СОВРЕМЕННЫЙ ГОРОД

Пособие по английскому языку

Издание второе, переработанное и дополненное

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30 к.

Пособие ставит своей целью привить студентам навыки чтения и понимания оригинальной литературы по строительству на английском языке. Тексты пособия обладают информативностью, отражают современные достижения в области строительства.

Во 2-м издании (1-е — 1978 г.) частично обновлен текстовой материал, увеличено количество упражнений.

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СОДЕРЖАНИЕ

ПРЕДИСЛОВИЕ

Данное учебное пособие предназначается для студентов II—III курсов строительных и архитектурных вузов.

Основная его цель состоит в том, чтобы в соответствии с требованиями программы по иностранным языкам подготовить студентов к самостоятельному чтению оригинальной литературы по специальности на английском языке. Тематика текстов соответствует основным специальностям факультетов в строительных вузах и по своему характеру позволяет обеспечивать общим заданием всех студентов таких вузов. Тексты, включенные в пособие, являются оригинальными, взятыми из английских и американских книг, журналов и газет; лишь некоторые из них подвергнуты минимальной обработке, продиктованной методическими соображениями.

Лингвистический анализ показал, что лексический состав пособия, как по своему содержанию, так и по структуре, соответствует современному состоянию английского языка научно-технического функционального стиля. Повторяемость наиболее употребительных слов и терминов (от 10 до 100 и более) способствует их активному усвоению.

Учитывая, что студенты изучали грамматику в школе и в соответствии с программой МВ и ССО повторяют ее на первых двух семестрах института, в пособии обращается внимание лишь на аспекты, характерные для научно-технической литературы: страдательный залог, обороты с неличными глагольными формами, многоэлементные определения, структура предложения и др.

Пособие состоит из 8 разделов, которые охватывают по содержанию следующие темы: планировка города; здание и его части; строительные материалы, строительные машины; отопление и вентиляция, водоснабжение и канализация; источники энергии; гидротехнические сооружения; архитектура.

Пособие содержит 12 основных текстов (А) (по 2,5—3 тыс. печатных знаков), к каждому из которых дается дополнительный текст (В) (по 2,5 тыс. печатных знаков), на 70—80% построенный на материале основного текста. Основной текст имеет 3—4 предтекстовых упражнения и 15—17 послетекстовых упражнений. Дополнительный текст снабжен 6—8-ю упражнениями. Текстовой материал пособия составляет в целом около 110 тыс. печатных знаков и рассчитан (с учетом норм, предусмотренных программой) на проработку в течение 3-х семестров. В зависимости от учебных планов конкретного вуза пособие может быть рекомендовано на 3—5-м, либо 4—6-м семестрах.

В настоящем 2-м издании книги частично обновлен текстовой материал с учетом его познавательной ценности и актуальности. Принимая во внимание развитие методики обучения иностранному языку и ориентацию на взаимосвязанное обучение различным видам речевой деятельности, введены 2 приложения — «Приложение I», состоящее из текстов, предназначенных для развития навыка аудирования, и «Приложение II», задания в котором предназначаются для контроля навыка чтения и выполняются студентами в аудитории без предварительной подготовки после завершения работы над соответствующим разделом. Внесены изменения в некоторые упражнения с целью усиления в них элементов проблемного обучения и повышения мотивации (например, упражнения на выборочное извлечение информации, на анализ и обобщение информации; на установление логических связей — восстановить целое по отдельным частям, прокомментировать план-конспект, выдвинуть аргу-

менты, подтверждающие данную мысль; на аранжировку контрастирующих характеристик; включены также задания игрового характера, предполагающие элементы соревнования — "Memory tests", — составление наибольшего числа словосочетаний с заданными словами, опровержение неправильных утверждений наиболее убедительными аргументами и др.). Введен англо-русский словарь.

Авторы выражают благодарность кафедре английского языка Томского инженерно-строительного института за тщательное рецензирование рукописи.

МЕТОДИЧЕСКИЕ РЕКОМЕНДАЦИИ

Методические принципы построения пособия определялись конкретными задачами, вытекающими из его основной цели — научить читать иностранный текст по специальности с непосредственным пониманием читаемого, т. е. не прибегая к его анализу и переводу. Доминирующая роль в пособии отводится развитию умений и навыков различных подвидов чтения: ознакомительному чтению с охватом содержания на 70%, просмотровому и поисковому чтению, а также чтению с использованием словаря.

Учитывая общий объем пособия, задача развития навыков устной речи решается в пособии лишь частично, в плане профессиональной направленности речи, что обусловлено тематикой текстов.

В соответствии с поставленными целями упражнения построены и расположены так, чтобы научить студентов самостоятельно работать с иностранным текстом, обеспечить извлечение заключенной в тексте информации с постепенным (от упражнения к упражнению) ее уточнением и детализацией. С этой целью предусматриваются упражнения, развивающие умение выделять основные мысли, положения, факты и группировать их по принципу общности; упражнения на конкретизацию основной информации; упражнения на тематические обобщения, подводящие к умению аннотировать и реферировать текст; лексические и словообразовательные упражнения, развивающие языковую догадку; упражнения по технике перевода для уточнения понимания читаемого. В целом в пособии используются более 20 видов упражнений.

По своему характеру и по форме ряд упражнений построен по принципам тестов с опорой на контекстуальную догадку и с использованием элемента подсказки (т. е. не столько тренирующие упражнения, сколько обучающие, стимулирующие логическое мышление). Используются различные способы сигнализации понимания читаемого. Применительно к различным видам упражнений широко используются известные формы заданий тестов: выбор правильного — неправильного варианта, сочетаемость, расположение в заданной последовательности и множественный выбор. По наполнению упражнения (на 95%) построены на предложениях, взятых из текстов, и выполнение их является по существу многократным чтением текста с конкретно поставленной в каждом случае новой задачей. К каждому тексту предусматриваются также упражнения, имеющие целью развитие умения дать мотивированный ответ (опровергните данное утверждение, ответьте на данный вопрос ограниченным количеством предложений и др.).

Для обеспечения соответствующего ритма работы и выполнения методических задач, обозначенных в пособии, необходимо четкое понимание конкретных целей каждого вида упражнений, поэтому формулировки заданий даны на русском языке и в ряде упражнений регламентировано время их выполнения.

Предтекстовые упражнения включают лексические упражнения (на слова с интернациональными корнями, лексический и терминологический минимум) и задание на нацеленное чтение. Они выполняются непосредственно перед первичным просмотровым чтением текста и предназначены для создания опоры для понимания его основной идеи. Этим объясняется то, что в них, например, вводятся только те английские слова с интернациональными корнями, которые могут быть сопоставлены с соответствующими русскими словами, имеющими то же значение.

Первичное ускоренное чтение текста (про себя) проводится в аудитории перед тем, как текст задается для проработки на дом, а проверка понимания его ограничивается выполнением упражнения на нацеленное чтение.

Послетекстовые лексические упражнения, во-первых, имеют своей целью помочь уточнить понимание текста при дальнейшей работе над ним (поэтому, например, в упражнения на слова с интернациональными корнями включаются такие слова, объем значений которых в английском и русском языках расходится) и, во-вторых, носят обучающий характер, способствующий накоплению переводческого опыта и расширению потенциального словаря студента. Форма записи этих упражнений имеет несколько вариантов. Для быстроты выполнения и проверки упражнений на сочетаемость в них введена нумерация.

При выполнении упражнений на понимание логического стержня текста (например упр. 2, с. 9) и на конкретизацию информации (упр. 3, с. 9) необходимо проанализировать, почему сделан именно данный выбор и почему неприемлемы остальные варианты на основе постоянного сопоставления с текстом. Эти упражнения завершаются *резюмирующим* упражнением, которое имеет целью обобщение основного содержания текста; рекомендуется выполнять его на русском языке.

К каждому тексту даны 4—6 упражнений, предназначаемых для развития умений и навыков аналитического чтения и некоторых умений и навыков по технике перевода. Эти упражнения касаются лексико-грамматических трудностей, присущих языку английской и американской научно-технической литературы (упражнения на структуру английского предложения, многозначность слов, грамматические явления).

Следует отметить, что авторы считают необходимым ограничивать пользование переводом (как средством уточнения и проверки понимания) рамками, предусмотренными в заданиях упражнений.

Перед выполнением упражнений *на развитие навыков устной речи* необходимо проводить резюмирующее чтение текста (про себя).

С заданиями к текстам на аудирование студенты знакомятся до прослушивания самого текста, который дан отдельно от основной части (см. «Приложение I») и зачитывается преподавателем. При проверке выполнения задания преподаватель повторно читает текст.

Цель и характер упражнений на словообразование, письменный перевод и ускоренное чтение ясны из самих формулировок заданий.

Упражнения к дополнительным текстам по своему характеру совпадают с упражнениями основных текстов, но ограничиваются только целями развития навыка чтения с общим охватом содержания.

Учитывая основную цель пособия, чтению вслух отводится ограниченное место. Рекомендуется проводить тренировку на чтение вслух при выполнении части упражнений и при переводе указанных абзацев.

Для удобства выполнения некоторых упражнений в пособии введена нумерация абзацев текстов. В упражнениях номер абзаца дается в скобках после интересующего нас слова.

Авторы

РАЗДЕЛ I

TOWN PLANNING AND TOWN DEVELOPMENT

I — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

activity, master, individual, to absorb, distance, functional, central, part, traditional, social, industrial, topography, position, cultural, active, circulation, public, diagram, structure, communications, interest, to reconstruct, to adapt, control, natural, zone, to fix, organic, to modify

2. Вспомните значения следующих английских слов и подберите к ним соответствующий перевод из правого столбца.

description	1. полный
purpose	2. основной
freedom	3. свобода
development	4. изменять
to exist	5. движение
society	6. развитие; расширение
recent	7. окружать
needs	8. нужды
to accept	9. описание
to define	10. цель
to connect	11. определять
complete	12. создание
movement	13. осуществлять
to change	14. приспособлять(ся)
main	15. общество
to adapt	16. соединять
creation	17. принимать
to surround	18. недавний

3. Прочтите и запомните значения следующих слов для лучшего понимания текста.

development застройка
environment окружающая среда, окрестность; *зд.* окружающая местность
design проектировать
dwelling жилой дом
pollution загрязнение
survey обследование

forecast прогноз
master plan генеральный план застройки
flexible гибкий
congestion перенаселенность, скопление
pattern образец
suburbs пригород, окрестности; *зд.* районы
housing жилищное строительство
recreation отдых
define определять

4. Прочтите текст. Укажите, в каких абзацах дается определение понятию «генеральный план».

Text. Town Planning

(1) That cities should have a plan is now admitted in our time of large-scale construction and plan-making has become an everyday activity. The purpose of a town plan is to give the greatest possible freedom to the individual. It does this by controlling development in such a way that it will take place in the interests of the whole population.

(2) The new development absorbs or modifies an existing environment, and so before it can be designed it is necessary to find out about that environment. It is also necessary to do research of the trends of population growth, the distance from work to home, the preferences for different types of dwelling, the amount of sunshine in rooms, the degree of atmospheric pollution and so on. After the survey is complete a forecast of future development is made in the form of a map, or series of maps: the master plan or development plan. As no one can be certain when the development is to 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 extend and renew its dwellings, reconstruct its working places, complete its communications and avoid congestion in every part.

(3) The plan is never a complete and fixed thing, but rather one that is continually being adapted to the changing needs of the community for whom it is designed. Until quite recent years town plans were always made as inflexible patterns, but history has shown that a plan of this description inevitably breaks down in time.

