение	g) raw materials
8) быть целостностным	h) available resources
9) оценочный аспект	i) implementation
10) измерение производительности	j) active participation
11) принятие корректирующих мер	k) drawing up a plan of action

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Planning is …	a) information management, measurement of performance and institution of corrective actions.
2. There must be …	b) the hardest of the five functions of management.
3. Return from all employees will be optimized if …	c) sufficient capital, staff and raw materials so that the organization can run smoothly.
4. Coordination therefore aims at …	d) they are given concrete instructions with respect to the activities that must be carried out.
5. Controlling includes …	e) stimulating motivation and discipline within the group dynamics.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. … respect to time and implementation, planning must be linked … and coordinated … different levels.
2. The organizational structure … a good division of functions and tasks is … crucial importance.
3. Successful managers have integrity, communicate clearly and base their decisions … regular audits.
4. Positive influencing … employees behaviour is important … coordination.
5. … verifying whether everything is going according … plan, the organization knows exactly … the activities are carried out … conformity … the plan.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Henri Fayol was a French coal-mine engineer, … and modern management theoretician.
   a) director of mines; b) supervisor of mines.
2. These five functions of management focus on … between personnel and its management.
   a) the relationship; b) creative manner.
3. Planning is looking … .
   a) back; b) ahead.
4. Coordination requires clear … and good … .
   a) communication/leadership; b) team/initiative.
5. The final element of management involves the … of the activities of the personnel to the plan of action.
   a) measurement; b) comparison.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Пять функций управления сосредоточены на отношениях между персоналом и его руководством.
   (Five functions of management focus on the relationship between personnel and its management.)
2. Планирование должно учитывать имеющиеся в организации ресурсы и гибкость персонала.
   (Planning must take the organization's available resources and flexibility of personnel into consideration.)
3. Организационная структура с хорошим разделением функций и задач имеет решающее значение.
   (The organizational structure with a good division of functions and tasks is of crucial importance.)
4. Эффективность работы всех сотрудников будет повышена, если им будут даны конкретные указания.
   (Return from all employees will be optimized if they are given concrete instructions.)
5. Согласование действий направлено на стимулирование мотивации и дисциплины.
   (Coordination aims at stimulating motivation and discipline.)
6. Контроль включает в себя управление информацией, измерение эффективности и организацию корректирующих действий.
   (Controlling includes information management, measurement of performance and institution of corrective actions.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

D… up a good plan of action requires an active participation of the **e**… organization. An organization can only **f**… well if it is well-**o**… . S… managers are capable of **m**… a team and encouraging employees to take **i**… . Only through positive **e**… **b**… management can the intended **o**… be achieved. Controlling is the evaluation **c**… of management.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Who was Henri Fayol (1841–1925) and what is he famous for? (a French coal-mine engineer, director of mines and modern management theoretician, the base theory for business administration and business management)
2. What do the main functions of management focus on? (the relationship between personnel and its management)
3. Why planning is the hardest of the five functions of management? (must take the organization's available resources and flexibility of personnel into consideration)
4. Why organizing is of crucial importance in management? (good division of functions and tasks)
5. How may return from all employees be optimized due to commanding function? (give concrete instructions, with respect to the carried out activities)
6. What is the main purpose of coordinating? (stimulating motivation and discipline)
7. What does controlling include? (information management, measurement of performance, institution of corrective actions)

ЗАДАНИЕ 13. Расскажите об основных функциях менеджмента по следующему плану, используя слова, данные в скобках.

1. Henri Fayol and his theory of management (a French coal-mine engineer, director of mines and modern management theoretician, the base theory for business administration and business management).
2. Five functions of management (focus on the relationship between personnel and its management; provide points of reference to solve problems in a creative manner).
3. Planning (must take the organization's available resources and flexibility of personnel into consideration, guarantee continuity).
4. Organizing (good division of functions and tasks, leadership requirement).
5. Commanding (return optimized from all employees, concrete instructions with respect to the activities).
6. Coordinating (stimulating motivation and discipline).
7. Controlling (information management, measurement of performance, institution of corrective actions).

Тексты для самостоятельной работы по теме «Management»

Text A

Прочитайте текст и выполните задание.

Types of Organizations

There are a variety of legal types of organizations, including corporations, governments, non-governmental organizations, political organizations, international organizations, armed forces, charities, not-for-profit corporations, partnerships, cooperatives, and educational institutions.

Formal organizations

An organization that is established as a means for achieving defined objectives has been referred to as a formal organization. Its design specifies how goals are subdivided and reflected in subdivisions of the organization. Divisions, departments, sections, positions, jobs, and tasks make up this work structure. Thus, the formal organization is expected to behave impersonally in regard to relationships with clients or with its members.

Informal organizations

In contrast to the appointed head or chief of an administrative unit, a leader emerges within the context of the informal organization that underlies the formal structure. The informal organization expresses the personal objectives and goals of the individual membership. Their objectives and goals may or may not coincide with those of the formal organization.

In prehistoric times, man was preoccupied with his personal security, maintenance, protection, and survival. Now man spends a major portion of his waking hours working for organizations. His need to identify with a community that provides security, protection, maintenance, and a feeling of belonging continues unchanged from prehistoric times. This need is met by the informal organization and its emergent, or unofficial, leaders.

Leaders emerge from within the structure of the informal organization. Their personal qualities, the demands of the situation, or a combination of these and other factors attract followers who accept their leadership within one or several overlay structures. Influence is the ability of a person to gain cooperation from others by means of persuasion or control over rewards. Power is a stronger form of influence because it reflects a person's ability to enforce action through the control of a means of punishment.

WRITING TASK

Напишите эссе на английском языке на тему «Types of Organizations: Formal and Informal Organizations».

Text B

Прочитайте текст и выполните задание.

Types of Business Entity

A company limited by guarantee

Commonly used where companies are formed for non-commercial purposes, such as clubs or charities. The members guarantee the payment of certain (usually nominal) amounts if the company goes into insolvent liquidation, but otherwise, they have no economic rights in relation to the company. A company limited by guarantee may be with or without having share capital.

A company limited by shares

The most common form of the company used for business ventures. Specifically, a limited company is a company in which the liability of each shareholder is limited to the amount individually invested with corporations being the most common example of a limited company. A company limited by shares may be a publicly traded company or a privately held company.

A company limited by guarantee with a share capital

A hybrid entity, usually used where the company is formed for non-commercial purposes, but the activities of the company are partly funded by investors who expect a return.

A limited liability company

A company – statutorily authorized in certain states – that is characterized by limited liability, management by members or managers, and limitations on ownership transfer, i.e., L.L.C. LLC structure has been called "hybrid" in that it combines the characteristics of a corporation and of a partnership or sole proprietorship. Like a corporation, it has limited liability for members of the company, and like a partnership it has "flow-through taxation to the members" and must be "dissolved upon the death or bankruptcy of a member".

An unlimited company with or without a share capital

A hybrid entity, a company where the liability of members or shareholders for the debts (if any) of the company are not limited.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Main Types of Business Entity and Less Common Types of Companies».

Unit 4
Public Relations and Advertising

Text 1
Advertising and Public Relations

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: public, organization, product, communication, channel, professionals, media, role, image, company, client, crises, program, encyclopedia, individual, corporation, institution, campaign, revolution, masses;
b) прилагательные: philanthropic, traditional, industrial;
c) глаголы: address, plan.

ЗАДАНИЕ 2. Догадайтесь о значении выделенных слов в предложении.

1. An attractive appearance makes a **favorable** impression at the first meeting.
2. His ideas are still **relevant** today.
3. **Persuasion** is the best way to get children to do something**.**
4. My father keeps the **tools** in the garage.
5. Sometimes people act as **individuals** but at other times they act as a group.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, скажите, какие задачи решают специалисты по связям с общественностью.

Образец: *PR professionals <u>manage crises that threaten company image</u>*.

1. PR practitioners …	a) manage crises that threaten company image. b) cultivate favorable relations for organizations with their key publics. c) establish and maintain goodwill and understanding between an organization and its publics.
2. PR professionals …	d) closely monitor numerous media channels. e) work with members of the news media. f) build awareness and a favorable image for a company or client. g) build goodwill among an organization's target market.

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **cultivation, n –** зд. создание
2) **keypublics –** основная аудитория; люди, которые связаны с организацией
3) **publicize, v –** рекламировать, делать известным
4) **inprint and broadcast media –** в печатных и вещательных СМИ
5) **public comment –** комментарии общественности
6) **goodwill, n –** благожелательное расположение (общественности, клиентуры)
7) **target market –** зд. целевая аудитория, клиентура
8) **event, n –** мероприятие
9) **general public –** широкая общественность
10) **to win favour –** завоевать расположение, благосклонность
11) **accurate, a –** правильный, корректный
12) **sustained effort –** последовательные усилия

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Advertising and Public Relations

Public relations involve the cultivation of favorable relations for organizations and products with their key publics through the use of a variety of communication channels and tools. Traditionally, this meant public relations professionals would work with members of the news media to build a favorable image by publicizing the organization or product through stories in print and broadcast media. But today the role of public relations is much broader and includes:

1) building awareness and a favourable image for a company or client within stories and articles found in relevant media outlets;

2) closely monitoring numerous media channels for public comment about a company and its products;

3) managing crises that threaten company or product image;

4) building goodwill among an organization's target market through community, philanthropic and special programs and events.

The World Book Encyclopedia defines public relations, or PR, as "an activity aimed at increasing communication and understanding between an organization or individual and one or more groups called publics". The ultimate goal of any public relations effort is for a corporation, institution, organization or individual to win favor with the general public. In order to do this, the public's interests and concerns must be addressed. Good communication is the foundation of any successful public relations campaign.

Persuasion and information distribution have been around, in one form or another, since the beginning of time. However, public relations as an industry or practice has only been around since the early 1900s. With the dawn of the Industrial Revolution, young corporations discovered that their growth depended on gaining the goodwill of the masses.

Public Relations is the planned and sustained effort to establish and maintain goodwill and understanding between an organization and its publics.

Many think that PR is just about promoting an organization, whereas most PR work involves ensuring publics have an accurate view of the organization, even if they don't like what it does.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) связи с общественностью	a) favorable image
2) благоприятные отношения	b) closely monitoring
3) специалисты по связям с общественностью	c) public comment
4) положительный образ	d) public relations professionals
5) посредством рекламы	e) managing crises
6) тщательно отслеживать	f) public relations
7) комментарии общественности	g) philanthropic
8) расширение связей	h) favorable relations
9) преодоление кризиса	i) by publicizing
10) благотворительные	j) increasing communication

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. PR aims at the creation of favorable relations for …	a) within various stories and articles found in relevant media outlets.
2. PR professionals build a favorable image for a company …	b) of a correct opinion about the organization.
3. One of the important PR professionals' tasks is …	c) to the early 1900s.
4. PR practice dates back …	d) the organization with its key publics.
5. Most PR work involves ensuring publics are …	e) to manage crises that threaten company image.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. PR cultivates favorable relations … organizations and products.
2. PR professionals work … members of the news media.
3. Good communication is the foundation … any successful PR campaign.

4. PR maintains understanding … an organization and its publics.
5. PR monitors media channels for public comment … a company and its products.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите предложения.

