**МИНИСТЕРСТВО ОБРАЗОВАНИЯ СТАВРОПОЛЬСКОГО КРАЯ**

**ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ПРОФЕССИОНАЛЬНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ**

**«СТАВРОПОЛЬСКИЙ СТРОИТЕЛЬНЫЙ ТЕХНИКУМ»**

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**ПО ДИСЦИПЛИНЕ**

**«ИНОСТРАННЫЙ ЯЗЫК В ПРОФЕССИОНАЛЬНОЙ ДЕЯТЕЛЬНОСТИ»**

 для студентов 2 курса очной и заочной формы обучения

специальности 08.02.08 Монтаж и эксплуатация оборудования и систем газоснабжения

**Ставрополь, 2022**



**Пояснительная записка**

На современном этапе развития образования одной из наиболее актуальных проблем является необходимость улучшения знания иностранного языка. Успешное овладение иностранным языком – необходимое условие получения интересной работы в стране и за её пределами, для профессионального роста, для укрепления дружбы с представителями различных стран.

Настоящее учебно-методическое пособие предназначено для студентов 2 курса специальности 08.02.08 Монтаж и эксплуатация оборудования и систем газоснабжения.

 Цель пособия – развить умения и навыки чтения текстов строительной тематики, способствовать развитию умения воспринимать информацию и умения выразить в письменной и устной форме собственные суждения о прочитанном, развить стремление к изучению иностранного языка,

создать условия для творческой самореализации учащихся и их личностного развития, привлечь к интеллектуальной и творческой деятельности.

Тематика пособия ориентирована на выбор будущей профессии и продолжение образования. К концу работы над пособием студенты должны овладеть устной и письменной речью на английском языке в пределах пройденной лексики и грамматики. В пособие включены лексико-грамматические упражнения, позволяющие закрепить ранее изученный материал.

 Пособие можно использовать в аудиторной и самостоятельной работе.

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 **Unit One**

**Engineering Communications**

 **Part I**

**Engineering Communications**

**I. Read and learn the following words and word combinations**

drafting **–** проект, чертёж, планplumber **--** сантехник

heating **--** отоплениеto lay pipes **–** прокладывать трубы

drainage **--** канализацияwater supply **--** водоснабжение

drain **–** водосток, водоотвод heating **--** отопление

to determine **–** определять copper alloy **–** медные сплавы

schedule **--** график resistance **--** сопротивляемость

installation **--** монтаж application **--** применение

foundation **--** основаниеinstallation **–** монтаж, установка

sewer **–** канализационная труба electric power **--** энергоснабжение

outer shell **–** корпус, каркас fit-out **–** отделочные работы

**II. Read and translate the text.**

 Drafting of engineering systems determines the schedule of installation works.

While the foundation is being built, the main drains must be laid to connect up to the public sewers. When the outer shell of a house is complete work can begin inside the house.

 Plumbers lay the pipes for the water supply, heating system, and drainage. Copper and copper alloys have excellent corrosion resistance and are very often used in these applications. Most of these pipes have to be hidden from the view in the finished house

 If work is done by professionals installation of engineering communications would be successfully performed. Ideally installation of water supply and sewerage systems as well as other engineering services such as gas lines, electric power supply, ventilation and air conditioning must be done simultaneously.

 Installation of engineering systems should be completed before the beginning of fit-out works, because after finishing fit-out any modifications in inner communications will be extremely complicated and even impossible.

 Similarly, the electric wires will mostly be embedded in plaster or laid under the floors. Sometimes the wires are encased in plastic tubes which are laid around the edge of the floors and window frames. The plumber and electrician also work together in installing such things as central-heating boilers.

 Gas is supplied to homes via pipes. Gas pipes must be strong enough as gas pressure in gas pipes is very high. So, alloyed steel pipes, stainless steel pipes and concrete pipes are often used in gas lines.

**III. Find the English equivalents of the following words and word combinations:** общая канализационная система, трубы, водоснабжение, система отопления, медные сплавы, отличное антикоррозийное свойство, устройства, пластиковые трубы, край, оконные рамы, сантехник, электрик, устанавливать, котёл центрального отопления, цели, давление газа, высокий, легированная сталь, нержавеющие стальные трубы, газопровод

**IV. Answer the following questions:**

1. When must the main drains be laid to connect up to the public sewers?

2. Who lays the pipes for the water supply, heating system and drainage?

3. Where will the electric wires and fittings be embedded and laid?

4. Who works together in installing such thing as central-heating boiler?

5. How is gas supplied to homes?

6. Why must gas pipes be strong enough?

7. What kinds of pipes are often used in gas lines?

**V. Retell the text given above**.

**VI. Get acquaintance with professions in construction industry.**

1. A gasman is a person who installs pipes and supplies gas to buildings.

2. A plumber is a person whose job is to fit and repair water pipes.

3. A mason is a person who builds or works with stone or brick.

4. A glazier is responsible for selecting, cutting, and installing all types of glass.

5. A plasterer is a specialist who applies plaster to walls and ceilings.

6. Roofers are skilled in repairing and installing roofs.

7. Paper hangers are persons skilled at sticking wallpaper on the walls

8. Carpenters are persons skilled at making and repairing wooden objects

9. Painters stain, varnish and apply decorative coverings to walls and ceilings.

**VII. Remember the usage of the Present Simple Tense. Open the brackets, using this grammar tense. Read and translate the following sentences from English into Russian.**

1. A lot of engineers (to work) on this project.

2. Like most people he (love) his home and his family.

3. It (to take) us half an hour to get to college.

4. She (to hate) Mathematics.

5. He (to want) to become a good specialist in gas industry.

6. I (not to like) this subject as it (to be) very difficult.

7. My friend (to live) not far from here.

**VIII. Read and translate the following sentences into Russian and make them negative.**

1. I often meet him in the college.

2. They live in the centre of the town.

3. My friend studies English.

4. She goes to the office every day.

5. I do my morning exercises every day.

**IX. Ask all kinds of questions to the following sentences.**

1. They study at a building college.

2. She speaks English very well.

**Part II**

**Gasification and Gas Supply**

**I. Read and learn the following words:**

solid **--** твёрдыйdistribution **--** распределение

liquid **--** жидкийto distinguish **--** различать

separation**-** разделениеmixture **--** смесь

invisible **--** невидимыйto supply **–** снабжать, поставлять

colourless **--** бесцветный to influence **--** влиять

fuel **–** горючее, топливоpurpose **--** цель

pipeline **--** трубопровод to deliver **--**доставлять artificial **–** искусственный enterprise **--** предприятие

consumer **--** потребительdevelopment **--** развитие

to reduce **--** сокращать extraction **–** извлечение, добыча

**II. Read and translate the text.**

Gas is one of the four fundamental states of matter; the others are solid, liquid and plasma. What distinguishes gas from liquids and solids is the vast separation of the individual gas particles. This separation usually makes gas colourless and invisible.

 Natural gas is a natural gas mixture consisting primarily of methane and some other gases. Before natural gas can be used as a fuel, it must undergo processing to remove almost all materials except methane.

 The word “gasification” has got two meanings. The first one it is the process that converts carbonaceous materials, such as coal, petroleum, or biomass into carbon monoxide and hydrogen by reacting the raw material at high temperatures with a controlled amount of oxygen. Another meaning of the word “gasification” is the installation of gas systems and gas supply of different regions of the country.

 Gas pipeline delivers gas to industrial, agricultural enterprises and ordinary consumers in various regions of our country. It creates conditions for the development of industry and agriculture, positively influences the ecology of the country.

 In much of the developed world gas is supplied to homes via pipes where it is used for many purposes such as cooking, water heating, as well as space heating. Home or other buildings heating may include boilers, furnaces, and water heaters.

 Cities and industrial enterprises are supplied with natural and artificial gases by main gas pipelines, which transport gas from the locations of its extraction to the consumers. The delivery of gas to a populated area or an industrial location takes place at a distribution control point, where gas pressure is reduced to a level permitted by the appropriate standards, and the gas is then fed into the municipal gas distribution system or to industrial enterprise.