(4) The flexible plan, preceded by a survey, is one of the most revolutionary ideas that man has ever had about the control of his environment.

(5) Most towns today have a characteristic functional pattern as follows: a central core containing the principal shopping centre, business zones, surrounded by suburbs of

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

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

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какие из данных предложений выражают главную мысль текста. (Время — 5 мин.)

1. In the preparation of the master plan it is necessary to define the town zones. 2. All cities should have a plan. 3. Before a flexible plan is made it is necessary to find out about the existing environment. 4. The master plan also defines places for active and passive recreation.

2. Укажите, к каким абзацам текста могут служить заголовками данные предложения. Расположите их согласно последовательности изложения.

1. Features of the traditional town pattern.
2. The purpose of a master plan.
3. The purpose of a town plan.
4. What main points should be included in a survey?

3. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. The purpose of a town plan is...

a) to do research of the trends of population growth; b) to give the greatest possible freedom to the individual; c) to find out about the existing environment.

2. Before a town plan is designed, it is necessary...

a) to renew and extend the dwellings, reconstruct the working places; b) to make a forecast of future development in the form of a map or a series of maps; c) to find out about the existing environment.

3. History has shown that a town plan should be flexible, because...

a) it should continually be adapted to the changing needs of the community for whom it is designed; b) it defines the

position of schools, shopping centres and business centres; c) it suggests the routes of public transport.

4. The master plan has to define the ultimate growth of the town and...

a) no one can be certain when the development is to take place; b) a society is an organic thing with life and movement. c) therefore it is the structure upon which all future development is to take place.

5. In the preparation of a master plan the planners are preoccupied with...

a) the idea that in our time plan-making has become an everyday activity; b) the definition of the town pattern and the laying down of a pattern of main roads; c) the necessity to determine the distance from work to home.

4. Составьте план к тексту из пяти пунктов.

5. Сверяясь с текстом, подберите нужное значение для выделенных слов в данных сочетаниях и переведите их.

1. large-**scale** construction (1) — шкала; масштаб; размер;
2. **everyday** activity (1) — ежедневный; повседневный; обычный;
3. in such a **way** (1) — дорога; средство; способ; путь;
4. **development** plan (2) — развитие; усовершенствование; застройка;
5. **master** plan (2) — главный; ведущий; руководящий; генеральный;
6. **most** towns (5) — больше всего; самый; наибольший; большинство;
7. **through** traffic (5) — через; из-за; сквозной; беспрепятственный;
8. town **pattern** (5) — образец; характер; тип; структура;
9. to **lay down** the pattern (5) — уложить; составить; установить

6. Вспомнив, какие русские слова имеют те же корни, что и английские слова, подберите к ним эквиваленты из правого столбца.

Образец: activity (активность) — деятельность

to absorb	1. схема
diagram 1	2. общественный
social 2	3. закреплять
to modify	4. расположение
industrial 5	5. промышленный
central 6	6. главный (центральный)
position 3, 4	7. общественный

traditional	8. естественный
natural	9. обычный
public	10. предшествовать
to fix	11. поглощать
	12. видоизменять
	13. гибкий

7. Переведите следующие словосочетания.

business zone, town pattern, population growth, development plan, road system, plan-making, town planner, housing area, shopping centre, business centre, public transport, recreation area

8. Переведите предложения, обращая внимание на выделенные слова.

1. Cities should have a flexible **plan.** 2. **Plan**-making has become a much exercised activity. 3. People should **plan** the future development of the town. 4. Most town **planners** accept the traditional town pattern. 5. A town **designer** should not ignore the past. 6. **Designing** does not mean imitation of the past. 7. When making the **design** of a town we should bear in mind future development. 8. Before a town is **designed** it is necessary to find out about the environment.

9. Определите, в каких предложениях since употреблено в качестве союза и переводится «так как».

1. Since a society is an organic thing, the plan of a city must be flexible. 2. The plan is continually being adapted since it is never a complete thing. 3. The town has changed greatly since I saw it last, that is since 1970. 4. Before a plan is designed it is necessary to find out about the existing environment since a plan absorbs or modifies it. 5. Since the master plan takes into consideration the existing topography, it indicates the areas for rest. 6. The master plan is very much like a diagram since it is never a complete and fixed thing.

10. Найдите предложения, где слово one употребляется во избежание повторения существительного. Переведите их.

1. The plan of a city must be flexible, as no one can be certain when the development will take place. 2. A plan is never a complete and fixed thing, but rather one that is continually being adapted to the changing needs of the society. 3. One should know that a good plan is the one that forecasts the future development. 4. One should use a new plan based on a survey, and not an old one. 5. A flexible plan, based on a survey, is one of the most revolutionary ideas. 6. The practice of making flexible plans is essentially a progressive one.

11. Переведите предложения, обращая внимание на значение глагола to be.

1. The purpose of a town plan is to give the greatest possible freedom to the individual. 2. The master plan is the structure upon which all future development is to take place. 3. Another purpose of a town plan is to show the principal road system connecting the various zones together. 4. We are to take into consideration all the advantages and disadvantages to decide what plan is the best. 5. This master plan is to be completed in the short period of two years. 6. Many new blocks of houses are to be built according to the new development plan. 7. The task of an architect is to make plans, whereas the task of an engineer is to build according to those plans.

12. Переведите 2-й абзац текста.

13. Укажите, какие из 3-х предложений (a, b, c) являются ответами на данные вопросы.

1. Why is it necessary to make a survey of the existing environment?

a) It is because no one is certain when the development is to take place. b) It is because the new development absorbs or modifies the environment. c) It is because growth is a law of life.

2. What does a survey consist in?

a) It consists in completing the town's communications. b) It consists in finding out about the environment, in research into the trends of population growth and the types of dwellings; and into atmospheric pollution as well. c) It consists in defining a place for recreation.

14. Опровергните следующие неправильные утверждения с точки зрения содержания текста.

Образец: Most town planners suggest quite new town patterns.
No, they don't. Most town planners do not suggest quite new town patterns. As the text says, most town planners accept the traditional town pattern.

1. The purpose of a plan is to limit the active life of its population. 2. The plan is a complete and fixed thing, since the needs of the community do not change. 3. Growth is a law of life and town growth should not be controlled by any plan.

15. На основе содержания текста начертите план-схему новой застройки. Прокомментируйте его на английском языке.

16. Переведите письменно со словарем. (Время — 25 мин.)

Far or Near

In choosing a location for the satellite towns now being planned in the USSR preference is given to the southern and south-eastern slopes of hills with big green belts and reservoirs in the vicinity. A necessary condition in making the choice is the availability of convenient means of communication with the city best of all being an electrified railway line and a good automobile highway.

The distance of the satellite town from the city depends upon how well developed the electrified railway and the highway systems are. In the case of Moscow, which has highly ramified networks running in all directions, it is possible to locate the satellite cities within 46 to 50 km., whereas in the case of Gorky, for example, the sensible thing apparently is to place them nearer.

It is taken into consideration that even when there are some enterprises and offices of its own in the satellite town, a certain portion of the population may still work in the city; thus Soviet architects are of the opinion that the town and city should not be more than an hour's commuting distance apart.

I — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. а) Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

standards, economy, to examine, scheme, details, scene, form, aesthetically, architect, historical, effect, tradition, visual, vandalism, texture, atmosphere, primitive, mechanical, expansion, to ignore, concentration, balance, natural, amorphous, imitation, problem, urban, date, adequate, position

б) К каким из вышеприведенных слов русскими эквивалентами являются слова.

изучать, план (проект), сосредоточенность, равновесие, естественный, воздействие (влияние), расширение, подробности, зрительный (наглядный), нормы, экономичность

2. Вспомните значения следующих английских слов и подберите к ним соответствующий перевод из правого столбца.

to design	1. предлагать
dwelling	2. расширение, застройка
building	3. проектировать
through	4. сквозь
to suggest	5. рассмотреть
development	6. жилой дом
to construct	7. возможный
growth	8. здание
environment	9. удовлетворяющий, приятный
to remember	10. окружающая среда
to consider	11. изучать
to examine	12. строить
possible	13. существовать
satisfying	14. помнить
population	15. рост
to exist	16. разрушать
to demolish	17. население
to site	18. соответствующий, должный
to provide	19. располагать
proper	20. обеспечивать

3. Прочтите текст и определите, какие основные вопросы освещаются в нём.

Text. Design of the Complete Town

(1) In considering the design of a town or city we must always remember that the town must be sited in a healthy position, free from dust, fogs, its layout must not encourage winds through urban spaces, and it must not pollute its own atmosphere. It must provide proper standards of space and sunlight to its buildings and open spaces, and it must be possible to move about the town easily and without danger to life. Its parts must be so arranged that it is a convenient place for dwelling, working and playing.

(2) Connected with these and many other technical problems is the problem of economy. The problem must be thoroughly examined which does not suggest that the cheapest scheme may be the best.

(3) The town must work properly but it should also give pleasure to those who look at it. When we say that a town should be beautiful, we do not mean that it should have some fine parks and noble buildings, we mean that the whole of the environment, down to the most insignificant detail, should be beautiful.

(4) If we examine a typical urban scene we see all kinds of objects like buildings, lamp posts, pavings, posters, and trees. It is all of them, together with all the other kinds of objects that are found in the town, that are called the raw materials of a town design. Each of them down to the least important should be aesthetically satisfying.

(5) Designing in terms of past time does not imply the imitation of the existing environment but respect of the form, colour, texture, and general qualities of the existing development. That which is being constructed is for immediate use which is not to suggest that there must be an attempt to ignore the past and be "modern".

(6) Future time must also be thought of in terms of the estimated life of the objects. Objects like buildings and lamp posts grow old and become out-of-date, and the designer must select those materials that are adequate for their life, no more and no less.

(7) Until comparatively recent times the growth of cities has been without purpose in any sense. Cities must grow, for growth is a law of life. But this natural overgrowth should have aroused action to restore balance. Mere size, as such, is no index of greatness.

(8) All overgrowth means overcrowding, which is loss of space, one of the vital needs of cities. The lesson that has to be learned is that natural growth, and all the other forms of growth have to be made subject to will and intelligence, or the city must be harmed. This is a certain lesson of history.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какие из данных предложений не соответствуют содержанию текста.

1. When building a town we should be very careful not to spoil what exists already. 2. The streets and buildings of existing towns will serve many future generations. 3. When designing a town we should not forget that its citizens should be able to move about it without any danger to their life. 4. The economics of a town plan and the technical problems are closely connected. 5. Scientific forecast also includes progressive methods of planning. 6. The designer should select the best building materials for the objects of his planned town. 7. Cities will grow but their growth must be controlled.

2. Расположите следующие пункты плана в последовательности, соответствующей содержанию текста.

1. The whole town, and even its details, should be beautiful.

2. A town should be a nice place to live, to work and to rest in.

3. The town designer should remember that his raw materials will exist in the future.

4. All the objects in the town are called the raw materials of town design.

5. City growth should be controlled.

3. Закончите данные предложения с учетом содер

1. Before a development plan is made, it is necessary... 2. The plan of a city has to be flexible because... . 3. The traditional town pattern is as follows:...

РАЗДЕЛ II

BUILDINGS AND THEIR FUNCTIONS

II — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова. Используйте их для понимания текста.

factor, to classify, functions, modern, technology, political, architect, proportion, concrete, techniques

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

building industry строительная промышленность
managerial staff управленческий аппарат
industrial construction промышленное строительство
housing жилищное строительство
technological advance технический прогресс
off-site prefabrication фабричное изготовление
site planning планирование работ на строительной площадке
prefabricated structures сборные конструкции
present-day design современное проектирование
kitchen and sanitary fittings санитарное оборудование
food-processing plant пищекомбинат

office buildings служебные здания

storage facilities складские помещения

3. Прочтите текст. Укажите, какие абзацы текста раскрывают содержание заголовка "Residential and Industrial Buildings".