1. The cultivation of favourable relations for organizations with their key publics is realized through the use of …
   a) a variety of corporations and institutions; b) a variety of communications channels and tools.
2. Today the role of PR is much broader and includes …
   a) managing relevant media outlets; b) managing crises that threaten product image.
3. In order to win favor with the general public …
   a) the public's interests and concerns must be addressed; b) a company needs to comment about its products.
4. The foundation of any successful public relations campaign is…
   a) good communication; b) special programs and events.
5. PR aims at …
   a) promoting an organization; b) ensuring publics have an accurate view of the organization.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Целью связей с общественностью является способствовать завоеванию организацией благожелательного отношения со стороны широкой общественности.
   (The goal of any public relations effort is for an organization to win favour with the general public.)
2. Роль связей с общественностью предполагает управление кризисами.
   (The role of public relations includes managing crises that threaten company image).
3. Убеждение и распространение информации использовались с незапамятных времен.
   (Persuasion and information distribution have been around, in one form or another, since the beginning of time.)
4. Связи с общественностью – это последовательные усилия по достижению взаимопонимания между организацией и людьми с ней связанными
   (PR is the planned and sustained effort to establish understanding between an organization and its publics.)
5. Рост корпораций зависел от благожелательного отношения масс.
   (The growth of corporations depended on gaining the goodwill of the masses.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

PR is an activity aimed at increasing **c**… and **u**… between an organization or individual and its **p**… . The role of PR includes: building company's **f**… image, monitoring **m**… channels, **m**… crises, building **g**… among an organization's **t**… market. PR work involves ensuring publics have an **a**… view of the **o**… .

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. How does the World Book Encyclopedia define PR? (the World Book Encyclopedia; an activity; increasing communication and understanding; between an organization and publics)
2. What does the role of PR include? (the role of PR; building awareness and a favorable; monitoring media channels; managing crises)
3. What is the ultimate goal of any PR effort? (the ultimate goal; organization or individual; to win favour; the general public)
4. Is good communication the foundation of any successful public relations campaign? (good communication; the foundation; successful; PR campaign)
5. Which PR methods have been used since the beginning of time? (persuasion and information distribution; since the beginning of time)
6. When did PR practice start? (PR; has only been around since the early 1900s)
7. What does most PR work involve? (most PR work; ensuring publics; an accurate view of the organization)

ЗАДАНИЕ 13. Расскажите о роли связей с общественностью в современном мире по следующему плану, используя слова, данные в скобках.

1. PR cultivates favorable relations for organizations with their key publics (cultivation, favourable relations, organizations, products, key publics, variety, communication channels, tools).
2. At present the role of PR is much broader than it used to be (today, role, broader, building, favorable image, company, media outlets, monitoring, media channels, managing crises, goodwill, organization's target market, community, philanthropic, special programs, events).
3. The ultimate goal of PR (ultimate goal, to win favor, organization, with the general public, interests, concerns, be addressed, communication, foundation, successful, PR campaign).
4. PR practice dates back to the early 1900s (PR industry, PR practice, the early 1900s, the dawn, the Industrial Revolution, young corporations, growth, goodwill, masses).
5. Publics' accurate view of the organization is the most important for PR (PR work, ensuring, publics, accurate, view of the organization).

Text 2
Related Sciences
(Advertising, Marketing and Journalism)

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: marketing, practice, management, process, reputation, sponsor, radio, content, journalist, contrast;
b) прилагательные: central, complex, commercial, specific;
c) глаголы: communicate, control.

ЗАДАНИЕ 2. Догадайтесь о значении выделенных слов в предложении.

1. People always **confuse** John with his brother.
2. Heavy snowfalls are not **anticipated** this week.
3. It is necessary to make a **distinction** between good and bad.
4. Parents **persuade** children into eating vegetables.
5. He is a specialist in the **field** of biology.

ЗАДАНИЕ 3. Используя образец и слова, данные справа, скажите, на опыт каких наук опираются связи с общественностью.
Образец: *PR draws expertise on <u>marketing</u>.*

1. PR draws expertise on …	a) marketing b) advertising
2. PR is connected with …	c) journalism

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **marketing mix –** маркетинг микс или комплекс маркетинга
2) **consumer, n –** потребитель, клиент
3) **profit, n –** прибыль
4) **identify, v –** выявлять
5) **quantify, v –** количественно оценить, измерить
6) **communicate, v –** сообщать
7) **raise complaints –** подавать жалобы
8) **show promise – зд.** переориентируется
9) **sales-oriented –** ориентированный, нацеленный на продажи
10) **medium, n –** агент, посредник
11) **airtime –** эфирное время
12) **column inches –** место для рекламы в газете

13) **promotional message –** рекламное сообщение
14) **editorial pages –** рекламная полоса
15) **newsworthiness, n –** информационная ценность
16) **underlying, a –** основной
17) **more critical –** зд. более явные
18) **detrimental, a –** вредный, пагубный
19) **practitioner, n –** специалист

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Related sciences
(Advertising, Marketing and Journalism)

Marketing is the field most commonly confused with PR – not unreasonably since it refers to PR in its texts and practice as part of the marketing mix. The Institute of Marketing defines marketing as: 'The management process responsible for identifying, anticipating and satisfying consumer requirements profitably'.The two central words here are 'consumer' and 'profit'. Marketing campaigns are often preceded and followed by research to measure the degree to which an attitude or behavior has changed after the marketing activity. Have more people heard of the product now? Have they bought (or used) it, or are they more likely to?

However, public relations campaigns are often harder to quantify. Many organizations do not have goods or services to sell. However, they do all have messages to communicate and – importantly – to receive. They need to maintain relationships with all those who may work for them, give time or money, raise complaints, or vote for or against them. These relationships are too complex to be covered by marketing. This is why commercial companies, who do have things to sell, also have public relations departments.

Advertising which had previously been used almost exclusively by marketers trying to sell specific products began to show promise for broader, less sales-oriented messages. Some of the first were so-called image ads that tried to polish or "sell" the reputation of ad's sponsor.

The distinction between advertising and PR is more easily made: advertising involves paying a medium (TV, radio, newspaper or magazine, for example) for airtime or column inches in which to put across a promotional message. The content of an ad is always controlled by the advertiser, unlike the content of editorial pages, which are controlled by journalists. Public relations practitioners try to persuade journalists to cover their products and services on the grounds of newsworthiness.

The underlying differences between public relations and journalism are far more basic and far more critical.

Journalism serves the general public, and journalists are expected to act in the public's best interests even if such actions have detrimental effects on their employers.

Public relations, in contrast, serve the specific organization or client who is paying the practitioner to build and manage relationships that help that organization/client achieve its goals.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) предвидение	a) vote for or against
2) сложнее поддаются количественной оценке	b) have detrimental effects
3) товары и услуги	c) the content of an ad
4) голосуют за или против	d) public relations practitioners
5) отделы по связям с общественностью	e) on the grounds of newsworthiness
6) содержание рекламы	f) harder to quantify
7) посредник	g) anticipating
8) на основе информационной ценности	h) a medium
9) имеют вредные последствия	i) public relations departments
10) специалисты по связям с общественностью	j) goods and services

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Marketing refers to PR …	a) by the advertiser.
2. Organizations need to maintain relationships …	b) as part of the marketing mix.
3. The content of an ad is always controlled …	c) on the grounds of newsworthiness.
4. PR practitioners try to persuade journalists to cover their products …	d) to build and manage important relationships.
5. The client pays the PR practitioner …	e) with their public.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The Institute of Marketing defines marketing … the management process.
2. PR campaigns are harder … quantify.
3. Advertising had previously been used almost exclusively … marketers.
4. Journalists are expected to act … the public's best interests.
5. The differences … PR and journalism are far more critical.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите предложения.

1. The two central words associated with management are …
   a) ‘consumer’ and ‘profit’; b) ‘goods’ and ‘services’.
2. Editorial pages are controlled …
   a) by advertisers; b) by journalists.
3. Public relations serves …
   a) the general public; b) the specific organization or client.
4. Public relations campaigns are often harder to quantify because many organizations …
   a) do not have goods or services to sell; b) have messages to communicate and to receive.
5. PR is part of…
   a) editorial pages; b) the marketing mix.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. В задачи менеджмента входит выявлять, предвидеть и удовлетворять потребности клиентов.
   (The management process is responsible for identifying, anticipating and satisfying consumer requirements).
2. Многим организациям необходимо сообщать и получать информацию.
   (Many organizations have messages to communicate and to receive.)
3. Реклама предполагает оплату услуг посредника.
   (Advertising involves paying a medium (TV, radio, newspaper or magazine) for airtime or column inches).
4. Журналисты действуют в интересах общественности.
   (Journalists are expected to act in the public's best interests).
5. Связи с общественностью служат интересам определенной организации или клиента.
   (Public relations serves the interests of the specific organization or client.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

M… is often confused with PR. However, PR campaigns are often harder to **q**… . The distinction between **a**… and PR is more easily made. Advertising involves paying a **m**… for airtime or column inches in which to put across a **p**… message. **J**… serves general **p**… while PR **s**… the specific **o**… or client.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. Which field is most commonly confused with PR? (marketing; the field; confused with PR)

2. What is the main difference between marketing and PR? (the two central words are ‘consumer’ and ‘profit’; PR campaigns are often harder to quantify)
3. Why do commercial companies, who do have things to sell, also have public relations departments? (commercial companies; maintain relationships; work for them; give time or money; raise complaints; vote for or against)
4. Is the distinction between advertising and PR easily made? (the distinction between advertising and PR; more easily made; paying a for airtime or column inches; to put across a promotional message)
5. Who does journalism serve? (journalism; the general public; in the public's best interests)
6. Who does PR serve? (PR; serves; the specific organization or client)
7. How do PR practitioners persuade journalists to cover their products and services? (PR practitioners; to cover their products and services; on the grounds of newsworthiness)

ЗАДАНИЕ 13. Расскажите об отличиях связей с общественностью от маркетинга, рекламы и журналистики по следующему плану, используя слова, данные в скобках.

1. The definition of marketing by the Institute of Marketing (the management process; identifying; anticipating; satisfying; consumer requirements profitably).
2. The difference between PR and marketing (The two central words; ‘consumer’ and ‘profit’; public relations campaigns are often harder to quantify; too complex to be covered by marketing).
3. The difference between PR and advertising (the distinction; paying a medium; airtime or column inches, to put across a promotional message, the content; controlled by the advertiser; to cover products and services on the grounds of newsworthiness).
4. The difference between PR and journalism (journalism; the general public; PR; the specific organization; client; build and manage relationships; organization/client; achieve its goals).

Тексты для самостоятельной работы по теме «Public Relations and Advertising»

Text A

Прочитайте текст и выполните задание.

PR Tools

The traditional key tools available for PR include: media relations, media tours, newsletters, special events, speaking engagements, sponsorships, employee relations, community relations and philanthropy. Let us have a look at the most widespread ones.

Speeches

When done well, few things can convey your message like a well-delivered speech. The speech must be concise, entertaining and well articulated. Politicians and corporate heads are constantly called upon to speak publicly. Because of this, they often hire speechwriters, people who know how to craft a message effectively to pull emotional strings. Small business owners may be asked to speak at a college or high school function, before a group or club, or at any number of events. But don't just sit around and wait to be invited. Take the proactive route and volunteer to speak!

Public Appearances

Placing a representative from your company at various events can yield numerous benefits to your business. It is a way of taking part in the community, showing your interest and opening up the lines of communication. There are many places and events at which to make appearances: charity galas and fundraisers, community symposia, chamber of commerce conventions and mixers, and many others - the calendar is full of them. It is just a matter of having someone present to show that your company is concerned with what is going on in the region.