**III. Give the English equivalents of the following words and word combinations:** газификация, газоснабжение, основные состояния материи, бесцветный и невидимый, метан, горючее, обычные потребители, экология страны, многие цели, отопление помещения, котлы, печи, водонагреватели, природный и искусственный газ, распределительный пункт, давление, снижаться, муниципальная газораспределительная система

**IV. Answer the following questions.**

1. What distinguishes gas from liquids and solids?

2. What does natural gas consist of?

3. What must be done before natural gas can be used as a fuel?

4. What purposes is gas used for?

5. What heating devices do you know?

6. Where does the delivery of gas to a populated area or an industrial location take place?

7. Where is gas pressure reduced to a level permitted by the appropriate standards?

**V. Give the main idea of the text above.**

**VI. Match the words with their definitions below. Make up sentences and translate them into Russian.**

1. plumber a) a person who manages

2. paper hanger b) a worker skilled at applying plaster

3. supervisor c) person who gives a job to others

4. contractor d) a person skilled at making and repairing wooden objects

5. employer e) a person who cuts and fits glass

6. trade worker f) a person skilled at sticking wallpaper on the walls

7. glazier g) a person who builds or works with stone or brick

8. plasterer h) a skilled worker

9. mason – i) a person or firm that promises to do work at affixed rate

10. carpenter j) a person whose job is to fit and repair water pipes

**VII. Read and translate three forms of the following irregular verbs and make up sentences.**

to be – was/were – been

to beat – beat – beaten

to become – became **--** become

to begin – began – begun

to break – broke **--** broken

to bring – brought **--** brought

to build – built **--** built

to buy – bought **--** bought

to catch – caught – caught

to choose – chose **--** chosen

**VIII. Remember the usage of the Past Simple Tense. Open the brackets and use the verbs in this grammar tense. Read and translate the following sentences into Russian.**

1. It (to take) me three hours to translate the text yesterday.

2. The secretary (to type) a letter two days ago.

3. I (to see) her in the office ten minutes ago.

4. There (to be) no snow in the streets yesterday.

5. I (to speak) to New York over telephone on Sunday.

**IX. Read and translate the following sentences into Russian. Ask all kinds of questions to the following sentences.**

1. We visited a museum on Sunday.

2. On Sunday they came home late.

**X. Translate the following sentences into English.**

1. Прошлым летом мы жили в деревне.

2. Вчера она ездила в техникум на автобусе.

3. У них не было урока истории вчера.

4. Что вы делали в воскресенье? Мы остались дома.

5. Ты шёл пешком или ехал на автобусе? – Я ехал на автобусе.

 **Part III**

**Hydraulics**

**I. Read and learn the following words and word combinations:**

applied science **–** прикладная наука flow **--** поток

application **--** применение variation **--** изменение

engineering **–** техника density **--** плотность

to involve **–** вовлекать to deal with **–** иметь отношение

property **–** свойство scope **--** масштаб

counterpart **–** аналог to extend **--** простираться

pneumatics **–** пневматика velocity **--** скорость

to concern **--** касаться control systems **–** системы управления

advance **–** продвижение, открытие channel **--** канал

**II. Read and translate the text.**

 Hydraulics is a technology and [applied science](https://en.wikipedia.org/wiki/Applied_science) using [engineering](https://en.wikipedia.org/wiki/Engineering), [chemistry](https://en.wikipedia.org/wiki/Chemistry), and other sciences involving the mechanical properties and use of [liquids](https://en.wikipedia.org/wiki/Liquid). At a very basic level, hydraulics is the liquid counterpart of [pneumatics](https://en.wikipedia.org/wiki/Pneumatics), which concerns [gases](https://en.wikipedia.org/wiki/Gas).

Hydraulics concerns with the practical applications of fluids, primarily liquids, in motion. Hydraulics deals with such matters as the flow of liquids in pipes, rivers, and channels. Some of its principles apply also to gases, usually in cases in which variations in density are relatively small. Consequently, the scope of hydraulics extends to such mechanical devices as fans and gas turbines and to pneumatic control systems.

 Liquids in motion or under [pressure](https://www.britannica.com/science/pressure) did useful work for man for many centuries before French scientist-philosopher [Pascal](https://www.britannica.com/biography/Blaise-Pascal) and Swiss physicist  [Bernoulli](https://www.britannica.com/biography/Daniel-Bernoulli) formulated the laws on which modern hydraulic-power technology is based. [Pascal’s law](https://www.britannica.com/science/Pascals-principle), formulated in about 1650, states that pressure in a liquid is transmitted equally in all directions.

 Until the 19th century it was not possible to develop velocities and pressures much greater than those provided by nature, but the invention of pumps brought a vast potential for application of the discoveries of Pascal and Bernoulli. In 1906 an important advance in hydraulic techniques was made when oil hydraulic system was installed opening the way to applications in machine tools, automobiles, machinery, ships, airplanes, and spacecraft.

**III. Give the English equivalents of the following words and word combinations:** гидравлика,технология, прикладная наука, химия, механические свойства, аналог пневматики, теоритическая основа, свойства жидкостей, практическое применение, движение, изменение плотности, следовательно, механические устройства, газовые турбины, открытие, пневматические системы управления, закон, давление, продвижение

**IV. Answer the following questions.**

1. What does hydraulics deal with?

2. What does hydraulics concern with?

3. Did liquids in motion or under [pressure](https://www.britannica.com/science/pressure) do useful work for man for many centuries?

4.What brought a vast potential for application of the discoveries of Pascal and Bernoulli?

5. What opened the way to applications in machine tools, automobiles, machinery, ships, airplanes, and spacecraft?

**V. Give the main idea of the text above.**

**VI. Write down three forms of the following irregular verbs with their translation:** to be, to beat, to become, to begin, to break, to bring, to build, to buy,

to catch, to choose

**VII. Remember the usage of the Future Simple Tense. Translate the sentences into Russian paying attention to the usage of the Present and Future Simple Tenses.**

1. If it rains, we’ll get wet.

2. He will know everything when he comes.

3. I’ll visit you as soon as I feel better.

4. It’ll take us just 10 minutes if we go there by car.

5. When I make some money I’ll buy a new car.

**VIII. Ask all kinds of questions to the following sentence.**

The performance will begin at seven o’clock in the evening.

**IX. Translate the following sentences into English.**

1. Мы поедем завтра за город, если будет хорошая погода.

2. Как только он вернётся, я вам позвоню.

3. Я буду очень рада, если снова увижу вас в Москве.

4. Если у меня завтра будет время, я буду читать.

5. Когда мы увидимся, то поговорим об этом.

**Part IV**

 **Water Supply System**

**I. Read and learn the following words and word combinations:**

storage tank – питательный резервуар ground water – грунтовые воды

average – средний tap – водопроводный кран

resident – житель by means of – с помощью

demand – потребность to transfer **--** передавать

source – источник release – выпуск, попадание

rainfall **--** осадки to degrade **--** ухудшать

to refine **--** очищать taste **--** вкус

consumption – потребление, расход purification **--** очистка

**II. Read and translate the text.**

 A water supply system is a system of engineering which provides water supply. A typical water supply system consists of water lifting installations, storage tank and filtration unit. Water is supplied to homes, factories and business. The average residential water supply demand is 380 litres per person, although it can go as high as 1900 litres per person.

 The basic source of water is rainfall which is collected in rivers and lakes, under the ground and in artificial reservoirs. Water from under the ground is called ground water and is tapped by means of wells. Most often water must be raised from a well by pumping. Water that is collected in rivers, lakes, or reservoirs is called surface water.

 The energy that the system needs to deliver the water is called pressure. That energy is transferred to the water in a number of ways: by a pump, or by compressed air. Most water is disinfected for human consumption (drinking water), but water purification may also be designed for a variety of other purposes, including the requirements of medical, pharmaceutical, chemical and industrial applications.