Text. Residential and Industrial Buildings

(1) In technically developed countries the building industry, comprising skilled and unskilled workers in many trades, building engineers and architects, managerial staff and designers, employs a considerable proportion of the available labour force.

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

(3) Housing is prominent among the factors affecting the level of living. The improvement of the housing represents a concrete and visible rise in the general level of living. In many countries residential construction has constituted at least 12 per cent and frequently more than 25 per cent of all capital formation. Since in the USSR home building industry is the concern of the state the research and development in housing technology is carried out on a national scale and is being paid much attention to.

(4) The ever growing housing demands have brought to life new methods of construction with great emphasis upon standardization, new levels of technological advance utilizing such techniques as off-site prefabrication, precasting, use of reinforced concrete panels and large-scale site planning. At present, prefabricated structures and precast elements may be classified into two principal groups—for residential houses and industrial buildings.

(5) Present-day designs for residential construction envisage all modern amenities for a dwelling, they advocate larger, better built and better equipped flats and houses. There is a marked improvement in the heating and ventilating systems as well as in hot-water supply, kitchen and sanitary fittings. Many tenants now can afford better furnishings, refrigerators, washing machines, etc. A house which is a physical environment where a family develops is acquiring a new and modern look.

(6) Industrial buildings comprise another significant type of construction. This type of construction involves factories, laboratories, food-processing plants, mines, office buildings, stores, garages, hangars and other storage facilities, exhibition halls, etc.

(7) Each of these functions demands its own structural solution and techniques. But in general they may be divided into two classes according to whether the plan must give greater attention to the size and movement of machinery or of persons. The building techniques (by techniques we mean building materials and methods) depend upon the types of buildings.

(8) Modern industrial buildings have demonstrated the advantages of reinforced concrete arches, metal frames, glass walls and prefabricated standardized mass produced parts. Steel was gradually substituted for iron and permitted wider rooms and larger windows. Windows can be enlarged to the extent that they constitute a large fraction of the wall area.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какое из данных предложений выражает главную мысль текста. (Время — 8 мин.)

1. In the USSR home building industry is the concern of the state. 2. The building industry comprises skilled and unskilled workers in many trades. 3. Building industry which includes residential, public and industrial construction is being carried out on a large scale and it has brought into being new methods and techniques. 4. There is a marked improvement in the heating and ventilating systems as well as in hot-water supply.

2. Укажите, в каких абзацах раскрывается содержание следующих заголовков. Расположите их согласно последовательности изложения.

1. The functions of industrial buildings.
2. New methods of housing.
3. Present-day design for residential construction.
4. The advantages of reinforced concrete for modern industrial buildings.
5. Building industry and national economy.

3. Укажите, какие из данных предложений относятся к описанию жилых зданий и какие — к промышленным. Сгруппируйте предложения по этим темам.

1. In many countries residential construction has constituted at least 12 per cent of all capital formation. 2. The problem of housing has grown into a major, political issue in most countries. 3. Industrial buildings comprise another significant type of construction. 4. Modern buildings have demonstrated the advantages of reinforced concrete arches, metal frames, glass walls. 5. The differing functions of industrial buildings require their own structural solutions and techniques. 6. Present-day designs for housing envisage all modern conveniences and sanitary fittings. 7. Buildings may be divided into two classes according to whether the plan must give greater attention to the size and movement of machinery or of persons. 8. Windows can be enlarged to the extent that they constitute a large fraction of the wall area. 9. A house which is a physical environment where a family develops is acquiring a new and modern look.

4. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. Modern industrial buildings have demonstrated the advantages of...

a) hot-water supply and panel heating; b) reinforced concrete arches, metal frames, glass walls and prefabricated parts; c) all modern conveniences for a dwelling.

2. Industrial type of construction involves...

a) better built and better equipped flats and houses; b) theatres, cinemas, museums, libraries, etc.; c) factories, food-processing plants, mines, office buildings, stores, etc.

3. Present-day designs for residential construction envisage...

a) movement of machinery and persons; b) application of metal frames and glass walls; c) all modern conveniences including hot-water supply and panel heating.

5. Дополните незаконченные предложения необходимыми по смыслу аргументами.

1. Housing construction has grown into a political issue because...

2. In the USSR the research and development in housing technology is carried out on a national scale since...

3. A house is acquiring a new and modern look for...

4. The building techniques depend upon the types of buildings because...

Определите по формальным признакам границы групп подлежащего и сказуемого; переведите предложения.

1. In the USSR much attention is being paid to research and development in housing technology. 2. Housing is prominent among the factors affecting the level of living. 3. The advantages of reinforced concrete arches have been demonstrated by modern industrial buildings. 4. Each of these functions demands its own structural solution. 5. At present prefabricated structures and precast elements may be classified into two principal groups.

7. Переведите предложения на русский язык, обращая внимание на сказуемое.

1. House-building is being carried out on a large scale in the USSR. 2. The level of living is very much affected by housing. 3. New methods of construction have been brought into being by the ever growing housing demands. 4. The size and shape of building is greatly affected by the general plan for the framing of an industrial structure. 5. Some hundreds of systems of prefabrication have been devised and many of them have been tried, with greater or lesser success. 6. Medium life houses could be best produced by prefabrication methods. 7. In prefabricated construction the units should be based on a common dimension. 8. Mass production is encouraged by standard sizes and qualities of building units.

8. Выберите из данного внизу списка нужное сказуемое для каждого предложения.

1. Building materials by the type and the function of a building. 2. The techniques of construction ... not only by the availability of materials but also by the total technological development of society. 3. A number of factories ... to manufacture standardized factory-made elements. 4. The built-in space of an apartment as well. 5. Windows ... for the best possible lighting and ventilation. 6. Research and development in housing on a national scale. 7. Modern industrial buildings ... the advantages of prefabricated reinforced parts. 8. Reinforced-concrete elements in residential house construction.

1. have been designed; 2. are governed; 3. are influenced; 4. are made use of; 5. are provided; 6. are carried out; 7. can be said to have demonstrated; 8. should be carefully thought of

9. Вставьте данные внизу слова в соответствии с их функцией в предложении.

1. Building industry a considerable ... in the national economy. 2. Each of these its own structural solution.

3. Industrial another significant type of construction.

place, holds, demands, functions, comprise, buildings

10. Сгруппируйте слова с одним и тем же корнем; определите, какой частью речи является каждое из них. Переведите их.

manager, consideration, availability, residence, industry, managerial, residential, available, considerable, political, physics, vision, technological, structure, politics, physical, visible, technology, structural, industrial

11. К каждой данной паре слов подберите русское слово с тем же корнем, что и английское. Сравните объем их значений.

Образец: proportion — доля (пропорция)

1. techniques — (методы) (...). 2. modern — современный (...). 3. utilize — использовать (...). 4. residential — жилищный (...). 5. technology — техника (...).

12. Переведите 3, 4, 5-й абзацы текста.

13. Опровергните следующие неправильные с точки зрения содержания текста утверждения не менее чем двумя-тремя высказываниями каждое.

Образец: Housing does not affect the level of living. This statement is incorrect. Housing affects the level of living. The improvement of housing shows a concrete and visible rise in the general level of living.

1. Not much attention is paid to the problems of construction. 2. Modern residential houses and industrial buildings are mostly built of bricks and timber. 3. Modern industrial buildings have demonstrated the advantages of plastics and ceramics.

14. Дайте не менее трех вариантов ответа на каждый вопрос.

1. Why is a house acquiring a new and modern look? 2. What have ever growing housing demands brought into being?

15. Прочтите тексты A и B за 8 мин. и отметьте, какие из перечисленных проблем рассматриваются в них.

1. New building materials for earthquake-proof structures.

2. Methods of constructing earthquake-proof structures.

3. The role of prediction of earthquake threats.

4. Methods of evacuating the inhabitants in case of an earthquake.

5. Some practical experience in constructing earthquake-proof structures.

A. In April 1976 a series of earthquakes occurred in the Soviet Central Asia the first of which was near Gazli virtually raising the town. Yet Tashkent, about 500 km from the epicentre of the earthquake which reached 7.3 on the Richter scale, suffered actually no damage at all. The reason was that Tashkent had been rebuilt following a devastating earthquake in 1966 to standards which would be able to withstand similar events in the future. Soviet engineers predicted the recent earthquake and as a result the inhabitants of Gazli were evacuated saving many lives. Therefore the most effective response to earthquake threats at the moment seems to be prediction coupled with precautions.

B. Architects, planners, designers and builders of Soviet Kasakhstan work together at a specialized scientific research institute to perfect earthquake-proof buildings. The capital of Kasakhstan Alma-Ata has suffered more than 4,000 earth tremors in the last century. Using a new kind of prefab ferroconcrete frame and new methods of fastening parts, and pretesting elements and structures for resistance builders have erected a number of buildings of late which can stand a magnitude of nine earthquakes.

16. Прослушав текст, прочитанный преподавателем, подберите правильные ответы на следующие вопросы.

1. What is said about the rent in the USSR?

a) The rent in the USSR is very low as compared to other countries. b) The rent has not changed since 1950. c) The rent in the USSR is a great revolution from the point of view of the well-being of the people.

2. What new type of technology is being used?

a) Standardized factory-made elements are widely used. b) New methods of construction demonstrate the advantages of prefabricated reinforced parts. c) Nowadays various building materials can be tested in climate chambers that can imitate tropical rain, arctic frosts and extreme heat.

II — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

variety, general, residential, techniques, factors, to classify, function, portion, exterior, texture, apartment, interior, thermal, tent, to stimulate, visually, evolution, total

2. Вспомните значения следующих английских слов и подберите к ним соответствующий перевод из правого столбца.

building materials	1. технический прогресс
techniques	2. современный
residential construction	3. обеспечивать
technological changes	4. теплоизоляция
mechanized operations	5. методы строительства
site	6. железобетонные блоки
reinforced concrete blocks	7. жилищное строительство
construction methods	8. методы
thermal insulation	9. строительные материалы
to provide	10. механизированные операции
contemporary	
technological advance	11. строительная площадка
	12. изменения в технологическом процессе

3. Сгруппируйте синонимы.

domestic	1. dining rooms
houses	2. modern
to influence	3. considerably
technological development	4. dwellings
factory-made elements	5. to affect
to lead to	6. to result in
to carefully think of	7. prefabricated units
contemporary	8. technological advance
dining areas	9. to consider
greatly	10. residential

T e x t. Types of Buildings

(1) Types of buildings depend upon social functions and may be classified according to the role in the community. The types of buildings may be domestic, educational, office, industrial, recreational, etc. The common and necessary conditions are: (a) its suitability to use by human beings in general and its adaptability to particular human activities; (b) the stability and permanence of its construction.

(2) Speaking of residential construction we must say that the apartment houses are mostly built to suit urban conditions. Group housing provides home for many families and is at once public and private. The techniques of construction or the methods by which structures are formed from particular materials are influenced not only by the availability and charac-

ter of materials but also by the total technological development of society.

(3) The evolution of techniques is conditioned by two factors: one is economic—the search for a maximum of stability and durability in building with a minimum of materials, labour and time; the other is expressive—the desire to produce meaningful form.