Press Conferences

Holding a press conference is usually only necessary to make a major announcement. A representative or two from your company speaks, making the announcement and elucidating upon it, and the conference is open to question and discussion with the members of the media. The speaker should be thoroughly prepared for all possible questions. In general, the speaker should be someone who is well spoken, charming and able to address negative matters in a positive fashion. As a general rule, never hold a press conference if a press release or a few telephone calls will serve your purpose.

Presentations

A presentation is akin to a press conference. Depending on your line of business, you may be asked to speak in front of a group of your peers, clients, or to a club. The goal is to be general, informative, anecdotal, and use as many attention-catching devices as possible. Maybe you have a company video or film you can screen, or possibly some of the company's ads. The presentation is basically a broader form of the press conference, which is usually focused on one event or announcement.

Until recently most public relations activity involved person-to-person contact between PR professionals and members of the media, such as journalists and television news reporters. However, several trends are developing that alter the tasks performed by PR people. In most cases these changes are the result of new Internet technologies that are quickly gaining widespread acceptance among Internet users and are becoming new media outlets in their own right (Blogs; Discussion Forums**;** RSS Feeds; Podcasting; Search Engine Optimization).

WRITING TASK

Напишите эссе на английском языке на тему “PR Tools that are Most Often Used in Russia”

Text B

Прочитайте текст и выполните задание.

PR Models

As public relations developed over the past 100-plus years, it has evolved to meet the changing needs of clients and to reflect changes in society. J. E. Grunig and T. Hunt have articulated four models that represent the practice of contemporary American public relations, and which depict its evolution.

Press Agentry Model

The earliest PR model to appear was press agentry or publicity and was characterized as one-way, source-to-receiver communication. Its purpose was largely propagandistic and the truth was sometimes expendable. Press agents did little research aside from monitoring the media in which they sought to place favorable articles about their clients. Publicity continues to be a component of contemporary American PR and is used in sports, entertainment and product publicity, although today's practitioners are less likely to take liberties with the truth.

Public Information Model

The purpose of this model is dissemination of information, and it is predicated on the idea that if the public has sufficient information and that information is truthful, then the public will believe and behave in ways that are helpful to the client. PR practitioners operating in this model conduct some research, but it is generally limited to readability analyses and readership studies. Today, the public information model can be found in government agencies, NGOs (non-governmental organizations) and in some businesses.

Two-Way Asymmetric Model

The two-way asymmetric model relies on two-way communication: from source to receiver and back to source. The model means that the client is seeking to change the beliefs or behavior of the target public, but is not willing to change its own beliefs or behaviors. Unlike its predecessor models, the two-way asymmetric model of PR relies heavily on research about the target publics. Such research is frequently conducted through attitude surveys and focus groups. This model is practiced extensively today by many businesses and public relations agencies.

Two-Way Symmetric Model

This model argued that the over-riding purpose of public relations was not persuasion, as suggested by earlier models. Instead, it posited the notion of creating mutual understanding and accommodation between organizations and their publics as the goal of public relations. The communication in this model is two-way, and the effects are balanced. This model places greater emphasis on the use of dialogue and negotiation between organizations and their publics. It also requires far more research to understand the issues that are creating contention and the publics that are affected by these issues. Today, many PR practitioners consider this model to be "emergent" and yet fully developed.

Nowadays we can find other views on public relations and some practitioners are adept at moving from one model to another, others limit their practice to a specific model.

WRITING TASK

Подготовьте презентацию на английском языке на тему «PR Model(s) that are used in Modern PR Practice».

PART VII
COMPUTING TECHNOLOGIES

Information technology system is an information system, a communications system or a computer system – including all hardware, software and peripheral equipment. Computing is the process of using computer technology to complete a given goal-oriented task. It may encompass the design and development of software and hardware systems for a broad range of purposes to help in scientific studies, making intelligent systems and creating and using different media for entertainment and communication.

One of the chief applications of computing nowadays is robotics. Robotics deals with the design, construction, operation, and use of robots, as well as computer systems for their control, sensory feedback, and information processing.

1. What does information technology system include?
2. What is computing?
3. Where is chief computer application today?

Unit 1
Digital Technologies

Text 1
What is Computer?

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на часть речи*:*

a) существительные: machine*,* control, instruction, result, battery, navigation, document, function, profession;
b) прилагательные: electronic, mechanical, arithmetic, binary, physical, logical;
c) глаголы: design, represents.

ЗАДАНИЕ 2. Прочитайте предложения и догадайтесь о значении выделенных слов.

1. If you can use the computer at any place that you like it is **portable**.
2. A **desktop** computer refers to usual personal computer used in a single location.
3. **Servers** communicate with client computers, store, retrieve or communicate data in a network.
4. **Local** area network usually covers relatively small area within school, business of any community.
5. To set your desktop use the **tool** box in the menu.

ЗАДАНИЕ 3. Используя образец и выражения, данные права, скажите, что можно делать при помощи компьютера.

Образец: *Computer can help you <u>draw.</u>*

1. Computer can help you …	a) search for information b) communicate with friends c) make computations and measurements
2. With the help of the computer you can …	d) play games e) draw f) watch films g) read books and listen to music h) study new things

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **to design** – возникнуть, разработать
2) **term** – термин
3) **to calculate** – вычислять
4) **to call** – называть
5) **analytical engine** – аналитическая машина
6) **punch card** – перфокарта
7) **raw data** – необработанные данные
8) **computer case** – корпус компьютера
9) **keyboard** – клавиатура
10) **handheld** – портативный, переносной
11) **touch-sensitive** – сенсорный
12) **to type** – набирать текст
13) **tablet** – планшетный компьютер
14) **hardware** – аппаратная часть
15) **software** – программное обеспечение
16) **word processo**r – программа текстового редактора
17) **medium** – среда
18) **to process** – обрабатывать

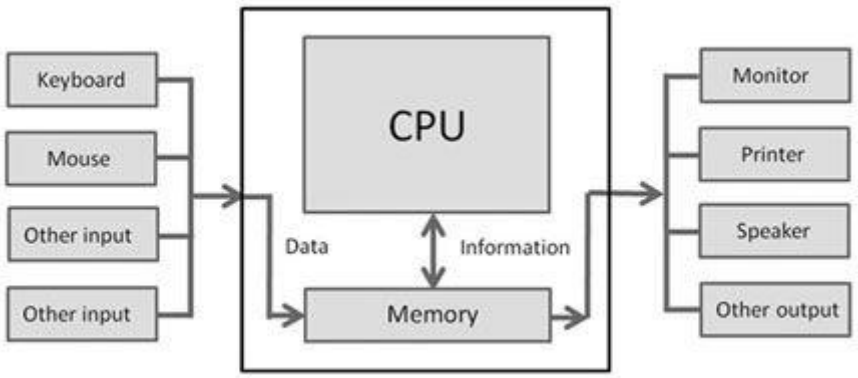
ЗАДАНИЕ 5. Прочитайте и переведите текст

What is Computer?

Computer is an electronic device that is designed to work with information. The term **computer** is derived from the Latin term ‘computare’, this means “to calculate” or “programmable machine”. The word 'computer' usually refers to the Center Processor Unit plus Internal memory.

Charles Babbage is called the "Grand Father" of the computer. The first mechanical computer designed by Charles Babbage was called analytical engine. It uses read-only memory in the form of punch cards.

Computer is an advanced electronic device that takes raw data as input from the user and processes these data under the control of set of instructions (called program) and gives the result (output) and saves output for the future use. It can process both numerical and non-numerical (arithmetic and logical) calculations. Program represents the decimal numbers through a string of binary digits.



There are different types of computers. Many people use desktop computers at work, home, and school. Desktop computers are designed to be placed on a desk, and they're typically made up of a few different parts, including the computer case, monitor, keyboard, and mouse.

Laptop computer, commonly called a laptop are battery-powered computers that are more portable than desktops, allowing you to use them almost anywhere. Tablet computer - or tablet - are handheld computers that are even more portable than laptops. Instead of a keyboard and mouse, tablets use a touch-sensitive screen for typing and navigation. The iPad is an example of a tablet.

A server is a computer that serves up information to other computers on a network. For example, whenever you use the Internet, you're looking at something that's stored on a server. Many businesses also use local file servers to store and share files internally.

All computers have two common elements: hardware and software. Hardware is any part of your computer that has a physical structure, such as the keyboard or mouse. It also includes all of the computer's internal parts. Software is any set of instructions that tells the hardware what to do and how to do it. Examples of software include web browsers, games, and word processors.

A computer has the ability to store, retrieve and process data. You may already know that you can use a computer to type documents, send email, play games, and browse the Web.

Computers can provide a wide range of functions which make computers useful for everyday situations. They can be useful for work or recreation and make interesting experimental mediums. Having access to the Internet can offer numerous and unlimited possibilities for research. Several people use computers in an office to process their work assignments. Others own their own business and keep track of sales, make their orders online and do other business related actions with their computers. Computers are very easy to network together and are very useful in office settings. Networking allows for easy transfer of files and work related information between computers and allows the network to access shared files. Computers are excellent design tools which can be used in a number of professions.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

электронное устройство, термин, вычислять, внешняя память, перфокарта, необработанные данные, цифровые вычисления, десятичное число, цепь (последовательность), настольный компьютер, компьютер, работающий на батарее, планшет, делиться, хранить информацию, интересная экспериментальна среда, неограниченные возможности.

ЗАДАНИЕ 7. Преобразуйте слово, данное в скобках, в нужную часть речи, используя требующийся суффикс.

1. Tablets use a touch-sensitive screen for … (type) and … (navigate).
2. Computers processes data under the control of set of … (instruct).
3. With computers it is easier to keep track of sales, make orders online and do other business … (relate) actions.
4. Desktops are … (typical) made up of a few different parts.
5. A wide range of functions make computers … (use) foreverydaysituations.

ЗАДАНИЕ 8. Соедините части предложений по смыслу.

1. The term computer is …	a) through a string of binary digits.
2. The first mechanical computer …	b) derived from the Latin term ‘computare’ (to calculate).
3. Program represents the decimal numbers …	c) serves up information to other computers on a network.
4. A server …	d) you can type documents, send email, play games.
5. With the help of computer …	e) was called analytical engine.

ЗАДАНИЕ 9. Вставьте необходимые предлоги.

1. The word 'computer' usually refers … the Center Processor Unit plus Internal memory.
2. Analytical engine uses read-only memory … the form of punch cards.
3. Computers save output … the future use.
4. Many people use desktop computers … work, home, and school.
5. Instead … a keyboard and mouse, tablets use a touch-sensitive screen for typing and navigation.

ЗАДАНИЕ 10. Выбрав правильный вариант, закончите следующие предложения.

1. The first mechanical computer designed by Charles Babbage was called … .
   a) analytical engine; b) punched card; c) internal memory.
2. Program represents the … through a string of binary digits.
   a) processing; b) files; c) decimal numbers.
3. … computers are typically made up of a few different parts.
   a) Tablet; b) Desktop; c) Notebooks.
4. Instead of a keyboard and mouse, tablets use a … .
   a) camera; b) touch-sensitive screen; c) barcode.
5. Whenever you use the Internet, you're looking at something that's stored on a … .
   a) cloud computing; b) server; c) CPU.

ЗАДАНИЕ 11. Опровергните или подтвердите словами из текста, что:

1. Возможности компьютера незаменимы в повседневной жизни.
2. Аппаратная часть – это набор инструкций.
3. При помощи сети легко можно получить доступ к общим файлам.
4. Ноутбуки более портативные, чем планшетные компьютеры.
5. На компьютере выполняют цифровые, арифметические и логические вычисления.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. How did the word computer appear? (the Latin term ‘computare’)
2. What is computer? (electronic device; work with information)
3. Who created the first computer? (Charles Babbage) How was it called? (analytical engine)
4. What is a program? (set of instructions)
5. What are the basic types of computer? (desktop computers; laptop; server; tablets)

6. What are the basic parts of a desktop? (the computer case; monitor; keyboard; mouse)
7. What are the main abilities of computer? (hardware; software)
8. What possibilities do computers offer? (work; recreation; research; do business related actions, etc.)