 As water passes through the distribution system, the water quality can degrade by chemical reactions and biological processes. Corrosion of metal pipe materials in the distribution system can cause the release of metals into the water. Release of iron from iron pipes can be the reason of “red water” in the tap. Release of copper from copper pipes can be “blue water” and metallic taste.

**III. Give the English equivalents of the following words and word combinations:** система водоснабжения, установки для поднятия воды, фильтр, основной источник воды, собирается под землёй, искусственный резервуар, поверхностные воды, энергия, давление, называется, несколько способов, сжатый воздух, питьевая вода, разнообразие, химические реакции, биологические процессы, распределительная система, качество воды

**IV. Answer the following questions.**

1. What system provides water supply?

2. What does a typical water supply system consist of?

3. How many litres per person is the average residential water supply demand?

4. What is the basic source of water?

5. What kind of water is called ground water?

6. How is ground water tapped?

7. What kind of water is called surface water?

**V. Retell the text given above.**

**VI. Read and translate three forms of the following irregular verbs and make up sentences:**

to come – came – come

to cost – cost **--** cost

to cut – cut – cut

to do – did – done

to draw – drew – drawn

to drink – drank – drunk

to drive – drove – driven

to eat – ate – eaten

to fall – fell – fallen

to feel – felt – felt

**VII. Remember the usage of the Present Progressive Tense. Read and translate the following sentences into Russian.**

1. They are watching TV now.

2. Now she is preparing a report.

3. I am listening to the music now.

4. What are you doing at the moment?

5. Now he is working in the garden.

**VIII. Ask all kinds of questions to the following sentences.**

1. They are watching TV now.

**IX. Translate the following sentences into English.**

1. Дети сейчас спят.

2. Что ты сейчас делаешь?

3. У них сейчас урок английского языка.

4. Мама сейчас разговаривает по телефону.

5. Сейчас светит солнце, но довольно прохладно.

**Part V**

**Sewerage System**

**I. Read and learn the following words:**

removal – удаление to withstand **--** выдерживать

wastes **--** отходы to bury **--** закапывать

tank – бак, цистерна grease **--** жир

property – собственность sediment **--** осадок

manufacture – производство garbage **--** мусор

process **–** процесс pollution **--** загрязнение

sanitary sewers **--** канализация leakage **--** утечка

storm sewage **–** сточные воды after-effect **--** последствие

storm sewer **–** ливневый сток rural residence **–** сельское домовладение

domestic sewage **–** бытовые сточные воды

**II. Read and translate the text.**

 Sewerage is a system for the removal of liquid wastes and rainwater. In rural residencies domestic sewage is often collected in a tank on the property. Industrial wastes, which consist of liquids produced in manufacturing processes, are sometimes collected in sanitary sewers.

 Storm sewage, which comes from rain and ground water, is collected either in a storm sewer, or with domestic sewage and industrial wastes, in what is called a combined sewer. Sewer pipe must be strong enough to withstand the structural stresses to which it is subjected by being buried in the ground.

 The storm water pollution filter is used to reducestorm water pollution. The filter removes the major portion of oil, grease, sediment, and garbage from stormy water and cleans it before it reaches the drain system and enters it. Solid pollutants, such as garbage and sediment, are collected in an internal basket of the filter. About 80 percent of the oil and grease is collected in a polymer filtration sponge. Thus, the pollution filter serves a safe installation against water pollution caused by storm after-effects.

 The pipe itself and the joints between sections of pipe must be capable of withstanding at least moderate water pressure without significant leakage of sewage into the environment. Materials used for a sewer pipe include plastics, cast iron, concrete and asbestos cement.

**III. Give the English equivalents of the following words and word combinations:** канализация,жидкие отходы,промышленныеотходы, ливневые воды, сельское домовладение, участок, производственные процессы, санитарные канализационные трубы, городские дома, учреждения, предприятия, сточные воды, грунтовые воды, комбинированная канализационная труба, достаточно прочная, среднее давление воды

**IV. Answer the following questions.**

1. What is sewerage?

2. Why must a sewer pipe be strong enough?

3. What reduces storm water pollution?

4. What does the filter do?

5. What materials are used for a sewer pipe?

**V. Write down three forms of the following irregular verbs with translation:** to come, to cost, to cut, to do, to draw, to drink, to drive, to eat, to fall, to feel

**VI.** **Remember the usage of the construction “to be going to”. Read and translate the following sentences into Russian.**

1. He is going to work at the Ministry soon.

2. They are going to meet their friends on Sunday.

3. She is going to read this book.

4. We are going to have a dictation.

5. What are you going to do tonight?

**VII. Translate the following sentences into English.**

1. Я собираюсь изучать французский язык.

2. Когда вы поговорите с вашим преподавателем?

3. Что вы будете делать вечером?

4. Я сделаю эти грамматические упражнения до урока.

5. Мы будем читать новый текст.

 **Unit Two**

**Basics of Design of Gas Distribution and Gas Consumption System**

**Part I**

**Specification of Materials for Gas Equipment.**

**Ferrous and Non-Ferrous Metals**

**I. Read and learn the following words and word combinations:**

to subject **–** подвергать hydrogen **--** водород

significant **--** значительный emulsion **--** эмульсия

reliability **–** надёжность to exist **--** существовать

requirements **--** требования exception **--** исключение

quality **–** качество common **--** общий

alloy **--** сплав property **--** свойство

corrosion-resistant **–** антикоррозийный to remain **--** оставаться

stainless **–** нержавеющий advantage **--** преимущество

impurity **–** примесь, загрязнение disadvantage **--** недостаток

to vary **--** различаться to melt **--** плавить

to pull **--** растягиватьto forge **--** ковать

**II. Read and translate the text.**

 Structures used in oil and gas industry are subject to significant mechanical, thermal and chemical influences during operation, so they have special requirements for reliability and quality. Oil and gas industry mainly uses corrosion-resistant (stainless) steels and alloys that are resistant to electrochemical and chemical corrosion (atmospheric, soil, acid, salt), etc.

 The corrosion activity of oil varies very widely. This is due to the different content of corrosive impurities and hydrogen sulfide in it. The oil may also contain water in the form of emulsion. The concentration of salts in water can reach 10 %. The risk of corrosion of equipment remains at all stages - during oil production, transportation, storage and processing. Under the influence of loads, corrosion increases, and corrosion cracking appears.

 Choosing materials for oil and gas equipment it is necessary to take into account all properties of materials, their advantages and disadvantages. As for metals, there exist twomain groups of metals: ferrous and non-ferrous.Ferrous metals are metalswhose main component is iron. As to iron, steel and their alloys, they belong to the group of ferrous metals

 The common properties of metals are hardness and high fire- resistance. That’s why they are highly used in modern construction. All metals have some common properties: they can be pulled, forged and melted. They are also good conductors of electricity. Ferrous metals are commonly used for construction of supporting members. Steel and other ferrous metals serve as reinforcement in ferro-concrete constructions.