(4) Large housing programmes have tended to stimulate technological change in the building industry. Modular design (i.e. design in which the elements are dimensioned in combinations of a fixed unit) has led to standardization of elements, interchangeability of parts and increased possibilities for mass production, with resultant economies. Entire apartment assemblages are available and are being used to an increasing extent. These techniques aim at a higher output of better structures at lower cost.

(5) The high degree of mechanization and standardization is successfully achieved by reinforced concrete blocks and units. Reinforced concrete homes are produced by a variety of construction methods. Various methods of constructing reinforced concrete houses involve extensive use of large sections manufactured in heavily mechanized factories and erected at the site.

(6) The built-in space of an apartment should be carefully thought of as well. There is a considerable trend toward built-in furniture. Rooms should be both efficient and visually satisfying. The extent of built-in cabinets must be determined. Drawers and shelves can often be concealed behind walls, freeing valuable floor space.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Прочтите текст. Определите, заголовком к какой части текста могут служить данные предложения.

1. The total technological development of society influences the techniques of residential construction.

2. The interior of a modern residential building.

3. Technological changes and new techniques in the building industry.

2. Укажите, какие из данных предложений выражают главную мысль текста. (Время — 5 мин.)

1. Great technological advances in plumbing and ventilating systems. 2. The types of walls of concrete structures. 3. The types of exterior concrete surface. 4. Classification of

buildings according to their functions, building techniques and factors affecting the latter.

3. Дополните незаконченные предложения необходимыми по смыслу аргументами.

1. Types of buildings depend upon social factors because...
2. Large housing programmes have tended to stimulate technological change in the building industry because...
3. Entire apartment assemblages are used to an increasing extent since...
4. There is a considerable trend toward built-in furniture because...

4. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. Various methods of constructing reinforced concrete houses involve...

a) craft operations at the building site; b) building materials, labour and time; c) extensive use of large sections manufactured in heavily mechanized factories.

2. Types of buildings depend upon...

a) the availability and character of materials; b) increased possibilities for mass production; c) social functions in the society.

3. The high degree of mechanization and standardization is successfully achieved by...

a) reinforced concrete blocks and units; b) technological change in the building industry; c) craft operations at the building site.

РАЗДЕЛ III

BUILDING MATERIALS, BUILDING TECHNIQUES AND BUILDER'S PLANT

III — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

designer, to select, to adapt, material, construction, effective, result, civil, physical, uniform, microstructure, gypsum, cement, chemical, reaction, to accompany, evolution,

to modify, variety, slag, structural, inert, fundamental, object, production, selection, accurate, method, variation

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

lime известь
gypsum гипс
masonry каменная *или* кирпичная кладка
high alumina cement цемент с высоким содержанием глинозема
high rate of strength высокая прочность
resistance to crushed stone прочность на щебень
mortar раствор
aggregate заполнитель
fine aggregate мелкий заполнитель
moisture content содержание влаги
workability обрабатываемость (удобоукладываемость)
compressive load нагрузка на сжатие

3. Прочтите текст. Укажите, какие абзацы раскрывают содержание заголовка.

Text. The Most Important and Widely Used Building Materials

(Binding Materials, Concrete and Structural Steel)

(1) The designer must be able to select and adapt such materials of construction that will give the most effective result by the most economical means. In this choice of materials for any work of construction, the civil engineer must consider many factors. These factors include availability, cost, physical properties of materials and others.

(2) Timber, steel and concrete all vary, sometimes over considerable ranges in the properties desired by the engineer. Even steel, uniform as it appears to be, varies considerably in its microstructure. Concrete is even less uniform than many other materials.

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

(4) Another important class of cement is high alumina cement. High alumina cement is a material containing alumina. It has an extremely high rate of strength increase which is, owing to the violence of the chemical reaction, accompanied by a considerable evolution of heat. It is very resistant to chemical attack.

(5) It therefore follows that Portland cement like other materials can to some extent be modified to suit a particular application. The scope for such purpose-made cements has led to the development of an increasing variety such as high alumina cement, blast-furnace slag and pozzuolanas. Portland blast-furnace cement has greater resistance to some forms of chemicals.

(6) The most important building materials may now be considered to be structural steel and concrete. Concrete may be considered an artificial conglomerate of crushed stone, gravel or similar inert material with a mortar. A mixture of sand, screenings or similar inert particles with cement and water which has the capacity of hardening into a rockline mass is called mortar. The fundamental object in proportioning concrete or mortar mixes is the production of a durable material of requisite strength, watertightness and other essential properties at minimum cost. To attain this end careful attention must be given to the selection of cement, aggregate, and water.

(7) The most accurate method of measuring proportions is to weigh the required quantities of each material. It is widely used in large building construction, but in small building construction the less accurate method of measuring proportions by volumes is frequently used. The chief inaccuracies in volumetric measurement arise from the wide variation in the bulk of the fine aggregate due to small changes in its moisture content and faulty methods of filling measuring devices. Workability and strength tests are chief control tests made on concrete. To be able to undergo high compressive loads is a specific characteristic of this material.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, к каким абзацам текста могут служить заголовками данные предложения. Расположите их согласно последовательности изложения.

1. Technology of concrete production.
2. Composition of cement.
3. Materials for binding masonry units.
4. The properties of major building materials.
5. The properties of Portland cement.

2. Сгруппируйте следующие предложения по трем темам (A, B, C).

A. The choice of materials for any work of construction.
B. The properties of high alumina cement.
C. The composition of concrete.

1. Another important class of cement is high alumina cement. 2. Such a material may be considered an artificial conglomerate of crushed stone or gravel with a mortar. 3. The civil engineer must consider many factors when selecting the material for construction. 4. This kind of cement is very resistant to chemical attack. 5. The principal object in proportioning concrete is the production of a durable material of adequate strength and watertightness. 6. The factors that condition the selection of materials for construction include availability, cost and physical properties. 7. This material has an extremely high rate of strength increase. 8. Timber, steel and concrete vary over considerable ranges in the properties desired by the engineer and the latter should take them into consideration in selecting the materials. 9. The most accurate method of measuring proportions for concrete is to weigh the required quantities of each material.

3. Какие из данных предложений относятся к описанию цемента и какие — к описанию бетона?

1. This material is most widely used for the purpose of binding together masonry units such as stone and brick. 2. This material is also known to be the most important component of concrete. 3. This kind of material may be considered an artificial conglomerate of crushed stone, gravel or similar inert material with a mortar. 4. The material which contains alumina has an extremely high rate of strength increase. 5. The fundamental object in proportioning this material is the production of a durable material of requisite strength, watertightness and other essential properties. 6. The most accurate method of measuring proportions is to weigh the required quantities of each material.

4. Выберите правильные ответы на вопросы.

1. What influences the choice of building materials?

a) The choice of building materials is governed by the type and the function of a building. b) Availability, cost and physical properties are the main considerations for an engineer in selecting materials for construction. c) The techniques and methods of construction are the main factors influencing the choice of building materials.

2. What are lime, gypsum and cement most widely used for?

a) These three materials are not widely used for the purpose of binding together masonry units. b) They are used as components to produce concrete. c) With the large-scale con-

struction, lime, gypsum and cement may be considered to be the most important binding materials.

5. Дополните незаконченные предложения необходимыми по смыслу аргументами.

1. Cement is the most widely used building material because...

2. High alumina cement is an important class of cement since...

3. Careful attention must be given to the selection of cement, aggregate and water in proportioning concrete because...

4. Timber, steel and concrete vary greatly for...

6. Переведите письменно со словарем. (Время — 30 мин.)

Faced with a frightening picture of widespread destruction as a result of World War II, the postwar USSR was forced to develop new techniques and methods for rapid building of desperately needed housing.

The years of emergency reconstruction following World War II (1945-1950) saw a turning to industrialized, so-called "speed-building" methods of housing. It was during this period that prefabrication and prefabricated housing made their grand entry into Soviet housing industry. Widespread acceptance of the idea came in the late 1950's and early 1960's. Ceramic sheets and tiles, gypsum blocks (ceramic tiles made of plastic), gypsum panels, prefabricated ceiling panels and sets of doors and window openings, and even built-in furniture were introduced during these years. Consequently, early postwar industrialized housing attempts turned to large-block construction, in which Soviet builders had had some pre-war experience. By enlarging the size of building elements, labour costs and time were decreased.

7. Вставьте в предложения соответствующие союзные слова: than; so ... as; both and; not so ... as; as.

1. Concrete ... building material is more suitable timber. 2. ... workability ... strength tests are the chief control tests. 3. The designer selects such materials ... ... to give the most effective result. 4. Timber is durable concrete.

8. Найдите границу между главными и придаточными предложениями; переведите предложения на русский язык.

1. Timber, steel and concrete the designers so often use vary sometimes over considerable ranges in the properties.

2. As for alumina cement we use for binding purposes it is very resistant to chemical attack.

9. Просмотрите текст и постарайтесь составить как можно больше сочетаний со словами concrete, cement. (Например, the production of concrete, concrete mix и т. д.)

10. Заполните пропуски соответствующими формами инфинитива, данными внизу.

1. Under certain conditions, concrete is exposed by chemicals. 2. The most important building materials may now be considered . 3. Walls and piers may ... with stone. 4. Enough water should be used a placeable mix. 5. It is very essential for a building engineer ... physical and mechanical properties of the building materials. 6. ... undergo mechanical treatment is a specific characteristic of some materials. 7. No masonry material is known which is permanent when subjected to sea water.

1. to be structural steel and concrete; 2. to be attacked; 3. to produce; 4. to be placed; 5. to know; 6. to have been developed; 7. to be able to

11. Переведите на русский язык 4, 5, 6-й абзацы текста.

12. Дайте глаголы, соответствующие данным словам.

selection, designer, considerable, addition, elaboration, development, appearance, desirable, mixture, resistant, application, production, suitable, measuring, construction, representative

13. К каждой паре слов подберите русское слово с тем же корнем, что и английское слово (см. упр. 11, с. 21).

1. adapt — приспосабливать (...); 2. civil — гражданский (...); 3. accurate — точный (...); 4. plaster — штукатурка (...); 5. component — составная часть (...); 6. contain — содержать (...); 7. modify — изменять (...); 8. variety — разнообразие (...); 9. structural — строительный (...); 10. inert — нейтральный (...); 11. essential — существенный (...); 12. test — испытание (...)

14. Проанализируйте состав следующих слов и словосочетаний. Переведите их на русский язык.

rapid-hardening; high-early strength; high-alumina; purpose-made; blast-furnace; rocklike; watertightness; lightweight; large-size elements; semi-rigid

15. Укажите, какие из следующих утверждений являются правильными, какие нет. Дайте свои обоснования не менее чем в двух-трех фразах.

Образец: Steel and concrete are most widely used for binding together masonry units.
This statement is incorrect. Lime, gypsum and cement are used in building construction for the purpose of binding masonry units.

1. The most important building materials may now be considered to be structural steel and concrete. 2. Lime, gypsum and cement are the three materials most widely used for making concrete. 3. Cement is the most important component of bricks.

16. Дайте не менее трех вариантов ответа на данные вопросы.

1. Why is concrete the most important building material? 2. What is it necessary for the designer to know in order to select the most effective building materials?

17. Прослушав текст, прочитанный преподавателем, отметьте следующие предложения в виде данной таблицы.

Виды строительства, где используется предварительно-напряженный сборный бетон	Трудности использования балок большой длины

18. Переведите письменно со словарем. (Время — 30 мин.)

Reinforced-Concrete Elements Production

With the rapid growth in the employment of precast-concrete products, and particularly of wall panels, slabs, beams, etc., to serve a multitude of building needs, this industry has to maintain and improve the quality of the products. A vast amount of excellent work has already been done to raise the standards of this industry to their present level. Machinery and equipment designers have made important contributions by creating better machines and tools for the industry.