ЗАДАНИЕ 13. Перескажите приведенный ниже текст об устройстве компьютера, переведя информацию в кавычках на английский язык.

Computer is (электронное устройство для переработки информации). It usually refers to the (центральное обрабатывающее устройство и внешняя память). The first mechanical computer (созданный Чарльзом Беббиджем) was called (аналитическая машина) and it used (перфокарты).

Computer (получает необработанные данные) from the user and (обрабатывает эти данные). Then, it (выдает результаты) and saves output (для дальнейшего использования). Program represents (представляет собой набор инструкций).

There are (разные типы компьютеров). Many people use (настольные компьютеры, ноутбуки и планшеты). Laptops (состоят из корпуса, монитора, клавиатуры и мыши). Ноутбуки и планшеты – переносные computers. (У планшетов есть сенсорный экран) for typing and navigation.

A server (хранит информацию) to other computers on a network. With the help of a server (предприятия обмениваются нужными файлами).

All computers have (аппаратная часть и программное обеспечение). (Аппаратная часть) has a physical structure and includes computer's internal parts. (Программное обеспечение это) set of instructions that tells the hardware what to do.

A computer has the ability to (хранить, находить и обрабатывать данные). Computers (имеют широкий спектр функций). Access to the Internet (предлагает неограниченные возможности). Computers are (замечательный инструмент) which can be used in a number of professions.

ЗАДАНИЕ 14. Расскажите об устройстве компьютера по следующему плану, используя слова, данные в скобках.

1. What is a computer (advanced electronic device, work with information).
2. The principle of computer`s work (takes raw data, input, processes, output).
3. Types of computers (Desktop, Laptop, tablet, server).
4. Portable computers (battery-powered, a touch-sensitive screen).
5. Common elements of computer (hardware, software).
6. The computer use for work (to store, retrieve, process data, type documents, send email, and browse the Web, etc.).

Text 2
Input, Output and Storage Devices

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значение, обращая внимание на часть речи:

a) существительные: block, device, code, theory, virus, monitor;
b) прилагательные: graphic, visual, magnetic. basic;
c) глаголы: decode, result, collect.

ЗАДАНИЕ 2. Прочитайте предложения и догадайтесь о значении выделенных слов.

1. Data can be collected and entered into a computer for **processing**.
2. **Hardcopy** is a printed copy of a document.
3. **Speakers** or headphones are useful for listening music and not to disturb other people.
4. With cloud storage you use the information by **uploading** files to it across the Internet.
5. The **primary** responsibility of a computer processor is to execute a program.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, опишите устройства ввода/вывода.

Образец: *Input devices <u>are necessary for work with a PC.</u>*

1. Input devices …	a) take data into computer b) take data out of computer c) are keyboard, a graphics tablet and a mouse
2. Output devices …	d) are printer, monitor, projector e) are important part of computer system

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **input devices** – устройства ввода
2) **output devices** – устройства вывода
3) **storage devices** – устройства хранения
4) **Central Processing Unit** – процессор
5) **magnetic stripe reader** – устройство считывания магнитных полос
6) **handy** – удобный

7) **circumstances** – условия
8) **immediately** – сразу
9) **to switch of/on** – выключать/включать
10) **non-volatile** – энергонезависимый
11) **to back up** – сохранять
12) **responsibility** – зд. обязанность
13) **to fetch** – захватывать данные
14) **to decode** – декодировать данные
15) **to execute**– выполнять
16) **to writeback**– выполнять обратную запись, сохранять.

ЗАДАНИЕ 5. Прочитайте и переведите текст

Input, Output and Storage Devices

All computers have the same four basic building blocks. These are the input devices, output devices, storage devices and the brain of the computer, the Central Processing Unit (CPU).

Input devices take data from the 'outside world' (i.e. outside of the computer) and send it to the Central Processing Unit for processing. Data can be collected and entered into a computer in a range of ways. These include, for example, a keyboard, a mouse, a graphics tablet, a touch screen, a bar code reader, a magnetic stripe reader and so on.

Every computer system will need to have a way of displaying information or printing information out so that it is useful to humans. There needs to be, therefore, some 'output devices'. A very useful output device is a VDU (or Visual Display Unit). Another handy one that allows you to produce 'hardcopy' (i.e. a printout on paper) is a printer. It is possible that you also need an audio output. Speakers or headphones would be useful in these circumstances!

Of course, the computer might not want to display or print out the results of some processing immediately. It might simply want to store the results for another time. It therefore needs some storage devices. Storage devices will store data, even when the power to the computer is switched off. When the power is switched on again, the data can be retrieved. For this reason, storage devices are known as 'non-volatile' devices. Examples include USB pen drives, hard disks, CDs, CD R/Ws, DVDs, SD and micro SD cards, Blu-ray disks and magnetic tape. The hard drive is a very important storage device in your computer. It holds all of your files, even when the power is switched off, it also holds your operating system and all of the programs you want to use.

Another increasingly important 'storage device' is cloud storage. This is where you store data on someone else's computer system by uploading files to it across the Internet. This means that you don't have to use your own storage space and your files in theory should be backed up by the cloud company and safe from viruses. As long

as you have an Internet connection, you can get your files back at any time from any computer.

Once data has been read into the computer via the input devices, it is processed by the CPU. The CPU then outputs the data using output devices, perhaps to a monitor or speakers, or saves it for later using a storage device. The primary responsibility of a computer processor is to execute a sequential set of instructions that constitute a program. CPU operation can be divided into four basic steps, namely, fetch, decode, execute and writeback. During the 'fetch' step, the processor retrieves program instructions from memory. In the decode step, the instruction is broken down into parts. The instruction set architecture of the CPU defines the way in which an instruction is decoded. In the 'execute' step, CPU performs the operation implied by the program instruction. During the 'writeback' step, the CPU writes back the results of execution, to the computer's memory.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний:

базовые компоненты, обработка, вводить в компьютер, графический планшет, считыватель штрих-кода, изображение информации, выведение на печать, флеш-накопитель, облачное хранилище, безопасный, последовательный перечень инструкций, память, разделять на части, выполнять действия.

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Input devices …	a) holds all of your files, your operating system and programs.
2. Output devices …	b) from storage devices.
3. The data can be retrieved …	c) display or print out the information.
4. Hard drive …	d) is to execute a sequential set of instructions.
5. The primary responsibility of a computer processor …	e) send data to the CPU for processing.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. The data is processed … the CPU.
2. CPU operation can be divided … four basic steps.
3. The processor retrieves program instructions … memory.
4. The hard drive is a very important storage device … your computer.
5. The computer might store the results of the processing … another time.
6. Thee processed data is useful … humans.
7. You can store data … someone else's computer system by uploading files to it across the Internet.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Data enters computer and is processed by … .
   a) storage devices; b) CPU; c) output devices.
2. … are devices for audio output.
   a) Information or data; b) Speakers or headphone; c) Printer or scanner.
3. When the power is switched … again, the data can be retrieved from the computer. a) off; b) at; c) on.
4. ... helps you to economize storage space.
   a) Blue ray discs; b) Internet access; c) Cloud storage.
5. During the "…" step, the processor retrieves program instructions from memory.
   a) writeback; b) fetch; c) decode

ЗАДАНИЕ 10. Опровергните или подтвердите словами из текста, что:

1. Компьютеры имеют три основных элемента системы.
2. Существуют разные способы ввода информации в компьютер.
3. Устройства хранения содержат данные, которые хранятся и при выключенном компьютере.
4. Ты можешь получить доступ к облачному хранилищу при условии, что Интернет подключен.
5. На шаге «декодирования» процессор записывает результаты обработки в память.

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

All computers have input devices, **o**… devices and **s** … devices. **I**… devices enter **d**… into computer. **U**… output processed **d**… out of computer. **S**… devises store **d**… even when computer is switched off. By **c**… computing you store your **d**… by uploading files across the Internet. CPU **p**… the input data. A set of instruction constitute a **p**… CPU operations are: **f**…, **d**…, **e**…, **w**….. . The results of processing return to the **m** … of computer.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is the function of input devices? (take data; 'outside world')
2. What to output devices do? (way of displaying/printing information)
3. What is special in the work of storage devices? (store the results for another time)
4. How can cloud computing be useful? (don't have to use your own storage space)

5. Who is responsible for safety of your files in cloud storage? (the cloud company)
6. What is the basic responsibility of the CPU? (date; process)
7. What are the basic CPU operations? (fetch; decode; execute; writeback).

ЗАДАНИЕ 13. Расскажите об устройствах ввода, вывода и хранения по следующему плану, используя слова, данные в скобках.

1. The basic parts of a computer (input, output, storage devices, CPU).
2. Input devices (outside word, collected, touch screen, barcode reader, magnetic stripe).
3. Output devices (print out, hardcopy, handy, audio output).
4. Storage devices (results of processing, power off, power on, non-volatile).
5. Cloud storage (uploading, back up, cloud company, safe from viruses, Internet connection).
6. Central processor (read into output, save, execute, sequential set).
7. The basic CPU operations (four basic steps, fetch, decode, execute, write back).

Тексты для самостоятельной работы по теме «Digital Technologies»

Text A

Прочитайте текст и выполните задание.

Object-oriented Programming

One of the principal motivations for using Object-oriented Programming (OOP) is to handle multimedia applications in which such diverse data types as sound and video canbe packaged together into executable modules. Another is writing program code that's moreintuitive and reusable.

Perhaps the key feature of OOP is encapsulation-bundling data and program instructions intomodules called 'objects'. Here's an example ofhow objects work. An icon on a display screen might be called 'Triangles'. When the user selectsthe Triangles icon - which is an object composedof the properties of triangles andother data and instructions - a menu might appear on the screen offering several choices.

The choices may be: 1) create a new triangle and 2) fetch a triangle already in storage. The menu too, is an object, as are the choices on it. Each time a user selects an object, instructions inside the object are executed with whatever properties or data the object holds, to get to the next step. For instance, when the user wants to create a triangle, the application might execute a set of instructions that displays several types of triangles - right, equilateral, isosceles, and so on.

Many industry observers feel that the encapsulation feature of OOP is the natural tool for complex applications in which speech and moving images are

integrated with text and graphics. With moving images and voice built into the objects themselves, program developers avoid the sticky problem of deciding how each separate type of data is to be integrated and synchronized into a working whole. A second key feature of OOP is inheritance. This allows OOP developers to define one class of objects, say 'Rectangles', and a specific instance of this class, say 'Squares'

Thus, all properties of rectangles - 'Has 4 sides' and 'Contains 4 right angles' are automatically inherited by Squares. Inheritance is a useful property in rapidly processing business data.

A third principle behind OOP is polymorphism. This means that different objects can receive the same instructions but deal with them in different ways. For instance, if the user right clicks the mouse on 'Right triangle', a voice clip might explain the properties of right triangles. However, if the mouse is right clicked on 'Equilateral triangle' the voice instead explains properties of equilateral triangles.

The combination of encapsulation, inheritance and polymorphism leads to code reusability. 'Reusable code' means that new programs can easily be copied and pasted together from old programs. All one has to do is access a library of objects and stitch them into a working whole. This eliminates the need to write code from scratch and then debug it. Code reusability makes both program development and program maintenance faster.