**III. Give the English equivalents of the following words and word combinations:** нефтяное и газовое оборудование,надёжность, качество,коррозийные примеси,антикоррозийный,основные группы, чёрные и цветные металлы, основной компонент, железо, сталь, сплавы, твёрдый, огнестойкий, современное строительство, общие свойства, несущие элементы, армирование, железобетонные сооружения

**IV. Answer the following questions:**

1. What materials does oil and gas industry mainly use?

2. Why does the risk of corrosion of equipment remain at all stages?

3. What is necessary to take into account choosing materials for oil and gas equipment?

4. What metals belong to the group of ferrous metals?

5. What are the common properties of metals?

6. What metals serve as reinforcement in ferro-concrete constructions?

**V. Retell the text given above.**

**VI. Choose the correct variant and translate the sentences into Russian.**

1. Iron, steel and their alloys belong to

a) ferrous metals b) non-ferrous metals

2. One of the advantages of steel is

a) its cheapness b) its high fire- resistance

3. All metals are

a) good conductors of electricity b) poor conductors of electricity

4. Steel

a) can be pulled, forged and melted

b) can’t be pulled, forged and melted

5. Metals are divided into

a) two main groups b) three main groups

**VII. Read and translate three forms of the following irregular verbs and make up sentences:**

 to fight – fought – fought

to find – found – found

to fly – flew – flown

to forget – forgot – forgotten

to get – got – got

to give – gave – given

to go – went – gone

to grow – grew – grown

to have – had – had

to hear – heard – heard

**VIII. Remember the usage of the Past Progressive Tense. Read and translate the following sentences into Russian.**

1. I was having dinner when you rang me up.

2. Were you doing your homework all day on Sunday?

3. I was waiting for you at 10 o’clock yesterday.

4. They were having their English lesson at 10 in the morning.

5. They were smoking near the shop when we saw them.

**IX. Translate the following sentences into Russian.**

1. Вчера весь день шёл дождь.

2. Я ждала вас вчера всё утро.

3. Что вы делали вчера в 7 часов вечера?

4. Мы писали сочинение, когда прозвенел звонок.

5. Весь день в прошлое воскресенье дети играли в футбол.

**Part II**

**Concrete**

**I. Read and learn the following words.**

to consider **--** считатьquality **--** качество

universal – универсальный to form **--** формировать

concrete slab – бетонная плита tensile – растяжимый, вязкий

aggregate – заполнитель (бетона) to crush **--** дробить

coarse – крупный, необработанный accordingly **--** соответственно

fine – тонкий, мелкозернистый the very – именно тот, тот самый

decay **–** разрушение, разложение production **--** производство

to pour – наливать, насыпать hard **--** твёрдый

to produce **--** производить to harden **--** твердеть

**II. Read and translate the text.**

 Concrete is a synthetic stone, which can be formed while soft into practically any shape the builder wants. Concrete is considered to be a universal material for construction. Different kinds of concrete can be used practically for every building purpose. The main property that makes concrete so popular that it can be formed into strong monolithic slabs. Another good quality is its relatively low cost. Besides, concrete is known to be fire**-**and**-**decay resistant.

 Concrete is produced by combining coarse and fine aggregates, Portland cement, and water. Coarse aggregate is generally gravel or crushed stone, and fine aggregate is sand. Cement, sand, gravel, and water are taken in proportional amounts and mixed.

 The quality of concrete depends mostly on the quality of the cement used. The process of production consists in pouring the mixed components into forms and holding them until they harden. The process of hardening generally lasts for about 28 days.

 Concrete, as any building material, has not only advantages but also disadvantages. Its main disadvantage is that it has no form of its own. It doesn’t possess useful tensile strength. Because of these qualities, in modern construction concrete is very frequently combined with different metals.

 The introduction of metal into the structure of concrete is highly advantageous. It strengthens the material and helps to realize its limitless construction and architectural potential.

**III. Give the English equivalents of the following words and word combinations using the text below:** универсальный материал, считается, главное свойство, прочные монолитные плиты, относительно низкая цена, огнестойкий, стойкий к гниению, пропорциональное количество, из-за, качество, смешивать, смешанные компоненты, производство, обычно, обладать, неограниченный потенциал

**IV. Answer the following questions.**

1. Is concrete a universal material for construction?

2. What is the main property that makes concrete so popular?

3. Concrete is fire-and-decay resistant, isn’t it?

4. What two types of aggregates are used for producing concrete?

5. What ingredients are necessary for production of concrete?

6. What does the quality of concrete depend on?

7. How long does the process of hardening last?

**V. Retell the text given above.**

**VI. Choose the correct variant.**

1. Concrete is considered to be

a) a universally used material

b) a frequently (часто) used material

2. The main property of concrete is

a) its relatively low cost

b) that it can be formed into monolithic slabs

3. Concrete is known to be

a) fire-resistant b) fire**-**and decay**-**resistant

4. Concrete is produced

a) by combining coarse and fine aggregates

b) by combining coarse and fine aggregates, Portland cement and water.

5. Concrete is frequently combined

a) with steel and iron b) with copper

**VII. Write down three forms of the following irregular verbs with translation:** to fight, to find, to fly, to forget, to get, to give, to go, to grow, to have, to hear

**VIII. Remember the usage of the Future Progressive Tense. Read and translate the following sentences in the Future Progressive Tense into Russian.**

1. He will be waiting for you at seven in the evening.

2. They will be having dinner at that time.

3. We’ll be discussing this question tomorrow morning.

4. I’ll be seeing the engineers tomorrow afternoon.

5. What will you be doing tomorrow evening?

**IX. Ask all kinds of questions to the following sentence.**

I will be waiting for you at seven in the evening.

**Part III**

**Types and Properties of Concrete**

**I. Read and learn the following word combinations.**

architectural concrete – архитектурный

asphalt concrete – асфальтобетон precast с. **--** заранее отлитый

gas concrete – газобетон plain с. – неармированный б.

gypsum concrete – гипсовый prestressed reinforced с. –

gravel concrete **--** бетон из гравия напряжённо армированный б.

high-strength c. – высокопрочный lightweight c. – лёгкий б.

waterproof c. – водонепроницаемый cast-in-site c. – монолитный б.

nailable c. – пробиваемый гвоздями б. poor quality c. – б. низкого качества

**II. Read and translate the text.**

 The quality of concrete is known to depend on the properties of materials it consists of. The amount of constructing materials is also of great importance. There are many different types of concrete. Among the kinds of concrete used in modern construction there are plain concrete and reinforced, or ferro**-**concrete. The usage of plain concrete is practically limitless. As to ferro-concrete, it is mostly used for construction of foundations, columns, girders and beams. This kind of concrete is also rather popular for constructing bridges, dams and dock walls.

 The main good qualities of prestressed concrete are its high strength and durability. The combination of steel and concrete is highly advantageous and serves the purpose of producing a compressed stress in the concrete as a building material. For this reason any member of beam is under constant compression and as a result has no cracks.

 Reinforced concrete is a combination of two of the strongest structural materials, concrete and steel. This term is applied to a construction in which steel bars or heavy steel mesh are properly embedded in concrete. Concrete is poured around and over steel mesh. When the concrete hardens, the material gains great strength.

Concrete being a universally used material, its new kinds are being constantly produced. Among others there exists concrete with cells. Its main quality is that it is made up of materials that emit gas and foam during the process of mixing the aggregates with water.

 It should be taken into account that concrete of this type possesses relatively light weight. It is mostly used for producing slabs, wall panels and frame constructions. As we know, decrease in weight leads to a considerable decrease in strength. This quality is classified as a great disadvantage of cellular concrete.

**III. Give the English equivalents of the following words and word combinations:** свойства материалов, большое значение, среди, железобетон, использование, безгранично, фундамент, колонны, балки, весьма популярен, дамбы, стены доков, универсальный, производить, существовать, качество, процесс смешивания, заполнитель, следует принимать во внимание, обладать, лёгкий вес, плиты, уменьшение, качество, классифицируется

**IV. Answer the following questions.**

1. What does the quality of concrete depend on?

2. What is ferro-concrete mostly used for?

3. What kind of concrete is popular for constructing bridges, dams and dock walls?

4. What is the main quality of concrete with cells?

5. What is this kind of concrete used for?

**V. Retell the text given above.**

**VI. Read and translate three forms of the following irregular verbs and make up sentences:**

to hide – hid – hidden

to hold – held – held

to hurt – hurt – hurt

to know – knew – known

to lead – led – led

to leave – left – left

to let – let – let

to lie – lay – lain

to loose – lost – lost

to make – made – made

**VII. Translate the following sentences in the Future Progressive Tense from Russian into English.**

1.Что вы будете делать завтра в 8 часов вечера?