A great number of plants producing precast reinforced-concrete elements is now in operation in our country and abroad. Before the decision is made to establish a precast concrete products plant in a given area, a number of purely economic considerations deserve particular attention. A careful

appraisal of the potential requirements provides valuable information for determining the size of the plant which should be built. A well-designed plant must have sufficient capacity for the normal output plus a reasonable margin for a possible increase. The design should specifically and carefully anticipate the future installation of additional equipment for increased production without disrupting the original lay-out.

III — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

structural, technological, functions, zones, ordinary, effective, thermal, economical, plastics, synthetic, textile, physical, mechanical, polymer, organic, complex, components

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

mass production массовое производство

prefabricated concrete elements сборные железобетонные элементы

reinforced concrete elements железобетонные элементы

brittle хрупкий

tensile stress сжимающая нагрузка

volume weight объемный вес

thermal conductivity теплопроводность

rigid жесткий

resin смола

bending loads изгибающие нагрузки

3. Прочтите текст. Укажите, в каких абзацах текста раскрывается смысл заголовка.

Text. The Choice of Material

(1) Which material can be used to the best advantage for a particular part of the building, depends as well on the kind of load to which it is subjected and on the shape of the part. That the development of the metallurgical and machine-building industry made possible mass production of prefabricated large-size concrete and reinforced-concrete structural elements is a well-known factor to influence the choice of materials.

(2) Reinforced concrete is a building material in which the joint functions of concrete and steel are advantageously utilized. Being brittle, concrete cannot withstand tensile

stresses, and it cannot therefore be used in structures subjected to tensile stresses under load. But if steel is introduced into concrete it changes the property of the monolith.

(3) There are two kinds of reinforced concrete: with ordinary reinforcement and concrete with prestressed reinforcement. To reinforce ordinary concrete structures is to introduce steel rods in stretched zones of concrete elements. Reinforced-concrete structures and elements are widely used both for residential houses and industrial buildings.

(4) In many cases bricks too are very satisfactory for use in the construction. Bricks generally present a pleasing appearance and can be obtained with various qualities, colours, and textures. Being of a high volume weight and high thermal conductivity, ordinary brick is not always satisfactory in building practice. There are other kinds of bricks which are more effective, they are light-weight building bricks, hollow or porous bricks. Light-weight building bricks differ from ordinary clay bricks in a lower volume weight and lower thermal conductivity, and are therefore more economical than ordinary bricks.

(5) One of the most significant facts about both industry and building has been research on synthetics and plastics. Plastics have appeared comparatively recently but, owing to their inherent valuable and diverse properties, have found a wide application in many industrial fields (machine-building, aviation, textile industry, etc.).

(6) In respect to physical and mechanical properties at a normal temperature of 20°C all plastics are divided into rigid, semi-rigid, soft and plastic. In respect to the number of constituents plastics may be classified as simple and complex.

(7) Plastics consisting of one polymer are referred to as simple. Thus, organic glass (plexiglass) consists of one synthetic resin. But in the building field we usually deal with complex plastics, e.g. plastics consisting of a polymer and other components.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Подберите английские эквиваленты к следующим русским словосочетаниям.

успешно используются	1. diverse properties
растягивающее напряжение	2. tensile stress
свойства материалов	3. properties of the materials
прочность на сжатие	

в зависимости от применения	4. depending on application
приятный внешний вид	5. pleasing appearance
разнообразные свойства	6. mechanical properties
широкое применение	7. wide application
простой кирпич	8. compressive strength
	9. are advantageously utilized
	10. ordinary brick
	11. volume weight

2. Разделите текст на части и определите, заголовком к какой части могут служить данные предложения. (Время — 5 мин.)

1. The main characteristics of concrete.
2. The chief principles of plastics classification.
3. Factors that influence mass production of prefabricated large-size concrete and reinforced-concrete structural elements.
4. New tendencies in the choice of building materials.
5. The advantages of reinforced concrete.

3. Найдите, какие из данных предложений относятся к описанию бетона, кирпича и пластмасс.

1. There are some kinds of structural materials that have appeared comparatively recently, sometimes they consist of one polymer. But in building industry some complex materials consisting of a polymer and other components are used. 2. In many cases bricks too are very satisfactory for use in the construction. 3. There are some kinds of materials which are brittle and cannot withstand tensile stress. 4. If steel is introduced into some kind of material it changes its property. 5. Some building materials offer a good resistance to compressive loads. 6. In respect of physical and mechanical properties these materials are divided into rigid, semi-rigid and soft.

4. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. Using prefabricated or precast elements...

a) depends only on the kind of load to which it is subjected; b) builders perform a considerable amount of building work not in situ but at a factory; c) made possible mass production of large-size structural elements.

2. Reinforced concrete is a building material in which...

a) such properties as small volume weight and high thermal conductivity are combined; b) physical and mechanical properties at a normal temperature of 20°C make it semi-rigid and soft; c) the joint functions of concrete and steel are advantageously utilized.

3. Bricks generally present a pleasing appearance and...
a) they are light-weight building materials; b) cannot be used in structures subjected to tensile stresses; c) can be obtained with various qualities, colours and textures.

5. На основании содержания текста ответьте на следующие вопросы.

1. For what types of construction are reinforced concrete structures and elements used? 2. What new materials have come into use both in industry and building? 3. What made possible the mass production of prefabricated large-size concrete elements? 4. In what industrial fields are plastics used? 5. How does steel introduced into concrete change its properties?

III — 2A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

million, excavator, planning, bulldozer, tractor, scraper, to absorb, canal, anatomically

2. Вспомните значения следующих английских слов, знакомых вам из предыдущих уроков.

important, to start, to carry out, equipment, mechanized, site, advantage, to divide, soil, vehicle, to mount, surface, ground, source

3. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

plant механическое оборудование, парк (*машин*)
levelling планировка, планировочные работы
site строительная площадка
excavation земляные работы
to plane off сострагивать, снимать слой
bucket ковш
trenching рытье траншей
wheel ротор; колесо
blade отвал, нож
shovel прямая лопата
to power приводить в действие

4. Прочтите текст. Укажите, какие основные темы освещаются в нем.

Text. Earth-Moving Machinery

(1) The annual amount of mechanized earth digging operations in the Soviet Union comes up to thousands of millions of cubic metres. It requires the employment of a great plant of powerful earth-moving machines, the excavators being the most important of them.

(2) It is not possible to start on a construction job without a good deal of preliminary levelling the site. To carry out this work one must employ the earth-moving equipment.

(3) Site preparation and excavation are the most fully mechanized of all the operations in building construction. Most excavating machinery is heavy and slow-moving and must be carried from site to site on special transporters. It is clear that the use of expensive mechanical plant requires careful planning and efficient site organization if full advantage is to be taken of its high rate of production.

(4) Plant for site preparation and excavation can be divided into four classes. First, machines which plane off a thin layer of soil and push it in front of them. Second, machines which plane off a thin layer of soil, at the same time picking it up and carrying it where required. Third, machines which dig out soil by some form of a bucket, and load it for transportation into separate vehicles. Forth, machines designed specially for trenching by means of a number of buckets mounted either on a continuous chain or on a wheel.

(5) In the first class are bulldozers of different types. A bulldozer represents by itself an earth-moving machine which carries out its work with the aid of a blade mounted on a tractor of either crawler or wheel type.

(6) A scraper, which belongs to the second class of earth-moving machines, is simply a large box with an open mouth, dragged along the surface of the ground until it is full. It has a cutting edge that digs. There is a considerable variety of the scrapers, from small units to huge ones made to accommodate 30 cubic yards of soil and to absorb the power of two tractors while at work.

(7) Revolving shovels, which belong to the third class of earth-moving machines, made their first appearance in 1835 in the form of a part-swing shovel mounted on railroad tracks. It was powered by steam, it was slow and clumsy, but it did the work. Into Great Britain they were introduced from America in 1887 to work on the Manchester Ship Canal. They were a source of wonderment to the people of that part of the country and trips were organized to provide a view of the "American Devils" as they were popularly called.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Отметьте, какие из данных утверждений неправильны или не соответствуют содержанию текста.

1. On large construction sites where a considerable volume of concrete is required a central mixing plant is generally used. 2. A bulldozer is an earth-moving machine which planes off a thin layer of soil, picks it up, and carries it where required. 3. The tower cranes are employed for lifting materials and structural elements onto the buildings being erected. 4. The first revolving shovels were mounted on railway tracks and powered by steam. 5. Site preparation and excavation are operations which are usually carried out with manpower. 6. A scraper is simply a large box fitted with a cutting edge that digs. 7. Since excavators are heavy and slow-moving machines, they are carried from site to site on special transporters.

2. Найдите в данном отрывке предложение, являющееся ответом на заданный вопрос. (Время — 3 мин.)

Are the excavators fast-moving machines?

Site preparation and excavation are labour-consuming operations. At present they are the most fully mechanized of all the operations carried out in building construction. But earth-moving machines are heavy and slow-moving units, therefore they must be carried from site to site on special trailers. It is clear that such expensive mechanical plant as excavators must be made to carry out various classes of work.

3. Соедините попарно следующие неполные предложения из групп A и B.

A. 1. The best economy is achieved when an all-purpose earth-moving machine is designed... 2. A scraper is simply a box made of sheet steel with an open mouth... 3. Site preparation and levelling are... 4. It is not possible to start on a construction job... 5. The use of expensive mechanical plant requires...

B. 1. ...without a good deal of preliminary levelling the site. 2. ...the most fully mechanized of all the operations in building construction. 3. ...carefull planning and efficient site organization. 4. ...capable of being converted to suit any class of work. 5. ...which is dragged along the surface of the ground until it is full.

4. К какому из неоконченных предложений (a, b, c) относятся данные фразы?

1. one must use earth-moving equipment.

a) As the years went on... b) To carry out this work... c) During the last fifty years...

2. can be divided into four classes.

a) Machines, which plane off a thin layer of soil... b) The annual amount of digging operations... c) Plant for site preparation and excavation...

3. an earth-moving machine, which carries out its work with the aid of a blade mounted on a tractor.

a) A scraper, which belongs to the second class of earth-moving machines, is... b) A bulldozer is... c) A revolving shovel, which belongs to the third class, is...

5. Составьте план-конспект к тексту на английском языке; прокомментируйте пункты плана как можно подробнее на русском языке.

6. Переведите следующие предложения, обращая внимание на функцию past participle.

1. The mechanical excavating plants dealt with in this chapter are multi-purpose excavators. 2. Properly applied the excavators carry out the work rapidly and at low cost. 3. The plant consists of a base frame mounted on crawler tracks, with a revolving platform positioned on top of the frame. 4. Many of the problems met in the design and discussed here are common in both forms of structures. 5. If fitted with different equipment the excavator can be adapted to carry out various digging operations. 6. Mounted on crawler tracks this excavator can be used under very adverse site conditions.

7. Переведите следующие предложения; определите границы абсолютного причастного оборота.

1. At present a great plant of powerful earth-moving machines is used, the excavators being the most important item. 2. The scrapers plane off a thin layer of soil, the latter being picked up and carried where required. 3. The multi-bucket excavators are designed specially for trenching, this being done by means of a number of buckets mounted either on a continuous chain, or on a wheel.