WRITING TASK

Напишите эссе на английском языке о своем опыте программирования (язык программирования, который вы использовали, опишите практическую задачу, на решение которой была направлена программа).

Text B

Прочитайте текст и выполните задание.

The Internet of Things

What exactly is the Internet of Things, which is so popular today? Simply put, this means that machines, devices, vehicles, and other objects get access to Internet and/or locally deployed platforms that allow managing all these objects, and can be further connected with one another.

As technology is improving, the size of devices gets smaller and their power consumption is reduced as well. To apply Internet of Things technology (IoT) these small computers by themselves are not needed. In other words, they are not used as computers in the sense in which this term is applied to home computers; they are rather used for solving specific tasks. That is, they are needed to gather information from sensors or cameras and transfer it somewhere in a single place. These small devices are capable of communicating with either the common module – the hub, or

with each other (peer to peer). Then the hub transmits the collected data to the Internet on a cloud platform for processing.

Basic data transmission technologies include: Wi-Fi, Bluetooth, GSM modules, 3G/4G.

Today IoT solutions are applicable in a variety of spheres – manufacturing automation, "smart home", wearables, medicine and healthcare, and many more.

Although many examples of using the IoT have already become common for many people, some solutions are truly non-standard and are able to change the usual course of things in various areas of life.

Below are some outstanding applications of IoT.

BabyBe Company has developed a unique system which allows premature babies to feel the heartbeat, breathing motion and voice of their mothers whilst inside the incubator. This is achieved with the help of the complementary device for Incubators and that connects a mother with her premature baby by replicating the movement of her heartbeat and lungs.

Shockbox is a must-have device for collision sports. After being attached to a player's helmet, it is capable of measuring head impacts by means of sensor technology and Bluetooth. If the device detects that a player has experienced a hit that can potentially result in a concussion, it sends an alert to a coach's smartphone.

Siren Company has developed unique Diabetic Socks which are made of neurofabric – the first textile with the built-in microsensors. Based on the foot temperature changes data, this product diagnose diabetes in the early stages and prevent foot injuries.

Many IoT devices (say, a TV, a stereo system, a smart lighting system or a virtual assistant) are controlled with the help of voice commands gestures.

Looking at the benefits IoT solutions provide, it is fair to say that they give people a completely different level of comfort. This is especially true about the lives of households. However, despite the variety opportunities that have been discovered with IoT some people are beginning to worry that machines and devices are gaining more control over activities that humans previously performed. Are our lives completely controlled or is there still a sphere where man can live his usual human life?

WRITING TASK

Напишите эссе на английском языке о том, каким образом можно применить Интернет вещей: а) в сфере образования; б) в социальной сфере; в) в сфере производства.

Unit 2
Present Robotics

Text 1
Robotics

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: robotics, design, construction, operation, technology, action, radiation, nature, concept, bomb, nanorobot, medicine, intelligence
b) прилагательные: interdisciplinary, mechanical, sensory, human, classical, potential, various, practical
c) глаголы: use, substitute, replicate, create, manufacture, serve, manage, inject, revolutionize

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. Robotics is an interdisciplinary branch of engineering and science that includes **mechanical engineering**, **electronic engineering**, **information engineering**, **computer science**, and others.
2. Robotics deals with the **design**, **construction**, **operation** and **use of robots**.
3. These **technologies** are used to develop **machines** that can **substitute** for **humans** and **replicate human actions**.
4. Many of today's **robots** are inspired by **nature**, contributing to the field of **bio-inspired robotics**.
5. **Robotics** overlaps with **electronics**, **computer science**, **artificial intelligence**, **mechatronics**, **nanotechnology** and **bioengineering**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, определите основные сферы применения робототехники.

Образец: *Robotics includes mechanical engineering, electronic engineering, information engineering, computer science, and others.*

1. Robotics is … 2. Robotics includes … 3. Robotics involves …	a) an interdisciplinary branch of engineering and science b) mechanical engineering, electronic engineering, information engineering, computer science c) in dangerous environments, manufacturing processes, or where humans cannot survive d) the design, construction, operation and use of robots, as well as computer systems for their control

4. Robotics deals with …	e) the conception, design, manufacture, and operation of robots
5. Robots can be used …	

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **to include**, v – включать, состоять, содержать
2) **feedback**, n – обратная связь, ответная реакция
3) **processing**, n – обработка (данных)
4) **purpose**, n – цель, задача, назначение
5) **containment**, n – сдерживание, защитная оболочка, герметичность
6) **hazardous materials** – опасные материалы
7) **appearance**, n – внешний вид, наружность
8) **behavior**, n – поведение, поступок, действие
9) **perform**, v – выполнять, осуществлять
10) **inspire**, v – вызывать, вдохновлять
11) **contribute**, v – способствовать
12) **mine**, n – месторождение, рудник, шахта
13) **shipwreck**, n – кораблекрушение, затонувший корабль
14) **involve**, v – вовлекать, задействовать
15) **overlap**, v – совмещать

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Robotics

Robotics is an interdisciplinary branch of engineering and science that includes mechanical engineering, electronic engineering, information engineering, computer science, and others. Robotics deals with the design, construction, operation and use of robots, as well as computer systems for their control, sensory feedback, and information processing.

These technologies are used to develop machines that can substitute for humans and replicate human actions. Robots can be used in many situations and for lots of purposes, but today many are used in dangerous environments (including bomb detection and deactivation), manufacturing processes, or where humans cannot survive (e.g. in space, under water, in high heat, and clean up and containment of). Robots can take on any form but some are made to resemble humans in appearance. This is said to help in the acceptance of a robot in certain replicative behaviors usually performed by people. Such robots attempt to replicate walking, lifting, speech, cognition, or any other human activity. Many of today's robots are inspired by nature, contributing to the field of bio-inspired robotics.

The concept of creating machines that can operate autonomously dates back to classical times, but research into the functionality and potential uses of robots did not grow substantially until the 20-th century. Throughout history, it has been frequently assumed by various scholars, inventors, engineers, and technicians that robots will one day be able to mimic human behaviour and manage tasks in a human-like fashion. Today, robotics is a rapidly growing field, as technological advances continue; researching, designing, and building new robots serve various practical purposes, whether domestically, commercially, or militarily. Many robots are built to do jobs that are hazardous to people, such as defusing bombs, finding survivors in unstable ruins, and exploring mines and shipwrecks. Robotics is also used in STEM (science, technology, engineering and mathematics) as a teaching aid. The advent of nanorobots, microscopic robots that can be injected into the human body, could revolutionize medicine and human health.

Robotics is a branch of engineering that involves the conception, design, manufacture, and operation of robots. This field overlaps with electronics, computer science, artificial intelligence, mechatronics, nanotechnology and bioengineering.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) обработка информации	a) sensory feedback
2) сенсорная обратная связь	b) information processing
3) опасные материалы и радиация	c) bio-inspired robotics
4) быстро развивающаяся отрасль	d) conception, design, manufacture and operation of robots
5) машиностроение, электронная техника, информационная техника, информатика	e) a rapidly growing field
6) концепция, проектирование, производство и эксплуатация роботов	f) mechanical engineering, electronic engineering, information engineering, computer science
7) биотехнологическая робототехника	g) hazardous materials and radiation
8) попытка воспроизвести (скопировать)	h) manufacturing processes
9) опасные среды (включая обнаружение и обезвреживание бомб)	i) substitute for humans and replicate human actions
10) производственные процессы	j) attempt to replicate
11) заменять людей и воспроизводить человеческие действия	k) dangerous environments (including bomb detection and deactivation)

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Robotics includes …	a) hazardous to people, such as defusing bombs, finding survivors in unstable ruins, and exploring mines and shipwrecks.
2. Robotics deals with …	b) the conception, design, manufacture, and operation of robots.
3. Many robots are built to do jobs that are …	c) but today many are used in dangerous environments, manufacturing processes, or where humans cannot survive.
4. Robots can be used in many situations and for lots of purposes …	d) the design, construction, operation and use of robots, as well as computer systems for their control, sensory feedback, and information processing.
5. Robotics is a branch of engineering that involves …	e) mechanical engineering, electronic engineering, information engineering, computer science.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. Robotics deals … the design, construction, operation and use of robots.
2. These technologies are used … develop machines that can substitute … humans and replicate human actions.
3. The concept … creating machines that can operate autonomously dates back … classical times.
4. The advent … nanorobots, microscopic robots that can be injected … the human body, could revolutionize medicine and human health.
5. Robots are made to resemble humans in appearance to help … the acceptance … a robot … certain replicative behaviors usually performed … people.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. Robotics is an … branch of engineering and science.
   a) interdisciplinary; b) autonomous.
2. Robotics deals with the computer systems for sensory feedback and … .
   a) medicine and human health; b) information processing.
3. Machines can substitute for humans and … human actions.
   a) replicate; b) develop.
4. Research into the functionality and potential uses of robots did not grow substantially until the … .
   a) 21-st century; b) 20-th century.
5. Robotics is also used in … as a teaching aid.
   a) STEM; b) STEAM.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Робототехника является междисциплинарной отраслью техники и науки.
   (Robotics is an interdisciplinary branch of engineering and science.)
2. Робототехника занимается разработкой, производством, эксплуатацией и использованием роботов.
   (Robotics deals with the design, construction, operation and use of robots.)
3. Технологии используются для разработки машин, которые могут заменить людей и воспроизводить человеческие действия.
   (Technologies are used to develop machines that can substitute for humans and replicate human actions.)
4. Многие современные роботы вносят свой вклад в развитие биотехнологической робототехники.
   (Many of today's robots contribute to the field of bio-inspired robotics.)
5. Робототехника пересекается с электроникой, информатикой, искусственным интеллектом, мехатроникой, нанотехнологиями и биоинженерией.
   (Robotics overlaps with electronics, computer science, artificial intelligence, mechatronics, nanotechnology and bioengineering.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

Robotics deals with the **d**…, construction, **o**… and use of robots, as well as computer systems for their control, **s**…**f**… and information **p**… . Robots can be used in many situations and for lots of **p**…, but today many are used in **d**… **e**… (including bomb detection and deactivation), **m**… processes, or where humans cannot survive. Robots are made to resemble humans in **a**… . Such robots **a**… to **r**… walking, lifting, speech, cognition, or any other human activity. Many of today's robots are **i**… by **n**…, **c**… to the field of bio-inspired robotics.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What is robotics? (interdisciplinary branch)
2. What does roboticsinclude? (mechanical engineering, electronic engineering, information engineering, computer science)
3. What does robotics deal with? (design, construction, operation, use of robots, computer systems for control, sensory feedback, information processing)
4. What can machines do? (substitute for humans, replicate human actions)
5. What purposes are robots may usually be used for? (dangerous environments, jobs hazardous to people)
6. Why are some robots made to resemble humans in appearance? (to help in the acceptance of a robot)

7. What do you know about the history of robotics? (classical times, the 20-th century, functionality and potential uses of robots)
8. Speak about bio-inspired robotics and nanorobots (inspired by nature, microscopic robots, inject into the human body, revolutionize medicine)
9. What does the abbreviation «STEM» mean in robotics? (science, technology, engineering and mathematics, teaching aid)

ЗАДАНИЕ 13. Расскажите о робототехнике как о междисциплинарной отрасли по следующему плану, используя слова, данные в скобках.