2. Завтра в 8 часов вечера я буду играть на пианино.

3. Когда ты придёшь ко мне, я буду работать в саду.

4. В воскресенье весь день мы будем гулять в парке.

5. Завтра весь день будет идти дождь.

 **Part IV**

**Composite Materials**

**I. Read and learn the following words:**

significantly **--** значительно to embed **--** вделывать

chemical **--** химический to compare **--** сравнивать

property **--** свойство common **–** общий, обычный

ceramic **–** керамический example **--**пример

fibre **--** волокно unique **--** уникальный

fiberglass **--** стекловолокно to prefer **--**предпочитать

matrix – матрица resin **--** смола

shower stall **–** душевая кабина fabricating **--** производство

packaging **--** упаковка

**II. Read and translate the text.**

 Composite materials are materials made from two or more materials with significantly different physical or chemical properties, that when combined, produce a material with characteristics different from the individual components.

 Polymer composites are materials in which the matrix polymer is reinforced with organic/inorganic fillers of a definite size and shape. The most widely used type of composite material is polymer matrix composites (PMCs). PMCs consist of fibres made of a ceramic material such as carbon or glass embedded in a plastic matrix.

 Polymer composites usually have unique mechanical and physical properties because they combine the best properties of different materials. The new material may be preferred for many reasons: common examples include materials which are stronger, lighter or less expensive when compared to traditional materials.

 Many commercially produced composites use a polymer matrix material often called a resin solution. There are many different polymers available depending upon the starting raw ingredients. There are several broad categories, each with numerous variations. The most common are known as polyester, vinyl, phenolic, polyamide, polypropylene, and others.

Composite materials are generally used for buildings, bridges, structures, swimming pool panels, race car bodies, shower stalls, bathtubs, storage tanks and others. These materials find a wide number of applications in such diverse fields as geotextiles, building, electronics, medicine, packaging, and automobiles. Fabricating composite materials is a complex process. However, new manufacturing techniques are developed.

**III. Give the English equivalents of the following words and word combinations:** композитные материалы, различные физические и химические свойства, полимерные матричные композиты, вделанный, составляют 60% объёма, органические и неорганические наполнители, углерод, уникальные механические свойства, предпочитать, менее дорогой, различные вариации, применение, геотекстильные материалы

**IV. Answer the following questions.**

1. What are composite materials made from?

2. Composite materials have many advantages, don’t they?

3. What are the advantages of composite materials?

4. In what countries are composite materials widely used?

5. Are these materials used for buildings?

6. Where do composite materials find a wide number of applications?

**V. Make up a dialogue according to the questions.**

**VI. Retell the text given before.**

**VII. Write down three forms of the following irregular verbs:** to hide, to hold, to hurt, to know, to lead, to leave, to let, to lie, to loose, to make

**VIII. Remember the usage of the Present Perfect Tense. Translate the following sentences into Russian.**

1. He has built a fence around the house.

2. Mother has washed the curtains today.

3. My friend has left our town.

4. We have already been there.

5. I’ve just spoken to him.

**IX. Translate the following sentences from Russian into English.**

1. Я забыла закрыть окно.

2. Он ещё не сделал уроки.

3. Я никогда об этом не слышал.

4. В этом месяце я прочитал три книги.

5. Вы когда-нибудь были в Лондоне?

**Part V**

**Plastics**

**I. Read and learn the following words:**

prefabrication – сборка field – поле, область

decade – десятилетие varnish **--** лак

fumes – пары, испарения sticky – липкий, клейкий

chemical – химический glue **--** клей

flexible **--** гибкий contemporary **--** современный

insulator **--** изолятор to maintain **--** содержать

original**--** первоначальный substance **--** вещество

versatility **--** универсальность clip **--** скрепка

**II. Read and translate the text.**

Plastics arematerials that are widely used in modern construction for prefabrication. Plastics are non**-**metallic, synthetic, carbon-based materials. The plastics that were unknown only a few decades ago have become extremely important and widely used for construction purposes.

 Plastic is a material consisting of a wide range of synthetic or semi-synthetic organics that can be formed into solid objects of diverse shapes. Plastics are typically organic polymers of high molecular mass, but they often contain other substances. Plasticity is the general property of all materials that are able to deform without breaking.

 Due to their relatively low cost, ease of manufacture, versatility, plastics are used in an enormous and expanding range of products, from paper clips to spaceships. They have already displaced many traditional materials, such as wood, stone, horn and bone, leather, paper, metal, glass, and ceramic.

 The plastics being used nowadays possess many advantages. First of all they are extremely light and their tensile strength is greater than that of many metals. Besides, they are weather-resistant and resistant to attacks by industrial fumes and to a great number of chemical substances. Thermoplastic is used when strength and durability is important.

Polyurethane is one of many different polymers. It is a flexible and durable manufactured material that can take the place of rubber, metal or wood in thousands of applications across practically all fields. It can be hard like fibre glass, protective like varnish, sticky like glue. Since its invention during 1940s, polyurethane has been used in a wide range of items from baby toys to airplane wings, and it continued to be adapted for contemporary technology.

**III. Give the English equivalents of the following words and word combinations:** армированный бетон, широко используется, современное строительство, чрезвычайно важный, строительные цели, обладает, лёгкий, гибкость, устойчив к погоде, промышленные испарения, промышленные материалы, заменить, тысячи применений, стеклянное волокно, защитный, крылья самолётов, химическое вещество, жидкость, пена, твёрдое вещество

**IV. Answer the following questions.**

1. Are plastics widely used for construction purposes nowadays?

2. What are the advantages of plastics?

3. What material can be hard like fibre glass, protective like varnish and sticky like glue?

4. When was polyurethane invented?

5. What can be made from polyurethane?

**V. Retell the text given before.**

**VI. Read and translate three forms of the following irregular verbs and make up sentences:**

to mean – meant – meant

to meet – met – met

to put – put – put

to read – read – read

to ride – rode – ridden

to ring – rang – rang

to rise – rose – risen

to run – ran – run

to say – said – said

to see – saw – seen

**VII. Remember the usage of the Past Perfect Tense. Read and translate the following sentences from English into Russian.**

1. My friend had left London by the time I got there.

2. I didn’t ring them up before I had finished the work.

3. They had read two English books by the end of the month.

4. I had already done my homework when my parents came home.

5. The meeting had already begun when we came to the place.

**VIII. Translate the following sentences into English using the Past Perfect Tense.**

1. Когда мы вошли, фильм уже начался.

2. Как только кончился дождь, мы пошли на реку.

3. Как только дети позавтракали, они пошли в школу.

4. Когда я пришёл в техникум, занятия уже начались.

5. Я вышел из дома и вспомнил, что оставил телефон на столе.

**IX. Ask all kinds of questions to the following sentence.**

As soon as we got to the theatre, the performance had already begun.

 **Part VI**

**Structure and Main Elements of Gas** **Distribution System.**

 **I. Read and learn the following words and word combinations:**

distribution **--** распределение pressure control point **–** пункт регулир**.** давления

to intend **--** предназначатьas well as **--** также

supply **--** поставкаboiler room **--** котельная

source **–** источник consumption **--** потребление

consumer **--** потребитель external **–** наружный

to perform **--** выполнять inlet gas pipeline **–** внутренний газопровод

storage station **--** хранилище residential buildings **–** жилые здания

to serve **–** служить household buildings **–** бытовые здания

pipeline **--** трубопроводgascontrol unit **–** газорегуляторная установка

outlet **--** выходfilling gas station **–** газонаполнительнаястанция

**II. Read and translate the text.**

 Gas distribution system is a complex consisting of technological and economically interrelated objects intended for transportation and supply of gas from its sources to gas consumption objects. Gas distribution is the activity of storing and transporting gas from its source directly to the consumer.

 Gas sources are the elements of the gas supply system that serve to supply gas to the gas distribution network. They can be: main gas pipelines and outlets from them and underground gas storage stations.