8. Образуйте из следующих глаголов существительные, используя суффиксы 'tion (-ion)', '-ment'.

require, construct, excavate, employ, prepare, equip, transport, accommodate, wonder, recognize, introduce, attach, complete

9. Соедините попарно слова из двух данных колонок, образуя термины.

earth-moving	tractor
excavating	shovel

site	equipment
continuous	plant
crawler	preparation
pneumatic	edge
cutting	tracks
revolving	machinery
railroad	chain
mechanical	tyre

10. Подберите слова близкие по значению из двух данных групп слов.

annual	1. to reach
amount	2. to fulfil
to come up to	3. work
to require	4. to have room for
job	5. yearly
preliminary	6. to demand
to carry out	7. not small
to excavate	8. quantity
continuous	9. to dig
considerable	10. preparatory
huge	11. enormous
accommodate	12. endless

11. Переведите текст письменно со словарем. (Время — 30 мин.)

Mobile Cranes

The function of a crane is to hoist or lower a load suspended from its jib. Various types of cranes are available, the type and size best suited for a specific operation being influenced by the following factors: 1. The nature of the work on which it is to operate. 2. The weight of load it has to handle.

Mobile cranes have a wide range of uses on building and civil engineering works of construction. Cranes of this type usually take the form of a frame carrying a jib, a winch, and other necessary hoisting and controlling equipment, the whole being mounted on a cast-iron bed plate fitted with road wheels of the pneumatic type. One may also have them mounted on caterpillar tracks or on a lorry chassis if desired.

At present rope-operated mobile cranes are being superseded by hydraulically operated ones, in which all working operations, but travelling, are performed with the help of hydraulic rams. The jib of the mobile crane can be of the solid or latticed type, the latter being preferred now because of its lower weight.

12. Прослушав текст, прочитанный преподавателем, а) укажите, какие из приводимых ниже утверждений не соответствуют содержанию прослушанного текста.

1. A disadvantage of cranes with telescopic booms is that it takes much time to bring them into action from the travelling position. 2. The ability to change the length of the telescopic boom makes it possible to vary the load-lifting capacity of the crane. 3. The hydraulic rams used in hydraulically operated mobile cranes lower the manoeuvrability of such cranes.

б) Опишите два основных достоинства мобильного крана с телескопической стрелой.

III — 2B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните русские слова, имеющие те же корни, что и следующие английские слова. Используйте их для понимания текста.

universal, dragline, conversion, to control, tendency, hydraulic, progressive, optimum, to select, stability, operation, telescopic, to separate, crane

2. Вспомните значения следующих английских слов, подберите к ним перевод из правого столбца.

ground	1. оборудовать
bucket	2. заменять
boom	3. колесо
to equip	4. грунт
comparatively	5. угол
to replace	6. ковш
angle	7. сравнительно
wheel	8. дополнительный
additional	9. траншея
levelling	10. направление
direction	11. стрела
trench	12. планировочные работы; выравнивание

3. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

earth-moving machine землеройная машина
attachments сменное оборудование
shovel прямая лопата
dragline драглайн
backacter, backhoe обратная лопата
grab, clamshell грейфер
outrigger arms аутригеры

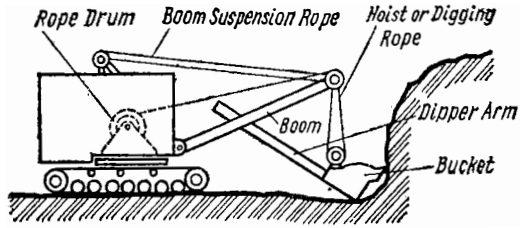

Fig. 1. Shovel

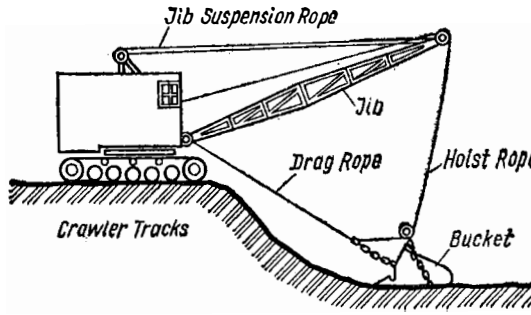

Fig. 2. Dragline

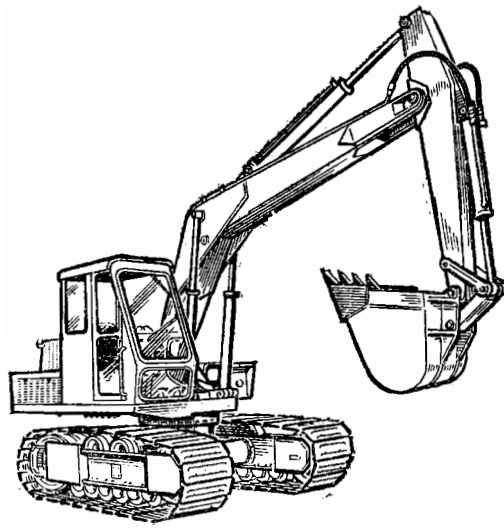

Fig. 3. Backacter
or backhoe

dipper arm рукоять ковша
jack домкрат
slope уклон, скат, откос
guides направляющие
discharge разгрузка
track гусеница

4. Прочтите текст. Назовите 4—5 преимуществ экскаваторов с гидравлическим управлением по сравнению с экскаваторами с канатным управлением.

Text. Excavators

(1) The universal excavator is an earth-moving machine that can be equipped with different attachments known under the following names: 1. shovel (Fig. 1); 2. dragline (Fig. 2); 3. backacter or backhoe (Fig. 3); 4. grab or clamshell; 5. crane. Conversion from one type to another is a comparatively easy operation.

(2) Some decades ago only rope-controlled excavators were in use. Now there exists a tendency to replace the latter by more progressive hydraulically operated excavators. Especially widely used are now hydraulic backhoes.

(3) In hydraulically operated backhoes hydraulic rams are used in place of ropes and winches to operate the boom and the dipper arm. The hydraulic system makes it possible to pivot the bucket on the dipper arm. This movement provided by an additional ram on the dipper arm gives the operator a means for selecting the proper angle of cutting for the bucket both at the start of the digging stroke and during the stroke to obtain optimum digging performance.

(4) With the wheeled excavator, which is considerably lighter than the crawler mounted one, means to provide additional stability are incorporated. Before starting digging operation outrigger arms are operated hydraulically. Independent movement of the outrigger arms provides for levelling the machine on sloping ground, so that trenches with vertical sides can be cut perpendicular to the direction of the slope. In some models the revolving superstructure of the machine can be moved transversely in special guides, so that a trench can be dug parallel and close to a wall or some other obstruction, this movement being carried out hydraulically too.

(5) A recent model incorporates a telescopic dipper arm: when extended it can dig deeper and has a greater discharge height and when retracted it produces its greatest digging force at the bucket.

(6) At present excavators are available in which all the digging motions as well as slewing are operated hydraulically. The crawler-mounted excavator has two other advantages over its rope-operated counterpart: with separate hydraulic motors

for each track it is possible to put one track in reverse while the other is driven forward, so that the machine can be turned within its own length, and the boom can be of the adjustable radius type, so that the reach, digging depth and discharge height can be quickly varied to suit the job.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, в каких абзацах текста имеются ответы на поставленные вопросы.

1. What attachments can be used to equip the universal excavator? 2. Why are the backacters with telescopic booms very widely used now? 3. Can hydraulically operated excavators dig trenches with vertical sides on sloping ground? 4. Why is it profitable to change the angle of cutting in the process of digging? 5. Are hydraulically operated excavators more progressive than the rope-operated ones?

2. Соедините попарно данные неполные предложения из групп A и B.

A. 1. In some hydraulically operated excavators the revolving superstructure... 2. With extended telescopic boom... 3. With separate hydraulic motors for each track...

B. 1. ...the machine can turn within its own length. 2. ...can be moved perpendicularly to the longitudinal axis of the machine in special guides. 3. ...the excavator can dig deeper trenches and discharge the spoil at greater heights.

3. Соедините попарно слова из двух колонок с тем, чтобы образовать термины.

rope-controlled	1. of cutting
hydraulic	2. mounted
angle	3. superstructure
crawler	4. ram
revolving	5. excavator
telescopic	6. arm
dipper	7. boom

РАЗДЕЛ IV

SANITARY ENGINEERING IN THE MODERN TOWN

IV — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

atmospheric, temperature, comfort, emphasis, control, concept, radiation, transmission, energy, human, component,

system, fundamental, central, special, radiator, to generate, to circulate, panel, proportion, factor, type, location, climate, natural, gas, electricity

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

atmospheric environment атмосферная среда
efficiency производительность; к. п. д.
contamination of the air загрязнение воздуха
loss of heat потеря тепла
central heating центральное отопление
hot-water (heating) system система водяного отопления
boiler котел
steam (heating) system паровое отопление
copper pipes медные трубы
panel heating system панельное отопление

3. Прочтите текст. Укажите, в каких абзацах раскрывается содержание заголовка.

Text. Panel Heating

(1) Heating and ventilation are two branches of engineering which are very closely connected, they are therefore treated as a dual subject. Both are concerned with providing a required atmospheric environment within a space, the former with respect to heat supply to produce a desired temperature for maintaining comfort, health or efficiency of the occupants, the latter with regard to supply and removal of air frequently with emphasis on contamination of the air. Air conditioning is closely related to both heating and ventilation.

(2) It is for heating to prevent the too rapid loss of heat from the body. By heating the ambient air of walls, ceiling or floor the rate of heat loss from the body is controlled. Some old concepts of heating were gradually changed since engineers obtained more precise knowledge about how the body loses heat. Insufficient attention was paid formerly to loss by radiation, which is the transmission of energy in the form of waves from a body to surrounding bodies at a temperature. The human being also loses heat by conduction (through his clothes) and convection.

The determination of the capacity or size of the various components of the heating system is based on the fundamental concept that heat supplied to a space equals heat lost from the space. The most widely used system of heating is the central heating, where the fuel is burned in one place — the basement or a specially designed room and from which steam, hot water

or warm air is distributed to adjacent and remote spaces to be heated.

(3) There are two most common systems of heating—hot water and steam. Both systems are widely used nowadays. A hot-water system consists of the boilers and a system of pipes connected to radiators suitably located in rooms to be heated. The pipes, usually of steel or copper, feed hot water to radiators or convectors.

(4) As for steam systems, steam is generated usually, at less than 5 pounds per square inch in the boiler and the steam is led to the radiators through or by means of steel or copper pipes. The steam gives up its heat to the radiators and the radiators to the room and the cooling of the steam condenses it to water. The condensate is returned to the boiler either by gravity or by a pump. The air valve on each radiator is necessary for air to escape. Otherwise it would prevent steam from entering the radiator.

(5) Recent efforts to completely conceal heating equipment have resulted in an arrangement whereby the fluid, whether it be hot water, steam, air, or electricity, is circulated through distribution units embedded in the building construction. Panel heating is a method of introducing heat to rooms in which the emitting surfaces are usually completely concealed in the floor, walls, or ceiling.

As for fuels used for heating buildings they include coal, oil, manufactured and natural gases and wood. There are two other sources: electricity and steam. Nowadays gas fuel is being used on an ever increasing level.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Сверяясь с текстом, подберите соответствующий перевод из правого столбца к данным английским словам.

cooling (4)	1. потолок
space (1)	2. обеспечивать
to maintain (1)	3. отопление
removal (1)	4. окружающая среда
contamination (1)	5. паровое отопление
loss (2)	6. определение
precise (2)	7. получать, приобретать
equal (2)	8. равный
heat supply (1)	9. применение
environment (1)	10. удаление
to obtain (2)	11. потеря
determination (2)	12. точный

to provide (1)
steam heating (3)
ceiling (2)

13. загрязнение
14. охлаждение
15. поддерживать
16. пространство
17. топливо

2. Укажите, какое из данных предложений отражает основное содержание текста. (Время — 5 мин.)