1. Robotics as an interdisciplinary branch (mechanical engineering, electronic engineering, information engineering, computer science).
2. Spheres of application of robotics (design, construction, operation, use of robots, computer systems for control, sensory feedback, information processing).
4. Main functions of machines (substitute for humans, replicate human actions).
5. Main purposes for robots usage (dangerous environments, jobs hazardous to people, medicine, teaching aid).
6. The history of robotics (functionality and potential uses of robots, bio-inspired robotics, nanorobots).
7. Robotics and other sciences (electronics, computer science, artificial intelligence, mechatronics, nanotechnology and bioengineering).

Text 2
Robotic Aspects

ЗАДАНИЕ 1. Прочитайте интернациональные слова и определите их значения, обращая внимание на части речи:

a) существительные: aspect, type, application, track, form, function, frame, shape, physics, electricity, battery, motor, signal, position, energy, status, operation sensor, code, program, essence;
b) прилагательные: robotic, diverse, electrical, basic, correct, hybrid;
c) глаголы: control, originate, start, activate.

ЗАДАНИЕ 2. Прочитайте предложение и догадайтесь о значении выделенных слов.

1. There are many **types of robots**, although being very **diverse in application and form** they all share three basic similarities when it comes to their **construction**.
2. Robots all have some kind of **mechanical construction**, a **frame**, **form** or **shape** designed to achieve a **particular** task.
3. Robots have **electrical components** which power and **control the machinery**.

4. All robots **contain** some level of **computer programming code**.
5. There are three different types of **robotic programs**: **remote control**, **artificial intelligence** and **hybrid**.

ЗАДАНИЕ 3. Используя образец и выражения, данные справа, определите основные сходные черты устройства роботов.

Образец: *Robots all share <u>three basic similarities when it comes to their construction.</u>*

1. Robots all share …	a) some level of computer programming code
2. Robots all have …	b) electrical components which power and control the machinery
3. Robots have …	c) three basic similarities when it comes to their construction
4. All robots contain …	d) some kind of mechanical construction, a frame, form or shape designed to achieve a particular task

ЗАДАНИЕ 4. Познакомьтесь со словами и словосочетаниями, которые помогут вам понять текст:

1) **application**, n – применение, использование
2) **similarity**, n – сходство, общая черта
3) **although**, adv. – несмотря на то, хотя
4) **achieve**, v – достигать, выполнять
5) **caterpillar**, adj. – гусеничный
6) **complete**, v – завершить, выполнить
7) **assign**, v – назначать, отводить
8) **power machinery** – приводить в действие машинное оборудование
9) **wire**, n – провод, кабель
10) **electrical circuit** – электрическая цепь, замыкание
11) **measure**, v – измерять
12) **petrol**, n – бензин, горючее, топливо
13) **encounter**, v – сталкиваться, натолкнуться
14) **supply**, v – поставлять, снабжать
15) **incorporate**, v – включать в себя, содержать

ЗАДАНИЕ 5. Прочитайте и переведите текст.

Robotic Aspects

There are many types of robots. They are used in many different environments and for many different uses, although being very diverse in application and form they all share three basic similarities when it comes to their construction.

1. Robots all have some kind of mechanical construction, a frame, form or shape designed to achieve a particular task. For example, a robot designed to travel across heavy dirt or mud, might use caterpillar tracks. The mechanical aspect is mostly the creator's solution to completing the assigned task and dealing with the physics of the environment around it. Form follows function.

2. Robots have electrical components which power and control the machinery. For example, the robot with caterpillar tracks would need some kind of power to move the tracker treads. That power comes in the form of electricity, which will have to travel through a wire and originate from a battery, a basic electrical circuit. Even petrol powered machines that get their power mainly from petrol still require an electric current to start the combustion process which is why most petrol powered machines like cars, have batteries. The electrical aspect of robots is used for movement (through motors), sensing (where electrical signals are used to measure things like heat, sound, position, and energy status) and operation (robots need some level of electrical energy supplied to their motors and sensors in order to activate and perform basic operations)

3. All robots contain some level of computer programming code. A program is how a robot decides when or how to do something. In the caterpillar track example, a robot that needs to move across a muddy road may have the correct mechanical construction and receive the correct amount of power from its battery, but would not go anywhere without a program telling it to move. Programs are the core essence of a robot, it could have excellent mechanical and electrical construction, but if its program is poorly constructed its performance will be very poor (or it may not perform at all).

There are three different types of robotic programs: remote control, artificial intelligence and hybrid. A robot with remote control programming has a preexisting set of commands that it will only perform if and when it receives a signal from a control source, typically a human being with a remote control. Robots that use artificial intelligence interact with their environment on their own without a control source, and can determine reactions to objects and problems they encounter using their preexisting programming. Hybrid is a form of programming that incorporates both AI and RC functions.

ЗАДАНИЕ 6. Найдите в тексте английские эквиваленты следующих русских слов и словосочетаний.

1) три основных сходства роботов	a) hybrid programming
2) выполнить конкретную задачу	b) artificial intelligence
3) гусеничный	c) remote control programing
4) основная электрическая схема	d) the core essence of a robot
5) требовать электрического тока	e) the correct amount of power
6) измерять тепло, звук, положение, состояние энергии	f) caterpillar

7) необходимое количество энергии	g) to require an electric current
8) основная сущность робота	h) a basic electrical circuit
9) программа дистанционного управления	i) to measure heat, sound, position, energy status
10) искусственный интеллект	j) to achieve a particular task
11) гибридное программирование	k) three basic similarities of robots

ЗАДАНИЕ 7. Соедините части предложений по смыслу.

1. Robots all have some kind of …	a) movement, sensing and operation.
2. Robots have electrical components …	b) a robot decides when or how to do something.
3. The electrical aspect of robots is used for …	c) remote control, artificial intelligence and hybrid.
4. A program is how …	d) which power and control the machinery.
5. There are three different types of robotic programs: …	e) mechanical construction, a frame, form or shape designed to achieve a particular task.

ЗАДАНИЕ 8. Вставьте необходимые предлоги.

1. A robot designed to travel … heavy dirt or mud, might use caterpillar tracks.
2. The robot … caterpillar tracks would need some kind … power to move the tracker treads.
3. The electrical aspect … robots is used … movement, sensing and operation.
4. Robots that use artificial intelligence interact … their environment … their own … a control source.
5. Hybrid is a form … programming that incorporates both AI and RC functions.

ЗАДАНИЕ 9. Выбрав правильный вариант, закончите следующие предложения.

1. There are …types of robots.
   a) many; b) much.
2. … follows … .
   a) Form /function; b) Function / form.
3. The power comes in the form of electricity, which will have to travel through a wire and originate from a battery, … .
   a) petrol; b) a basic electrical circuit.
4. Programs are … of a robot.
   a) the core essence; b) excellent mechanical and electrical construction.
5. There are … different types of robotic programs.
   a) five; b) three.

ЗАДАНИЕ 10. Подтвердите словами из текста, что:

1. Существует множество типов роботов, которые очень разнообразны по применению и форме.
   (There are many types of robots being very diverse in application and form.)
2. Все роботы имеют некую механическую конструкцию, предназначенную для выполнения определенной задачи.
   (Robots all have some kind of mechanical construction designed to achieve a particular task.)
3. Роботы имеют электрические компоненты, которые приводят в действие и управляют оборудованием.
   (Robots have electrical components which power and control the machinery.)
4. Все роботы поддерживают некоторый уровень компьютерного программного кода.
   (All robots contain some level of computer programming code.)
5. Существует три различных типа роботизированных программ.
   (There are three different types of robotic programs.)

ЗАДАНИЕ 11. Читайте текст, вставляя пропущенные слова, которые соответствуют тексту.

There are many types of robots for many different spheres of **a**… and form. The mechanical **a**… is mostly the creator's solution to **c**… the a… task and dealing with the **p**… of the environment around it. Even **p**… powered machines still require an electric current to **s**… the combustion process. In the **c**… track example, a robot that needs to move across a muddy road may have the correct mechanical construction and receive the correct amount of power from its battery, but would not go anywhere without a **p**… telling it to move.

ЗАДАНИЕ 12. Ответьте на вопросы, используя слова, данные в скобках.

1. What do you know about different types of robots? (different environments, different uses, diverse in application and form, three basic similarities)
2. What is mechanical construction of a robot? (frame, form, shape, to achieve a particular task)
3. What are the main functions of electrical components? (power and control the machinery)
4. Why programs may beconsidered as «the core essence» of a robot? (program poorly constructed, very poor performance)
5. What are three different types of robotic programs? (remote control, artificial intelligence, hybrid)
6. How does remote controlprogramming work? (preexisting set of commands, to receive a signal from a control source - typically a human being)

7. What is «artificial intelligence»? (to interact with the environment, without a control source, to determine reactions to objects and problems)
8. Speak about hybrid programming (to incorporate both AI and RC functions)

ЗАДАНИЕ 13. Расскажите о робототехнике и основных сходных чертах устройства роботов по следующему плану, используя слова, данные в скобках.

1. Types of robots and their diverse application (three basic similarities of construction).
2. Mechanical construction of robots (frame, form, shape, a particular task or function).
3. Electrical components of robots (power and control the machinery, a battery, a basic electrical circuit, petrol powered machines, an electric current).
4. Computer programming code (a robot decides when or how to do something).
5. Three different types of robotic programs (remote control, artificial intelligence, hybrid).

Тексты для самостоятельной работы по теме «Present Robotics»

Text A

Прочитайте текст и выполните задание.

Human-Robot Interaction: Speech and Gesture Recognition

The state of the art in sensory intelligence for robots will have to progress through several orders of magnitude if we want the robots working in our homes to go beyond vacuum-cleaning the floors. If robots are to work effectively in homes and other non-industrial environments, the way they are instructed to perform their jobs and especially how they will be told to stop will be of critical importance. The people who interact with them may have little or no training in robotics, and so any interface will need to be extremely intuitive. Science fiction authors also typically assume that robots will eventually be capable of communicating with humans through speech, gestures, and facial expressions, rather than a command-line interface. Although speech would be the most natural way for the human to communicate, it is unnatural for the robot.

Speech recognition

Interpreting the continuous flow of sounds coming from a human, in real time, is a difficult task for a computer, mostly because of the great variability of speech. The same word, spoken by the same person may sound different depending on local acoustics, volume, the previous word, whether or not the speaker has a cold, etc. It becomes even harder when the speaker has a different accent. Currently, the best

systems can recognize continuous, natural speech, up to 160 words per minute, with an accuracy of 95%. With the help of artificial intelligence, machines nowadays can use people's voice to identify their emotions such as satisfied or angry.

Robotic voice

Other hurdles exist when allowing the robot to use voice for interacting with humans. For social reasons, synthetic voice proves suboptimal as a communication medium, making it necessary to develop the emotional component of robotic voice through various techniques. An advantage of diaphonic branching is the emotion that the robot is programmed to project, can be carried on the voice tape, or phoneme, already pre-programmed onto the voice media.

Gesture recognition

One can imagine, in the future, explaining to a robot chef how to make a pastry, or asking directions from a robot police officer. In both of these cases, making hand gestures would aid the verbal descriptions. In the first case, the robot would be recognizing gestures made by the human, and perhaps repeating them for confirmation. In the second case, the robot police officer would gesture to indicate "down the road, then turn right". It is likely that gestures will make up a part of the interaction between humans and robots.

WRITING TASK

Напишите эссе на английском языке на тему «Human-Robot Interaction: Speech and Gesture Recognition».

Text B

Прочитайте текст и выполните задание.