 At the outlet of the gas source, a gas pressure control point is located, the role of which, as a rule, is performed by a gas distribution station. Consumers of gas are: industrial production, household and administrative buildings, boiler rooms, public and residential buildings.

 Gas distribution system consists of a network of gas distribution and gas consumption. The gas distribution network is a system of external gas pipelines, as well as technical devices: gas control units, gas filling stations, gas equipment.

 External gas pipelines are underground, above-ground, or underwater pipelines laid outside the buildings. Internal gas pipelines are gas pipelines laid from the inlet gas pipeline to the connection points located inside the buildings.

**III. Give the English equivalents of the following words and word combinations:** распределение, потребление, поставка, газорегуляторная установка, газонаполнительнаястанция, источник, потребление, потребитель, связанные между собой объекты, пункт регулирования давления, трубопровод, жилые здания, бытовые здания, технические приборы, транспортировка, газовое оборудование

**IV. Answer the following questions.**

1. What are gas sources?

2. Where is a gas pressure control point located?

3. What are consumers of gas?

4. What does gas distribution system consist of?

5. What is the gas distribution network?

**V. Retell the text given before.**

**VI. Choose the correct variant and translate the sentences into Russian.**

1. Composite materials

a) are often used in construction

b) are seldom used in construction

2. Polyurethane

a) can take the place of rubber, metal or wood

b) can’t take the place of rubber, metal or wood

3. Polyurethane

a) resists moisture and heat

b) doesn’t resist moisture and heat

4. Plastics

a) are weather resistant

b) are not weather resistant

5. Plastics

a) possess many advantages

b) possess many disadvantages

**VII. Write down three forms of the following irregular verbs and translate them into Russian:** to mean, to meet, to put, to read, to ride, to ring, to rise, to run, to say, to see

**VIII. Remember the usage of pronouns and adverbs “much, many, little, few”. Read and translate the following sentences into Russian.**

1. They work too much.

2. Say little and do much.

3. Does your friend read much?

4. I know many poems by heart.

5. How many English words do you know?

**IX. Translate the following sentences from Russian into English.**

1. Моя сестра много работает.

2. Они читают много английских книг.

3. Многие студенты знают два иностранных языка.

4. Не читайте слишком много вечером.

5. Мы посылаем письма многим иностранным фирмам

 **Unit Three**

**Organization and Execution Work on Construction and Installation of Gas Distribution and Gas Consumption Systems**

 **Part I**

**Preparatory Work before Installation of Gas Distribution**

**Systems and Gas Consumption**

**I. Read and learn the following words and word combinations:**

pipe **--** труба trench **--** траншея

to install – устанавливать homogenous **--** однородный

installer – монтажник backfill **--** заполнитель

to ensure **--** обеспечивать bottom **--** дно

virgin soil – нетронутая почва ground water – грунтовые воды

to provide **--** обеспечивать myriad **--** множество

dumping location – мусорная свалка debris **--** обломки

decomposition **--** разложение to surround **--** окружать

acidic level – уровень кислотности application – применение

**II. Read and translate the text.**

 It is very important for installers of piping systems to ensure that the trenches they provide do not become the dumping location for wood scraps, insulation and a myriad of different kinds of construction debris. The decomposition of the soil surrounding the tube can greatly increase the acidic level of the soil. It is recommended that copper tubing must be installed so that it will be surrounded by a homogenous backfill. Copper and copper alloys have excellent corrosion resistance and are very often used in these applications.

 Laying the tube on the bottom of a trench, directly on the virgin soil, will lead to corrosion in this area. Types of backfill materials that may be used are: washed sand, small smooth river stones, or washed pea gravel. Four to six inches of a homogenous backfill material spread evenly along the bottom of the excavated trench will provide and improve the drainage of groundwater from the trench.

 Underground pipelines for various purposes such as gas and water supply, heating, electricity and communication cables in urban construction often have to be installed under the road and railway, tramway, city streets and squares, and structures using trenchless (closed) laying methods. In cities horizontal mechanical drilling is widely used.

**III. Give the English equivalents of the following words and word combinations:**

трубопровод, мусорная свалка, изоляционный материал, разложение, увеличить кислотный уровень, рекомендуется, однородный заполнитель, медный трубопровод, медные сплавы, отличное антикоррозийное свойство, применения, гладкие речные камешки, мелкий гравий, дюймы, вырытая траншея, улучшит, различные цели, электричество, коммуникационные кабели, городское строительство, горизонтальное механическое бурение.

**IV. Answer the following questions.**

1. What is very important for installers of piping systems?

2. What can greatly increase the acidic level of the soil surrounding the tube?

3. What kind of metals has excellent corrosion resistance?

4. What will lead to corrosion when laying the pipe?

5. What types of backfill material do you know?

6. What will provide and improve the drainage of ground water from the trench?

**7.** When is horizontal drilling method used?

**V. Read and translate three forms of the following irregular verbs and make up sentences:**

to sell – sold – sold

to send – sent – sent

to shake – shook – shaken

to shine – shone – shone

to shoot – shot – shot

to show – showed – shown

to shut – shut – shut

to sit – sat – sat

to speak – spoke – spoken

to spend – spent – spent

**VI. Remember the usage of indefinite pronouns “some, any, no, every” and their derivatives. Read and translate the following sentences into Russian.**

1. Some children do not like milk.

2. Have you got any friends here?

3. You may come at any time.

4. Have you got any chalk?

5. Please give me some chalk.

**VII. Choose the necessary word given in brackets. Read and translate the sentences.**

1. Do you learn (some, any) foreign languages?

2. Has your friend got (some, any) English magazines?

3. I didn’t get (some, any) letters yesterday.

4. Please take (some, any) English book you like.

5. I don’t think we’ve got (some, any) time today to discuss this question.

**VIII. Read and translate the following sentences into Russian.**

1. There is somebody in the room.

2. There is nobody in the garden.

3. There is something on the table.

4. There is nothing on the floor.

5. Someone is waiting for you.

**IX. Translate the following sentences into English using necessary indefinite pronouns. Do it in a written form.**

1. Я ничего здесь не вижу.

2. Расскажите нам что-нибудь интересное.

3. Вас кто-то ждёт в вашей комнате.

4. В моём рассказе есть что-нибудь смешное?

5. Сейчас слишком поздно что-нибудь делать.

**Part II**

**Gas Pipeline Laying Methods**

**I. Read and learn the following words and word combinations:**

supporting structure **–** опорное сооружениеpriorto the start **–** до начала

combustible **–** горючий, воспламеняемый to carry out **--** выполнять

height **--** высота to remove **--** удалять

with the availability **–** при наличии fertile **--** плодородный

destruction **--** разрушение temporary **--** временный

surface **--** поверхность coating **–** покрытие

layer **–** слой drainage **--** водоотведение

pedestrian crossing **–** пешеходный переход drainage facilities **–** очистные сооружения

**II. Read and translate the text.**

 Gas distribution pipelines are laid under the ground (or water), on the ground and above the ground (water). Underground pipeline (gas pipeline) is laid in the area of cities and villages. In places of large concentrations of people – inside large residential complexes – pipes are laid above ground.

 Above-ground gas pipelines are laid on supporting structures made of non-combustible materials. At above-ground placement in rather crowded places the height of placement of the pipeline shall be more than 2,2 m, and with the availability of motor transport – more than 5 m.

 The main methods of underground laying of pipelines are trench and trenchless. Both methods have a number of advantages and disadvantages. Trench laying of pipelines is a traditional method of laying pipelines with the destruction of the surface layer of the earth or asphalt coating.

 Prior to the start of the main installation and construction works, the following

preparatory works should be carried out: to remove the fertile layer of land; to build temporary roads, pedestrian crossings, drainage and drainage facilities.

 Trenchless pipe laying provides work without destroying the surface layer of the earth. The most common method of closed laying is drilling. Drilling is carried out from the surface of the earth; the diameter of the well should be 30-50% larger than the diameter of the pipe.