1. The human being loses heat by conduction and convection. 2. Heating is a branch of engineering which is concerned with providing heat supply to produce a desired temperature within a space. 3. A hot-water system consists of the boilers and a system of pipes.

3. Расположите предложения согласно последовательности изложения.

1. Fuels used for heating buildings. 2. Some old concepts of heating. 3. The principle of central heating.

4. В соответствии с содержанием текста найдите правильные ответы на данные вопросы.

1. What are heating and ventilation concerned with?

a) Heating and ventilation deal with supply and removal of air. b) Heating and ventilation are concerned with providing a required atmospheric environment within a space. c) Heating and ventilation are meant for heat supply to produce a desired temperature.

2. Why do industrial buildings maintain a lower air temperature?

a) Industrial buildings maintain a lower temperature because it is necessary for the machinery they have. b) Industrial buildings where the degree of activity is high maintain a lower air temperature because the heat loss from the body is greater and a compensatory heat balance is provided. c) Industrial buildings maintain low temperatures because they have great amount of outside wall space and lose considerable amounts of the heat supplied.

5. Дополните незаконченные предложения необходимыми по смыслу аргументами.

1. Some old concepts of heating were gradually changed since...

2. The system of panel heating spares space in the room because...

3. Heating and ventilation are very closely connected for...

4. The out valve on each radiator is necessary because...

6. Найдите, какие из данных предложений относятся к описанию отопления и какие — к описанию вентиляции.

1. This branch of engineering is concerned with supply and removal of air with emphasis on contamination of the latter. 2. This system consists of the boilers and a system of pipes connected with radiators located in rooms. 3. There is a certain method of introducing heat to rooms in which the emitting surfaces are usually completely concealed in the floor, walls or ceilings. 4. This branch of engineering has gradually come to be associated with cleaning of air.

7. Определите границу между главными и придаточными предложениями. Переведите предложения на русский язык.

1. As for fuels we use for heating buildings they include coal, oil, manufactured and natural gases. 2. Some time elapses between the moment the steam gives up its heat to the radiators and the time the cooling of the steam condenses it to water. 3. Industrial buildings often present special problems which the designers find most difficult to solve. 4. There are certain industrial processes we know to be accompanied by the production of air-born dust. 5. Were all-year air-conditioning systems set up, all the processes required for winter and summer air conditioning could be performed. 6. Floor panel heating we so often find in one-story and basementless structures is of great comfort and low installation cost. 7. Some old concepts of heating were gradually changed since engineers obtained more precise knowledge about the heat the human body loses.

8. Просмотрите текст и постарайтесь составить как можно больше сочетаний со словами heating, ventilation.

9. Заполните пропуски соответствующими составными союзами: although ... but; whether ... or; as well as; neither... nor; either or; both ... and; not only ... but also; as ... as.

1. Gases expand and contract ... when the temperature changes ... when the air pressure alters. 2. Air-conditioning is closely related to ... heating ... ventilation. 3. Gases have size ... shape of their own. 4. Gas supply is used for cooling, water heating, refrigeration for food ... for space heating. 5. ... ventilation was formerly concerned with the supply of fresh air to the space ... it gradually came to be associated with cleaning of air. 6. Air can be cooled by passing it through ... a cooling coil ... a spray of chilled water in an air washer. 7. Industrial buildings may be divided into two classes according to the plan must give greater attention to the

size of machinery the movement of persons. 8. In our modern world of science and highly developed technology air-conditioning is important heating and ventilating.

10. Используя префиксы прилагательных с отрицательным значением ('un-', 'in-'), дайте одно слово вместо двух. Переведите производные на русский язык.

not sufficient; not desirable; not efficient; not controllable; not obtainable; not supplied; not suitable; not usual; not complete; not natural

11. Переведите следующие сочетания слов.

heat supply; clothing surface; heating system; air valve; wall partitions; steam system; air conditioning; hot-water system; heating equipment; distribution units; building construction; panel heating; room height; heat-storing capacity

12. Переведите на русский язык 1, 2, 5-й абзацы текста.

13. Опровергните следующие неправильные утверждения не менее чем двумя высказываниями каждое (см. упр. 14, с. 12).

1. With panel heating the source of heat is located in the room in the form of a special radiator. 2. Heating and ventilation are two separate branches of engineering which are not connected in any way.

14. Ответьте на следующие вопросы, давая как можно больше вариантов ответа в соответствии с содержанием текста.

1. What is necessary to maintain comfort in a building? 2. Why have new methods of heating come into being?

15. Как инженер-строитель на основе содержания текста объясните на английском языке цели и назначение отопления и вентиляции в зданиях.

16. Прослушав текст, прочитанный преподавателем, 1) запишите (по-русски) предложение, в котором характеризуются преимущества центрального отопления; 2) отметьте, в какой связи упоминаются следующие цифры: 40, 20, 100,000, 1,000.

IV — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

modern, technology, industrial, process, extremely, delicate, inertial, rocket, airplane, theatre, department, residence, filter, minimum, electrostatic, maximum, to calculate,

factor, tendency, theory, effect, sum, general, assembly, normally, to associate, toxic, intensive, utilization, economic, principal, limit, transport, commercial, restaurant

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

air-conditioning кондиционирование воздуха
(close) control (тщательное) регулирование
humidity влажность
purity чистота
installations установки
department stores универсальные магазины
excess heat избыток тепла
supply of air подача воздуха
removal of air вывод воздуха
contaminated air загрязненный воздух
fumes запахи; испарение; дым
hazardous to health опасный для здоровья
modern amenities современные удобства
space heating отопление помещения

3. Прочтите текст. Укажите, какие абзацы раскрывают содержание заголовка.

Text. All-Year Air Conditioning, Ventilation, Gas Supply

(1) Air conditioning implies the control of temperature, humidity, purity and motion of the air in an enclosure. In our modern world of science and highly developed technology air conditioning is of great significance for industrial processes as well as for human comfort.

(2) Air conditioning for human comfort is employed in both large and small installations, such as theatres, office buildings, department stores, residences, airplanes, railways, cars and submarines.

(3) All-year air-conditioning systems must provide means for performing all the processes required for winter and summer air conditioning. The basic pieces of equipment are the filters, preheat coils, humidifiers, dehumidifiers, reheat coils, additional cooling coils, fans and controls. The control of air purity can be achieved in various degrees. As a minimum control some sort of filtering must be done near the entrance of the air-conditioning system. Possibly the most efficient filtering device is the electrostatic precipitator.

(4) In order to establish the size and operational requirements of an air-conditioning system, the maximum probable heating and co-demands have to be calculated. The maximum probable heating demand is usually for winter air condition-

ing and it involves heating and humidifying. The maximum probable cooling demand is generally for summer applications and requires cooling and dehumidifying.

(5) As far as ventilation is concerned the modern theory to this effect can be summed up in the statement that for places of general assembly the purpose of ventilation is to carry away excess heat and odours and that normally 10 cu. ft per minute of outside air per person is sufficient to accomplish this objective. In buildings such as homes, the leakage of air through cracks in doors and windows is usually sufficient to meet this requirement. Although ventilation was formerly concerned with the supply of fresh air to and the removal of hot and contaminated air from the space it gradually came to be associated with cleaning of air.

(6) Industrial buildings often present special problems in ventilation. There are certain industrial processes that are accompanied by the production of air-born dust, fumes, toxic vapours and gases which are hazardous to the health of workers.

(7) Another indispensable part of modern amenities is gas supply. It has come now to be of a very wide use. With an intensive exploration of finding natural gas it has gradually replaced the manufacture in its utilization. At the present time natural gas is put to large-scale economic use. The principal utilization of natural gas is as a clean, convenient, economical source of heat. In homes it is used for cooking, water heating, refrigeration for food as well as for space heating.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, к каким абзацам текста могут служить заголовками данные предложения. Расположите их согласно последовательности изложения. (Время — 5 мин.)

1. Gas supply as an important part of modern amenities.
2. Ventilation for industrial buildings.
3. The importance of air conditioning for human comfort.
4. The basic parts of equipment for an all-year air-conditioning system.

2. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. Air conditioning implies...

a) rapid loss of heat; b) provision for the expansion of the water; c) the control of temperature, humidity, purity and motion of the air.

2. The purpose of ventilation is...

a) to produce a desired temperature for maintaining comfort; b) to maintain air purity at an extremely high level; c) to carry away excess heat and odours.

3. The basic pieces of air-conditioning equipment are...

a) stokers, coal furnaces and boilers; b) filters, preheat coils, humidifiers, reheat coils, fans and controls; c) boilers and a system of pipes.

3. Сгруппируйте следующие предложения по трем темам.

A. Air Conditioning.
B. Gas Supply.
C. Ventilation.

1. Gas supply has come to be very widely used. 2. In industrial buildings three types of ventilation are in use so as to control dangerous gases and dusts. 3. In buildings such as homes, the leakage of air through cracks in doors and windows is usually sufficient. 4. As for the purpose air-conditioning system may be described as winter, summer and all-year. 5. The main utilization of natural gas is as a clean, convenient, economical source of heat. 6. Natural gas supply is used also as a heat source in commercial establishments. 7. Certain industrial process requirements and human comfort are the two major factors to be considered when designing an air-conditioning system. 8. Air conditioning is meant for the control of temperature, humidity, purity and motion of the air in an enclosure. 9. The main purpose of ventilation is to carry away excess heat and odours.

IV — 2A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

cycle, atmosphere, to vary, proportion, phenomenon, reservoir, to classify, gravel, sanitary, domestic, standard, modern, location, protection, mineral, resources, flora, community

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

water supply водоснабжение
saturated насыщенный
moisture влага

through the medium при помощи, посредством
natural water sources естественные источники воды
body of water водный массив
inland lake материковое озеро
undersoil подпочва
stratum слой, пласт
sewage disposal system система удаления сточных вод
pollution загрязнение
to foul загрязнять(ся), засорять(ся)
consumption потребление
purity чистота
contamination загрязнение
water treatment водоподготовка

3. Прочтите текст. Укажите, в каких абзацах текста раскрывается смысл его заголовка.

Text. Water Supply

(1) Water is an important part of nature which surrounds us and of those natural conditions we are changing constantly and ever more intensively: the flora, the soil, the mountains, mineral resources, the deserts, the marshes, the steppes and the taiga.

(2) Water passes through a very interesting natural cycle. The atmosphere which surrounds the earth's surface contains water which varies in amount in direct proportion to the temperature of its gases. Water is also evaporated into atmosphere. Atmosphere which has become saturated with water precipitates its moisture when the temperature lowers. This phenomenon is termed rainfall. The moisture falls to the earth and finds its way into a number of reservoirs provided by nature.

(3) Vast depressions in the earth are filled with water through the medium of natural water sources such as rivers lakes, etc. over the earth's surface. These bodies of water are classified as inland lakes and are excellent sources of water.

(4) Sometimes the rainfall finds its way into the soil and forms water bodies at various levels because of the impervious nature of the undersoil. Often a water body deep in the soil consists of a sand or gravel stratum which connects or empties into the basin of an inland lake and provides a splendid source of water supply through the medium of a drilled well.

(5) Man uses water for domestic and sanitary purposes and returns it to the source through sewage disposal system. Industry likewise replaces water diverted to its use. Hence the cycle is completed but it is of prime importance that the supply be protected against pollution, for if it fouls no one can predict how disastrous may be the results.