Human-Robot Interaction: Artificial Emotions and Social Intelligence

Facial expressions can provide rapid feedback on the progress of a dialogue between two humans, and soon may be able to do the same for humans and robots. Robotic faces have been constructed by Hanson Robotics using their elastic polymer called Frubber, allowing a large number of facial expressions due to the elasticity of the rubber facial coating and embedded subsurface motors (servos). The coating and servos are built on a metal skull. A robot should know how to approach a human, judging by their facial expression and body language. Whether the person is happy, frightened, or crazy-looking affects the type of interaction expected of the robot. Likewise, robots like Kismet and the more recent addition, Nexican produce a range of facial expressions, allowing it to have meaningful social exchanges with humans.

Artificial emotions can also be generated, composed of a sequence of facial expressions and/or gestures. To simplify this programming in the movie, presets were created together with a special software program. This decreased the amount of time

needed to make the film. These presets could possibly be transferred for use in real-life robots.

Many of the robots of science fiction have a **personality**, something which may or may not be desirable in the commercial robots of the future. Nevertheless, researchers are trying to create robots which appear to have a personality: i.e. they use sounds, facial expressions, and body language to try to convey an internal state, which may be joy, sadness, or fear. One commercial example is Pleo, a toy robot dinosaur, which can exhibit several apparent emotions.

The Socially Intelligent Machines Lab of the Georgia Institute of Technology researches new concepts of guided teaching interaction with robots. The aim of the projects is a social robot that learns task and goals from human demonstrations without prior knowledge of high-level concepts. These concepts can be used to transfer knowledge to future tasks, resulting in faster learning of those tasks. The results are demonstrated by the robot Curi who can scoop some pasta from a pot onto a plate and serve the sauce on top.

WRITING TASK

Подготовьте презентацию на английском языке на тему «Human-Robot Interaction: Artificial Emotions and Social Intelligence».

ЗАКЛЮЧЕНИЕ

Коллективное учебное пособие «Английский язык для студентов архитектурно-строительных специальностей» представляет одно из немногих существующих изданий, предназначенных для студентов бакалавриата и специалитета, изучающих английский язык в строительных вузах.

Пособие создано в соответствии с программой «Иностранный язык» для неязыковых вузов и факультетов и рассчитано на 216 часов (108 часов аудиторных занятий и 108 часов самостоятельной работы).

В предлагаемом пособии представлен учебный материал по всем основным направлениям архитектурно-строительных вузов. Пособие отличается последовательностью и единым структурным оформлением, и позволит обучаемым приобрести навыки профессионально-ориентированной устной и письменной коммуникации на английском языке.

В пособие включены тексты для групп таких специальностей, как «Строительство мостов и тоннелей», «Промышленное и гражданское строительство», «Архитектура, градостроительство, дизайн архитектурной среды», «Сохранение и реставрация культурного наследия», «Строительный менеджмент», «Строительство автомобильных дорог», «Пожарная безопасность в строительстве», «Землеустройство и кадастры», «Отопление и кондиционирование воздуха» и др. Пособие нацелено на обучение студентов навыкам чтения, перевода, пересказа по строительным специальностям и умение вести беседы на профессиональные темы.

Учебное пособие состоит из 7 тематических частей (Part), каждая из которых состоит из нескольких разделов (Unit), посвященных соответствующим строительным направлениям.

Первая часть каждого раздела включает два текста и систему упражнений на закрепление лексики, пополнение активного словаря и развития навыков профессионально-ориентированной устной и письменной речи.

Вторая часть каждого раздела включает в себя тексты для самостоятельной работы, тематически развивающие основной текст. Задания после текстов для самостоятельной работы могут быть выполнены в письменном виде, что также представляется значимым, поскольку письмо является необходимым условием формирования навыков грамотной речи на иностранном языке.

Авторы надеются, что материал данного учебного пособия послужит Вам основой для использования знаний по английскому языку в рамках коммуникации: «Английский язык для специальных/профессиональных целей».

БИБЛИОГРАФИЧЕСКИЙ СПИСОК

Part I. INDUSTRIAL AND CIVIL ENGINEERING

1. Английский язык для строительных вузов: учеб. пособие; под. ред. З. Е. Фоминой / Воронеж. гос. арх.-строит. ун-т. – Воронеж.
2. Roberts Michail. What Does a Civil Engineer Do? – URL: https://www.thebalancecareers.com/government-job-profile-civil-engineer-1669624
3. Urban Securipedia. Public services and facilities. – URL: https://securipedia.eu/mediawiki/index.php/Public_services_and_facilities (время обращения: 08.07.2019).
4. Connective Cities, URL: https://www.connective-cities.net/en/topics/municipal-services/ (время обращения: 08.07.2019).
5. City Facility, URL: http://city-facility.rs/en/ (время обращения: 09.07.2019).
6. Geographycasestudy.com, URL: https://geographycasestudysite.wordpress.com/urban-systems/ (времяобращения – 09.07.2019).
7. Urban Securipedia, URL: https://securipedia.eu/mediawiki/index.php/Public_services_and_facilities(времяобращения – 09.07.2019).
8. Unhabitat, URL: https://unhabitat.org/expertise/3-urban-economy/ (время обращения – 09.07.2019).
9. Wikipedia, URL: https://en.wikipedia.org/wiki/Urban_economics(время обращения – 09.07.2019).
10. Wikipedia, URL: https://en.wikipedia.org/wiki/Hard_infrastructure (время обращения - 09.07.2019). Geographycasestudy. com, URL: https://geographycasestudysite.wordpress.com/urban-systems/. (времяобращения - 09.08.2019).
11. Microsoft Word – 7_2_grover.doc, URL: https://www.fig.net/resources/proceedings/2008/verona_am_2008_comm7/papers/12_sept/7_2_grover.pdf (времяобращения 19.07. 2019).
12. The Role of Geography in Land-Use Planning, URL: https://www.thoughtco.com/land-use-planning-1435786 (времяобращения 19.07. 2019).
13. Land-use planning – Wikipedia, URL: https: // en.wikipedia.org/wiki/Land-use_planning(времяобращения 19.07. 2019).
14. Conservation Practices for Landlords, URL: https://www.extension.iastate.edu/agdm/crops/html/a1-41.html (времяобращения 19.07. 2019).
15. GISGeography, URL: https://gisgeography.com/geodesy/ (времяобращения – 10.07.2019).
16. The National Academy of Science Engineering Medicine, URL: https://www.nap.edu/read/12954/chapter/4 (времяобращения – 10.07.2019).

17. Sciencing, URL: https://sciencing.com/difference-between-geoid-ellipsoid-8638149.html (время обращения 12.07.2019).
18. TheGIS 2 GPSPortal, URL: https://www.gis2gps.com/GPS/GPSDEF/gpsdef.html (время обращения - 13.07.2019).
19. Locata, URL: http://www.locata.com/applications-of-gps/civilian-applications/(время обращения - 13.07.2019).
20. Anzlic Committee on Surveying and Mapping, URL: https://www.icsm.gov.au/zero-priceless-importance-geodesy (времяобращения - 13.07.2019).

Part II. BUILDING MATERIALS

1. Wikipedia, URL: https://en.wikipedia.org/wiki/Architectural_glass (время обращения - 16.08.2019).
2. PatriziaCaruzzo, Flash on English for Construction, ESP Series, 2012, 47 p., p.15.
3. Advanced Building Materials Making New Construction More Sustainable. URL: https://gulpmatrix.com/advanced-building-materials/ (времяобращения: 16.08. 2019).
4. FutureProof, URL: https://www.futuresplatform.com/blog/transparent-wood (время обращения - 12.08.2019).
5. Wikipedia, URL: https://en.wikipedia.org/wiki/Transparent_wood_composites (время обращения - 12.08.2019).
6. What are the latest modern construction materials, URL: https://geniebelt.com/blog/10-innovative-construction-materials (времяобращения – 12.08. 2019).
7. WiseGeek, URL: https://www.wisegeek.com/does-bendable-concrete-exist.htm (время обращения – 12.08. 2019).

Part III. ARCHITECTURE, RESTORING AND TOWN PLANNING

1. JukkaJokilehto, A history of architectural conservation. – Butterworth-Heinemann, 2002, 354 p.
2. Архитектура сегодня (archdaily), URL: https://www.archdaily.com/558958/spotlight-sir-christopher-wren(время обращения 30.09. 2019).
3. Архитектура сегодня (archdaily), URL: https://www.archdaily.com/catalog/us/products/12673/green-facades-jakob?ad_medium=nimrod&ad_name=smart-widget&ad_category=smart-widget(время обращения 30.09. 2019).

4. Архитектура сегодня (archdaily), URL: https://www.archdaily.com/913748/case-study-houses-lessons-on-modern-low-budget-and-easy-to-build-living-spaces(время обращения 30.09. 2019).
5. Архитектура сегодня (archdaily), URL: https: // www.archdaily.com/921233/dune-square-bureau-druzhba?ad_source=search&ad_medium=search_result_projects(время обращения 30.09. 2019).
6. Ивянская И.С.Английский язык для архитекторов: учебник / И.С. Ивянская. —2-е изд., перераб. и доп. — М.: КУРС : ИНФРА-М, 2014. — 400 с.
7. Архитектура сегодня (archdaily), URL: https://www.archdaily.com/926361/wakandas-afro-futuristic-masterplan-an-ecosystem-of-flexible-bim-structures-for-urban-nomads?ad_name=flyout&ad_medium=Articles(время обращения 30.09. 2019).
8. Архитектура сегодня (archdaily), URL: https://www.archdaily.com/923308/niederhafen-river-promenade-zaha-hadid-architects?ad_source=search&ad_medium=search_result_projects(время обращения 30.09. 2019).

Part IV. ROAD ENGINEERING

1. Road Construction: History and Current Methods, URL: https://www.brighthubengineering.com/structural-engineering/59665-road-construction-history-and-procedure/(времяобращения: 12.05.2019).
2. Comparison between Flexible Pavement and Rigid Pavement in Highway Construction, URL: http://www.basiccivilengineering.com/2015/04/comparison-between-flexible-pavement.html (времяобращения: 12.05.2019).
3. Environmental impacts of roads. Wikipedia, URL: http://en.wikibedia.ru /wiki/Environmental_impacts_of_roads (времяобращения: 12.06.2019)
4. Roads in the United Kingdom. Wikipedia, URL: http:// en.wikipedia.org/wiki/Roads_in_the_United_Kingdom (времяобращения: 12.06.2019).
5. https://helpiks.org/ (время обращения – 28.06.2019 г.)
6. https://www.explainthatstuff.com/bridges.html (время обращения - 08.07.2019 г.)
7. https://theconstructor.org/construction/tunnel-construction-methods/17167/ (08.07.2019 г.)
8. Wikipedia, URL: https: // en. wikipedia .org/wiki /Mechanical _engineering (времяобращения - 1.08.2019).
9. Constructionkenya, URL: https: // www. constructionkenya .com/2408/road-construction-equipment-defined/ (времяобращения – 1.08.2019).

10. Livescience, URL:https://www.livescience.com/47551-mechanical-engineering.html (время обращения - 1.08.2019.
11. Powderprocess, URL: https://www.powderprocess.net/Dosing.html (время обращения - 1.08.2019.