**III. Give the English equivalents of the following words and word combinations:** газораспределительные трубопроводы, опорное сооружение**,** невоспламеняемые материалы, главные методы, подземная прокладка трубопровода, главный монтаж, строительные работы, несколько преимуществ и недостатков, поверхностный слой, асфальтовое покрытие, бестраншейная укладка труб, повреждение, диаметр

**IV. Answer the following questions.**

1. Where are gas distribution pipelines laid?

2. What structures are above-ground gas pipelines laid on?

3. What main methods of underground laying of pipelines do you know?

4. What preparatory works should be carried out prior to the start of the main installation and construction works?

5. What is the most common method of closed laying?

**V. Retell the text given before.**

**VI. Write down three forms of the following irregular verbs and translate them into Russian:** to sell, to send, to shake, to shine, to shoot, to show, to shut, to sit, to speak, to spend

**VII. Remember the usage of the modal verbs “can” and “may”. Read and translate the following sentences into Russian.**

1. Can you speak English?

2. They can come at five o’clock.

3. We couldn’t speak English last year.

4. Could you open the window, please?

5. Can I speak to you before or after classes?

6. May I speak to you now? – Yes, of course, you may.

7. It may snow towards evening.

**VIII. Translate the following sentences into English** **in a written form**.

1. Кто может перевести это предложение?

2. Не могли бы вы мне помочь?

3. Я не могу остаться здесь сегодня.

4. Вы сможете обсудить эти вопросы завтра.

5. Никто не смог выполнить это упражнение.

**Part III**

**Pipelines of Gas Distribution System. Steel Pipes**

**I. Read and learn the following words and word combinations:**

seamless pipe **–** бесшовная труба to extend **--** продлевать

welded pipe **–** сварная труба service life **–** срок службы

rolling **–** прокаткаsolid **--** сплошной

application **--** применениеspecificity **--** специфика

forming **--** формовка tightness **--** герметичность

electric welding **--** электросварк**а** complexity **--** сложность

galvanized pipe **--** оцинкованная трубаflexibility **--** гибкость

thermal conductivity **–** теплопроводностьzinc **--** цинк

**II. Read and translate the text.**

 There are different kinds of pipes which are used for different purposes. Among them there are gas pipes, water supply pipes, sewer pipes, and some others.

So, they are produced from different materials.

 In gas distribution systems pipes made of steel and polyethylene are often used. Steel pipes are classified according to the method of production and the type of pipe surface. According to the method of production pipes are produced in two types: seamless and welded.

 Seamless pipe is produced by rolling with the help of special equipment. Welded pipes are more often used in this application. They are produced from sheet metal by forming and electric welding.

 The type of surface of the pipe is divided into galvanized and non-galvanized. Solid zinc coating is applied both from the outer and inner side of the pipe. Galvanizing is carried out in order to extend the service life, increase corrosion resistance and increase strength.

 The only disadvantage of galvanized steel pipes is the narrow specificity of their application. Most often they are used in the laying of gas networks in residential and industrial buildings. Before being sold to consumers, the pipes must be tested by hydraulic pressure at the factory.

 Advantages of steel pipes: strength and tightness. Disadvantages: significant weight, complexity of installation, limited flexibility, tendency to corrosion and high thermal conductivity, leading to the formation of condensate due to which internal corrosion progresses.

**III. Give the English equivalents of the following words and word combinations:** различные виды труб, разные цели, среди, водопроводные трубы, канализационные трубы, метод производства, поверхность трубы, бесшовные трубы, сварные трубы, прокатка, электросварка, специфика, срок службы, гибкость, теплопроводность, оцинкованная труба, герметичность, формовка, применение, образование конденсата

**IV. Answer the following questions.**

1. What kinds of pipes do you know?

2. What kinds of pipes are often used in gas distribution systems?

3. What kind of pipes are produced according to the method of production?

4. What is carried out in order to extend the service life, increase corrosion resistance and increase strength?

5. What are advantages and disadvantages of steel pipes?

**V. Make up a dialogue according to the questions.**

**VI. Retell the text given above.**

**VII. Remember the usage of the modal verb “must” and its equivalent “to have to, to have got to”. Read and translate the following sentences into Russian.**

1. All children must go to school.

2. She must do it at once.

3. You mustn’t go out.

4. I’ve got to go now.

5. Did you have to get up early?

6. He has to read this book.

**VIII. Translate the following sentences into English** **in a written form**.

1. Мы должны писать диктант сегодня?

2. Вам пришлось остаться дома, потому что была плохая погода?

3. Я не люблю поздно ложиться спать, но иногда мне приходится.

4. Тебе не нужно идти в библиотеку, у нас много книг дома.

5. Почему вы не можете ответить на мой вопрос?

**IX. Read and translate three forms of the following irregular verbs and make up sentences:**

to stand – stood – stood

to steal – stole – stolen

to take – took – taken

to teach – taught – taught

to tell – told – told

to think – thought – thought

to throw – threw – thrown

to wake – woke – woken

to win – won – won

to write – wrote – written

to understand – understood – understood

**Part IV**

 **Polyethylene Pipes**

**I. Read and learn the following words and word combinations:**

low pressure **–** низкое давлениеfatigue **--** усталость

high density **–** высокая плотностьto allow **--** разрешать

smooth **--** гладкий to prohibit **--** запрещать

coupling **--** муфта due to **–** из-за

welding **--** сваркаtensile **--** растяжение

ability **–** способностьdepth **--** глубина

feature **--** особенностьto reduce **--** сокращать

exposure **--** воздействиеsignificantly **--** значительно

margin of safety **–** запас прочности

**II. Read and translate the text.**

One of the most popular materials used for gas pipes is polypropylene fibre. It was found out that when being mixed with soil the fibres produce the necessary stability. The plastics that were unknown only a few decades ago have become extremely important and widely used for construction purposes. The plastics being used nowadays possess many advantages. First of all they are extremely light and their tensile strength is greater than that of many metals. Besides, they are weather-resistant and resistant to the action of industrial fumes and to a great number of chemical substances.

Polyethylene pipes today are the most commonly used than steel. Polyethylene gas pipes are made of high density polyethylene. Pipes must have a smooth outer and inner surface. The pipes are connected by couplings or welding. After connecting the pipes they are tested at the factory.

 A specific feature of polyethylene pipes is the ability to deform over time under the influence of loads. This process is called fatigue.

 Only underground laying of polyethylene pipes is allowed. Ground and underground polyethylene pipes are prohibited due to the fact that the properties of polyethylene degrade with prolonged exposure to ultraviolet radiation, which significantly reduces the life of the pipe. Depth of laying of polyethylene pipes shall be not less than 1 meter.

 Advantages of polyethylene pipes: large margin of safety, guaranteed service life of 50 years, corrosion resistance, low weight per running meter, low hydraulic resistance, low cost.

**III. Give the English equivalents of the following words and word combinations:** полипропиленовое волокно, крайне важный, промышленные пары, химические вещества, прочность на растяжение, гладкая внутренняя и наружная поверхность, специфическая особенность, влияние нагрузок, ультрафиолетовое излучение, значительно, большое преимущество, воздействие, запрещать, сокращать, запас прочности

**IV. Answer the following questions.**

1. What isone of the most popular materials for production of gas pipes?

2. What advantages do polyethylene gas pipes possess?

3. Are polyethylene gas pipes weather-resistant and resistant to the action of industrial fumes and to a great number of chemical substances?

4. What is a specific feature of polyethylene pipes?

5. What method of laying of polyethylene pipes is only allowed?

**V. Remember the usage of the modal verbs “should” and “ought to”. Read and translate the following sentences into Russian.**

1. He ought to do this task at once.

2. You should show your notes to the teacher.

3. She should be more attentive at the lessons.

4. You should get up earlier and prepare breakfast.

5. They should visit her more often.

**VI. Write down three forms of the following irregular verbs and translate them into Russian:** to stand, to steal, to take, to teach, to tell, to think, to throw, to wake, to win, to write, to understand.