Part V. ENGINEERING SYSTEMS AND CONSTRUCTIONS

1. Types of Ventilation Systems, URL: https: // www. hometips. com/how-it-works/ ventilation-systems-exhaust.html (время обращения 07.07. 2019).
2. Radiant & Conductive Heating Sustems – LOW-TECH MAGAZINE, URL: https://www.lowtechmagazine.com/2015/03/radiant-and-conductive-heating-systems.html (время обращения 08.07. 2019).
3. Alternative Energy Sources – Solar, Wind, Geothermal, Biomass, Ocean and other energy sources,URL: https://www.conserve-energy-future.com/alternativeenergysources.php (времяобращения 11.07. 2019.
4. Types of HVAC Systems, URL: https://www.intechopen.com/books/hvac-system/types-of-hvac-systems (время обращения 12.07. 2019.
5. WaterSources,URL: http://www.watersources.co.za/(времяобращения 12.07. 2019).
6. What is Sewage Treatment (with pictures), URL: https://www.wisegeek.com/what-is-sewage-treatment.htm (времяобращения 12.07. 2019.
7. Water Distribution System Challenges And Solutions, URL: https://www.wateronline.com/doc/water-distribution-system-challenges-and-solutions-0001 (времяобращения 12.07. 2019.
8. Carbon filtering – Wikipedia, URL: https://en.wikipedia.org/wiki/Carbon_filtering (времяобращения 17.07. 2019).
9. Water filter – Wikipedia, URL: https://en.wikipedia.org/wiki/Water_filter (времяобращения 17.07. 2019).
10. How do water filters work? URL: https:// www. explain that stuff .com / how water filters work.html (времяобращения 17.07. 2019).
11. Ion Exchange – an overview, URL: https://www.sciencedirect.com/topics/engineering/ion-exchange (времяобращения 17.07. 2019).
12. Distillation Treatment and Removal of Contaminants from Drinking Water, URL: https://www.iwapublishing.com/news/distillation-treatment-and-removal-contaminants-drinking-water (времяобращения 17.07. 2019).
13. https://mybiblioteka.su/tom2/3-151178.html (время обращения - 05.07.2019 г.)
14. https://theconstructor.org/practical-guide/safety-procedures-construction-site/13412/ (время обращения – 12.07.2019 г.)
15. https://theconstructor.org (время обращения – 12.07.2019 г.)

16. https://www.yellowpagesvn.com (время обращения – 06.07.2019 г.)
17. https://www.constructconnect.com/ (время обращения – 13.07.2019 г.)

Part VI. ECONOMICS AND INNOVATION IN CONSTRUCTION

1. McArthur, T. A Rapid Course in English for Students of Economics. – Oxford Univ. Press, 1996.
2. Mc Arthur, T. A Rapid Course in English for Students of Economics. – Oxford Univ. Press, 1996.
3. Английский для экономистов и менеджеров: учебное пособие/ О.В. Ульянова, С.В. Гричин. – Томск: Изд-во Томского политехнического университета, 2011. – 111с.
4. Английский язык для экономистов: учебник для академического бакалавриата/ В.В. Левченко, Е.Е. Долголева, О.В. Мещерякова. – М.: Издательство Юрайт, 2016. – 351 с. – Серия: Бакалавр. Академический курс.
5. Уваров, В. И. Английский язык для экономистов + cd : учебник и практикум для прикладного бакалавриата / В. И. Уваров. — Москва : Издательство Юрайт, 2017. — 356 с. — (Бакалавр. Академический курс). — ISBN 978-5-534-01387-0. — Текст : электронный // ЭБС Юрайт [сайт]. — URL: https://biblio-online.ru/bcode/399817 (дата обращения: 05.10.2019).
6. https://www.cleverism.com/innovation-process-definition-models-tips/ (время обращения -09.07.2019 г.)
7. https://okfil.biz/en/innovations-in-construction/ (время обращения – 10.07.2019 г.)
8. https://theconstructor.org/tips/tips-for-innovations-in-construction-materials-and-equipments/13004/ (время обращения – 11.07.2019 г.)
9. https://www.quora.com/What-is-construction-technology (время обращения - 13.07.2019 г.)
10. Wikipedia, URL: https://en.wikipedia.org/wiki/Management (время обращения - 16.08.2019).
11. Five Functions of Management by Henri Fayol | ToolsHero, URL: https://www.toolshero.com/management/five-functions-of-management/ (времяобращения - 16.08.2019).
12. Wikipedia, URL: https://en.wikipedia.org/wiki/Organization (время обращения - 16.08.2019).
13. Wikipedia, URL: https://en.wikipedia.org/wiki/Company (время обращения - 16.08.2019).
14. Тябина Д.А., Хакимзянова Д.Ф., Хованская Е.С. PRisEverywhere: JustLookandSee / Тябина Д.А., Хакимзянова Д.Ф., Хованская Е.С. – Казань: Казан. ун-т, 2014. – 100 с.

Part VII. COMPUTING TECHNOLOGIES

1. Wikipedia, URL: https://en.wikipedia.org/wiki/Information_technology (время обращения - 18.07.2019).
2. Techopedia, URL: https://www.techopedia.com/definition/6597/computing (время обращения - 18.07.2019).
3. Wikipedia, URL: https://en.wikipedia.org/wiki/Robotics (время обращения - 18.07.2019).
4. Ecomputernotes, URL: http://ecomputernotes.com/fundamental/introduction-to-computer/what-is-computer (время обращения - 14.07.2019).
5. GCFGlobal, URL: https://edu.gcfglobal.org/en/computerbasics/what-is-a-computer/1/ (время обращения - 14.07.2019).
6. TechFAQ, URL: http://www.tech-faq.com/what-are-computers-used-for.html (время обращение - 14.07.2019).
7. Computer Science, URL: http://theteacher.info/index.php/f451-fundamentals/3-1-1-components/notes/50-i-o-s (времяобращения - 14.07.2019).
8. Buzzle. [Электронный ресурс]. – Режим доступа: http://www.buzzle.com/articles/what-are-the-main-parts-of-the-computer.html (время обращения: 13.08.2016).
9. Glendinning Eric H., McEwan John Oxford English for Information Technology [Text] / Eric H Glendinning., John McEwan. - Oxford University Press, 2002. - 222 p., p.153.
10. Information, Service, Systems, URL: https://issart.com/blog/internet-of-things-the-endless-possibilities-for-any-sphere/ (времяобращения – 14.07.2019).
11. Wikipedia, URL: https://en.wikipedia.org/wiki/Robotics (время обращения - 17.08.2019).
12. Wikipedia, URL: https://en.wikipedia.org/wiki/Robotics#Applications (время обращения - 17.08.2019).

ОГЛАВЛЕНИЕ

Введение 3
Part I. INDUSTRIAL AND CIVIL ENGINEERING 5
Unit 1. Industrial and Civil Engineering 5
Text 1. Some Basic Problems in Construction 5
Text 2. Engineering and Its Present Status 11
Тексты для самостоятельной работы 15
Unit 2. Municipal Service and Facilities 18
Text 1. City Infrastructure 18
Text 2. City Facilities 23
Тексты для самостоятельной работы 27
Unit 3. Urban Cadastre 29
Text 1. Land Administration in the UK 29
Text 2. Components of Planning Urban Areas 34
Тексты для самостоятельной работы 39
Unit 4. Geodesy 41
Text 1. The Science of Geodesy 41
Text 2. The Difference between Geoid and Ellipsoid 45
Тексты для самостоятельной работы 49
Part II. BUILDING MATERIALS 52
Unit 1. Modern Building Materials 52
Text 1. Modern Architectural Glass 52
Text 2. Advanced Building Materials 57
Тексты для самостоятельной работы 62
Part III. ARCHITECTURE, RESTORING AND TOWN PLANNING 65
Unit 1. Architecture 65
Text 1. Architecture and Sphere of its Influence 65
Text 2. Architectural Education in Russia 70
Тексты для самостоятельной работы 75
Unit 2. Designing and its Development 77
Text 1. Design and its Early History 77
Text 2. The Process of Designing 82
Тексты для самостоятельной работы 86
Unit 3. Restoration and Conservation 88
Text 1. Conservation and Restoration of Cultural Heritage 88
Text 2. The Restoration of Heritage Buildings 93
Тексты для самостоятельной работы 98

Unit 4. Town Planning 100
Text 1. Town Planning as a Professional Sphere 100
Text 2. Types of Towns According to Their Plans 105
Тексты для самостоятельной работы 110
Part IV. ROAD ENGINEERING 112
Unit 1. Road Construction 112
Text 1. Road Construction Techniques 112
Text 2. Comparison between Flexible and Rigid Pavement in Highway Construction 117
Тексты для самостоятельной работы 122
Unit 2. Bridges and Tunnels 125
Text 1. Bridge Construction 125
Text 2. Basic Tunneling System 128
Тексты для самостоятельной работы 132
Unit 3. Mechanical Engineering 134
Text 1. History of Mechanical Engineering 134
Text 2. The Most Powerful Road Construction Equipment 139
Тексты для самостоятельной работы 144
Part V. ENGINEERING SYSTEMS AND CONSTRUCTIONS 147
Unit 1. Heating, Ventilation and Air Conditioning 147
Text 1. Types of Ventilation Systems 147
Text 2. Modern Radiant Heating 153
Тексты для самостоятельной работы 158
Unit 2. Water Supply and Water Disposal 160
Text 1. Water Sources 160
Text 2. Sewage Treatment 165
Тексты для самостоятельной работы 170
Unit 3. Technosphere Safety in Construction 173
Text 1. Basic Principles of Fire Protection 173
Text 2. Safety Procedures at Construction Site 176
Тексты для самостоятельной работы 180
Part VI. ECONOMICS AND INNOVATION IN CONSTRUCTION 183
Unit 1. Economics and Finance 183
Text 1. Economics as a Science 183
Text 2. Construction Economics 188
Тексты для самостоятельной работы 193

Unit 2. Innovation 196
Text 1. What Is Innovation? 196
Text 2. Innovations in Construction..... 200
Тексты для самостоятельной работы 204
Unit 3. Management..... 206
Text 1. Management..... 206
Text 2. Five Functions of Management 211
Тексты для самостоятельной работы 217
Unit 4. Public Relations and Advertising..... 219
Text 1. Advertising and Public Relations 219
Text 2. Related Sciences (Advertising, Marketing and Journalism)..... 224
Тексты для самостоятельной работы 228
Part VII. COMPUTING TECHNOLOGIES 232
Unit 1. Digital Technologies 232
Text 1. What is Computer?..... 232
Text 2. Input, Output and Storage Devices 238
Тексты для самостоятельной работы 242
Unit 2. Present Robotics..... 245
Text 1. Robotics 245
Text 2. Robotic Aspects 250
Тексты для самостоятельной работы 255
Заключение..... 258
Библиографический список..... 259

Учебное издание

Лукина Людмила Владимировна
Козлова Виктория Вячеславовна
Лавриненко Ирина Юрьевна
Меркулова Надежда Вячеславовна
Гайдук Ирина Викторовна
Нестерова Ольга Федоровна
Крячко Лилия Николаевна
Рыжков Олег Игоревич
Коновалова Юлия Сергеевна

АНГЛИЙСКИЙ ЯЗЫК ДЛЯ СТУДЕНТОВ АРХИТЕКТУРНО-СТРОИТЕЛЬНЫХ СПЕЦИАЛЬНОСТЕЙ

Учебное пособие

Под общей редакцией д-ра филол. наук В. А. Федорова

Компьютерная верстка – В. В. Козлова

Дизайн обложки – Л. В. Емцева, А. О. Гридин

Отпечатано в авторской редакции

Подписано в печать 23.03.2020.
Формат 60×84 1/16. Бумага для множительных аппаратов.
Усл. печ. л. 15,6. Тираж 484 экз. Заказ № 44.

ФГБОУ ВО «Воронежский государственный технический университет»
394026 Воронеж, Московский проспект, 14

Участок оперативной полиграфии издательства ВГТУ
394026 Воронеж, Московский проспект, 14