**VII. Finish the following sentences and translate them into Russian.**

1. They are students, … ?

2. They study at our college, …?

3. You like this weather, …?

4. He is your best friend, …?

5. She studies at the Institute, …?

6. They sent a letter yesterday, …?

7. There will be a nice film on TV tonight, …?

8. Yesterday they went to the concert, …?

9. You can speak English very well, ..?

**VIII. Translate the following sentences into English.**

1. Ты учишься или работаешь?

2. Когда ты обычно встаёшь?

3. Он не знает значения этого слова.

4. Она учится в нашем техникуме, не так ли?

5. Взрослые и дети любят играть в компьютерные игры

**Unit Four**

**Organization, Conduct and Control of the Operation**

**of Gas Distribution and Gas Consumption Systems**

 **Part I**

**Acceptance into Operation** **of Gas Pipelines and Gas Equipment**

**I. Read and learn the following words and word combinations:**

acceptance **--** приёмкаresponsible **--** ответственный

operation **--** эксплуатацияmaintenance **--** обслуживание

in accordance with– в соответствииtoinclude **--** включать

customer **--** заказчикrepair **--** ремонт

owner **--**владелецchimney **--** дымоход

convenient **--** удобныйduct **--** канал

scheme **--** схемаwater heater **--** водонагреватель

safety **--** безопасностьto attach **--** прикреплять

requirement **--** требованиеto draw up **--** оформлять

**II. Read and translate the text.**

 Acceptance into operation of gas pipelines and gas equipment is carried out in accordance with the safety Rules in the gas industry. The customer or the owner of the gas pipelines and gas equipment, accepted by the commission before gas start-up, should:

 - place in a convenient place the scheme of gas pipelines and gas equipment safety instructions, including fire safety requirements;

 - prepare responsible persons and personnel for maintenance and repair of gas pipelines and gas equipment;

 - inspect chimneys, ventilation ducts and ventilation devices.

 Acceptance consists of three main stages: external inspection of the installed gas network, gas distribution tests, gas start-up. Thus: stoves should be based on a straight floor surface; water heaters should be strongly attached to walls; walls in case of need should have protective thermal insulation.

 Prior to gas start-up on the accepted network and devices the documents signed by the customer, the contractor and the receiver are drawn up. The following minimum of documentation is established, without which the operating organization has no right to start up gas:

 - the project and related documentation;

 - the act of commissioning of the gas network and equipment inside the building;

 - the act on the suitability for use of chimneys.

**III. Give the English equivalents of the following words and word combinations:** ввод в эксплуатацию, газовое оборудование, комиссия, ответственные лица, удобное место, схема, инструкции, в соответствии, обслуживание, до пуска газа, подключение газа, дымоходы, вентиляционные каналы, водонагреватели, ремонт газопровода, подписывать, заказчик, владелец, прикреплять, оформлять

**IV. Answer the following questions.**

1.What should the customer or the owner of the gas pipelines and gas equipment do before gas start-up?

2. How manystages does acceptance consists of?

3.Where shouldgas stoves be based on?

4. What should be drawn up prior to gas start-up on the accepted network?

5.What minimum of documentation is established, without which the operating organization has no right to start up gas?

**V. Retell the text given above.**

**VI. Ask all kinds of questions to the following sentence.**

Acceptance into operation of gas pipelines consists of three main stages.

**VII. Translate the following sentences into English.**

1. Детям не следует себя вести подобным образом.

2. Студентам следует посещать все занятия.

3. Тебе следует приходить на занятия вовремя.

4. Ему следует лучше готовиться к занятиям.

5. Вам не следует пользоваться на занятиях телефонами.

**VIII. Write down the plural form of these nouns:** a university, a thief, a day, a party, a name, a kitten, a goose, a mouse, a child, a man, a book, a toy, a baby, a family, a tooth, an eye, an ear, a house, a sheep, a ship, a bench, a woman, a deer, a play, a pen, a fruit, a city, a glass, a potato, a tomato, a hero, money, a company, an ox, a sky, a story, a leaf, a way

 **Part II**

**Maintenance of Gas Pipelines**

**I. Read and learn the following words and word combinations:**

technical condition **--** valve **–** вентиль, кран, клапан

lubrication **--** смазка measurement **--** измерение

adjustment **--** установка monitoring **--** контроль

operability **--** работоспособность bypass route **–** обход, объезд

serviceability **--** надёжность locksmith **--** слесарь

protection **--** защита check **--** проверка

elimination **--** устранение contamination **--** загрязнение

minor **--** незначительный well **--** колодец

faults **–** неполадки, неисправности detection **–** выявление, обнаружение

basement **--** подвал leak **--** утечка

**II. Read and translate the text.**

 All types of works on maintenance of gas pipelines shall be performed according to safety rules of systems of gas distribution and gas consumption, rules of technical operation and requirements of safety of work in gas economy.

 At maintenance of gas pipelines very important operations are carried out:

- control of technical condition;

-cleaning, lubrication, adjustment and other operations to support the operability and serviceability of gas pipelines and structures on them.

 The maintenance includes the following works:

- monitoring of the condition of external gas pipelines, including means of electrical protection, as well as the elimination of minor faults arising in the course of operation;

- inspection of valves installed on the gas pipeline;

- measurement of gas pressure in gas pipelines.

 Monitoring of the condition of external gas pipelines should be carried out by systematic bypass of the gas pipeline routes. Bypassing the routes of underground gas pipelines should be carried out by a team of locksmiths for servicing gas pipelines. The following works are performed during the bypass of gas pipelines:

- systematic check for gas contamination of wells, basements, underground structures, detection of gas leaks by external signs;

- monitoring of road and construction works carried out near the gas pipeline route.

**III. Give the English equivalents of the following words and word combinations:** обслуживание газового трубопровода, правила безопасности, требования безопасности, газораспределение и потребление, технические работы, технические условия, смазка, установка, работоспособность, надёжность, устранение, незначительные неисправности, измерение, контроль, загрязнение, обнаружение

**IV. Answer the following questions.**

1. What operations are carried out at maintenance of gas pipelines?

2.What works does the maintenance include?

3. What should be carried out by systematic bypass of the gas pipeline routes?

4.Why is it very important to inspect valves installed on the gas pipeline?

5.Is it necessary tomeasure gas pressure in gas pipes?

**V. Remember the usage of the modal verb “shall”. Read and translate the following sentences into Russian.**

1. Shall I clean the blackboard?

2. Shall I read and translate the text?

3. Shall I water the flowers?

4. Shall we write this exercise?

5. Shall we come to college tomorrow?

**VI. Remember the formation of degrees of comparison of adjectives. Use the correct forms of the adjectives given in brackets and translate the sentences into Russian.**

1. Going by train is (cheap) than going by plane.

2. Who is (interesting) person in your group?

3. My English is as (good) as his.

4. He is (intelligent) person I know.

5. Which is (large) country in the world?

**VII. Read and translate the following sentences with the construction “there is, there are” into Russian.**

1. There is a TV set in the room.

2. The book is on the table.

3. There are flowers in the garden.

4. The flowers are in the vase.

5. There are many words in this sentence.

**VIII. Translate the following sentences into English.**

1. Посередине комнаты – стол.

2. В нашем городе есть красивый парк.

3. В Москве много красивых зданий.

4. В нашем классе одно окно.

5. В саду много цветов.

**IX. Translate the following sentences in the Imperative Mood from Russian into English.**

1. Прочитайте и переведите этот текст.

2. Не разговаривайте!

3. Не кладите сумку на стол, пожалуйста.

4. Задайте пять вопросов к тексту.

5. Подойти к доске, пожалуйста.

6. Приходи на занятия вовремя.

7. Не опаздывайте на занятия!

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