(6) An adequate supply of pure, wholesome and palatable water is essential to the maintenance of high standards of health and to provide the convenience modern society demands. In some localities water is available in unlimited quantities and converting it to use is not a difficult problem. This is especially true of towns situated on large inland lakes or rivers. On the other hand there are cities where geographical location requires elaborate systems of water supply, and to provide a satisfactory supply of water in these localities becomes a large engineering task.

(7) The importance of a sufficient supply of water for domestic and industrial purpose has long been a deciding factor in the location of cities. The earliest settlers realized this need and took advantage of natural water sources by establishing colonies in close proximity to them.

(8) Water may be taken from any sources of water for human consumption after it has undergone a preliminary treatment to assure its purity. As man's communities grew in population, the demand for water increased and the need for protection of the source of water supply against the possibility of contamination became evident. Progress and civilization have called for elaborate and various systems and methods of water treatment.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. К каждой данной паре слов подберите русское слово с тем же корнем, что и английское слово.

О б р а з е ц: reservoir — водоем (резервуар)

1. natural — естественный (...); 2. adequate — достаточный, соответствующий (...); 3. unlimited — неограниченный (...); 4. colony — население (...); 5. protection — защита (...); 6. progress — развитие (...)

2. Укажите, какое из данных предложений выражает главную мысль текста.

1. On the earth water can be obtained from different natural sources. 2. At present the problems of water supply and treatment are the most essential for mankind. 3. Water taken from natural sources such as rivers and lakes often requires aeration.

3. Какие из данных предложений выражают основное содержание текста? Расположите их согласно последовательности изложения.

1. An adequate supply of water is one of the main requirements for maintaining high standards of health. 2. Vast de-

pressions in the earth filled with water and known as inland lakes are excellent sources of water. 3. The rivers and lakes contain a great amount of chemical and biological pollution. 4. Nowadays the problem of water treatment has become very urgent. 5. On the earth water passes through a very interesting physical cycle. 6. Water bodies deep in the soil are excellent sources of water. 7. Man after using water returns it to the source by means of sewerage systems; thus the cycle is completed. 8. Water is an important part of nature. 9. Man's earliest settlements were always close to natural water sources.

4. Дополните незаконченные предложения одним из данных вариантов (a, b, c) в соответствии с содержанием текста.

1. An adequate supply of pure, wholesome and palatable water...

a) is especially true of towns situated on large inland lakes or rivers; b) is essential to the maintenance of high standards of health; c) may be taken from any source of water.

2. There are cities where geographical location...

a) makes water pass through a very interesting cycle of treatment; b) requires elaborate systems of water supply; c) makes the problem of water supply very difficult.

3. The earliest settlers took advantage of natural water sources by...

a) building water power stations on them; b) establishing colonies near them; c) providing sufficient water supply for their needs.

5. "Memory test". Восстановите по памяти (на русском языке), в каком контексте упоминаются следующие английские словосочетания.

1. ...is essential to the maintenance of high standards of health.

2. ...is an important part of nature which surrounds us.

3. ...has long been a deciding factor in the location of cities.

6. Переведите предложения, обращая внимание на выделенные слова.

1. This is especially true of towns **situated** on large inland rivers and lakes. 2. The earlier colonies were usually **situated** near natural water sources. 3. An adequate supply of water is essential to satisfy modern society **demands.** 4. To maintain high standards of health modern society **demands** an adequate **supply** of water. 5. Natural water sources can wholly **supply** the need for water in this town. 6. The term

"**well**" may not mean a dug or sunk **well** but a service pool **adopted** as a communal or regular water supply. 7. This kind of water distribution system cannot be **adopted** in this locality. 8. The possibility of contamination **became** evident **for** the community grew in population and the demand **for** water increased. 9. Industry replaces water **diverted** to its use. 10. The attention was **diverted** from this problem.

7. а) Укажите, какие из данных слов являются существительными и какие — прилагательными.

rainfall, natural, undersoil, gravel, disposal, palatable, essential, available, geographical, industrial, communal

б) Образуйте от следующих глаголов существительные, используя суффиксы '-tion', '-ion'. Переведите их.

locate, distribute, saturate, classify, connect, complete, pollute, situate, consume, populate, contaminate, create

8. Переведите 7-й и 8-й абзацы текста.

9. Ответьте на следующие вопросы не менее чем тремя высказываниями.

1. Why were man's earliest communities established close to natural water sources? 2. Why must natural water undergo treatment before consumption?

10. Опровергните следующие неправильные утверждения не менее чем двумя-тремя высказываниями каждое (см. упр. 14, с. 12).

1. Inland lakes are bodies of water formed by the evaporation of water.

2. Water is available in unlimited quantities in all parts of the earth.

IV — 2B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните значения следующих английских слов и подберите к ним русские эквиваленты из правого столбца.

project	1. компания
impracticable	2. фонтан
campaign	3. общественный
prototype	4. проект
fountain	5. кампания
public	6. декрет
primitive	7. регулярный
alternate	8. переменный; чередующийся
to train	9. тренировать(ся)

civilized	10. примитивный
regular	11. неосуществимый
decree	12. цивилизованный
company	13. бак
tank	14. цистерна
cistern	15. прототип

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

water distribution system водопроводная система
counterpart прототип, дубликат
water hole колодец
natural pool естественный водоем
intake водозабор
outlet сток, вытекание
alternate days через день
running water водопровод

3. Прочтите текст. Укажите абзацы, где говорится о трудностях водоснабжения в различных странах.

Text. From the History of Water Supply

(1) Water is power not only in the hydraulic sense, but in relation to progress and culture: campaigns as well as fortresses have been lost, projects rendered impracticable and communities have decayed for want of water.

(2) Nature has provided prototypes for most of man's devices and, just as the streams and rivers anticipated water distribution systems, so tanks, cisterns and reservoirs have their natural counterparts in water holes and natural pools.

(3) Long after man had found ways and means to organize water supplies, find them where they were hidden and lead them to where he wanted them, streams and pools in their natural state have served as communal water supplies, even in more or less civilized Europe.

(4) The 17th century marks the beginning of the new order in communal organization and in relation to water supply, the beginning of large-scale schemes.

(5) All through London's history until modern times, the question of water supply continued to be a problem. In the 18th century even with the appearance of larger water companies the water supply was far from being satisfactory. It was a usual practice at the time to lay on water for two hours every second day.

(6) Water drawn from the river Thames was in a state that was offensive to the sight as the intake was found to be only three yards from the outlet of a great sewer. As a matter of

fact it took 2 outbreaks of cholera to pass a Bill for an improved water supply in the middle of the 19th century.

(7) In spite of the progress made in the field of water supply in many countries, there is much to be done yet. In Asia, Africa, Central and South America outside the great cities, methods are primitive as ever they were; village ponds are still used in Africa and Asia for drinking, washing and bathing and as watering places for cattle, in Madagascar in recent years people have had to carry their water bottles several miles and, as some of them can only do the journey twice a week, they have trained themselves to do with the minimum of water, drinking only on alternate days and never washing during a drought.

(8) In Japan, running water is still a luxury, even in the great cities: the average household have to carry water from a central source, while the villages rely on springs and streams.

(9) The speedy industrialization of the Soviet Union has also made the problem of water very acute. The situation in this country would have been much worse were it not for a number of important measures undertaken by the Soviet Government immediately after the Great October Socialist Revolution. Our water resources were protected by the Decree on Forest signed by Lenin in May 1918.

At present the requirements of water supply in Moscow both for the people and industry are fully met by several water treatment stations. In our capital water consumption per capita is very high, namely, it is more than 500 litres per day.

Some projects of new water treatment stations are being considered to satisfy the growing needs of water in our capital.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Какие из данных предложений выражают основное содержание текста? Расположите их согласно последовательности изложения.

1. People began to build large-scale water projects only in the 17th century. 2. Water is one of the most important factors for the existence of a community. 3. In many parts of the Earth people suffer from insufficient supply of pure wholesome water. 4. Man's devices for water storage and distribution have their prototypes in nature. 5. Water taken from its natural sources—ground lakes or rivers—contains many harmful elements. 6. In the 18th and 19th centuries the problem of water supply in the metropolis of Great Britain was still very acute and the great city was constantly suffering from

the shortage of water supply. 7. Present day water consumers are used to constant water supply.

2. Укажите, какие из данных предложений отражают основное содержание текста и какие касаются деталей.

1. Water is one of the main factors in man's life. 2. Man copied nature when constructing water reservoirs and water distribution systems. 3. In many countries of Asia, Africa and Central and South America the methods of water supply are very primitive. 4. The intake of the water drawn from the river Thames was only three yards from the outlet of a great sewer. 5. The fast development of industry in the USSR has made the problem of water supply very acute. 6. Our state pays great attention to the preservation of natural water sources.

3. Дополните незаконченные предложения одним из данных вариантов (a, b, c) в соответствии с содержанием текста.

1. Nature has provided prototypes for most of man's devices, so...

a) water taken from lakes or rivers contains many harmful elements; b) streams and rivers anticipated water distribution systems; c) water resources must be protected.

2. Long after man had found means to organize water supplies...

a) in many countries there is much to be done in the field of water supply; b) we are now used to constant water supply; c) rivers, streams and pools in their natural state served as communal water supplies.

3. In Moscow the requirements of water supply are fully met, so...

a) some important measures were adopted to ensure its quality; b) it was necessary to design some new large-scale projects; c) the water consumption per capita is very high.

4. Составьте план к тексту из четырех предложений, прокомментируйте его на русском языке.

5. Прослушав текст, прочитанный преподавателем, скажите, какие факты из истории водоснабжения в нем упоминаются: а) относительно средневековой Британии; б) относительно г. Йорка.

IV — 3A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова. Используйте их для понимания текста.

result, residence, institution, products, operation, production, domestic, manufacture, combination, combined, process, method, sanitary, paste, disinfection, bacteria, chemicals

2. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

sewerage канализация
waste products продукты отхода
liquid жидкость
sewage сточные воды
refuse твердые отбросы, мусор
street slushing operations поливка улиц
domestic sewage бытовые (санитарные) сточные воды
industrial waste промышленные сточные воды
sewer канализационная труба (коллектор)
treatment plant водоочистное сооружение, станция по очистке
discharge сток (сброс) сточных вод
raw sewage необработанные сточные воды
primary treatment первичная обработка
sludge отстой, ил, осадок
clarified осветленный
decomposable способный к разложению
chemicals химикалии

3. Прочтите текст про себя. Укажите, какие основные темы освещаются в нем.

Text. Sewerage

(1) The problem of protecting natural water resources has grown very pressing for many countries since the beginning of the second half of the 20th century. The development of human society, the growth of civilization and social and technical progress have resulted in the changing of the composition of natural water resources. The rivers, lakes and ground-waters contain today a considerable amount of the products of mechanical, chemical and biological pollution.

(2) The waste products that result from the daily activities in a community are of two general types: namely, the liquid waste, known as sewage and the solid wastes, known as refuse. The different wastes of which sewage is composed are the following: the wastes from lavatories, baths, sinks, and laundry tanks in residences, institutions, and business buildings; certain liquid wastes from various types of manufaturing or industrial plants, and, in many communities, the surface run-off that results from storms or street-flushing operations.

(3) Sewage may also be divided according to its source into the following three classes. The sewage from residences, institutions and business buildings is called domestic sewage, sanitary sewage or house sewage; that resulting from manufacturing or industrial processes is known as industrial waste; and that from run-off during or immediately following storms is called storm sewage. A combination of domestic sewage, industrial waste and storm water is called combined sewage.

(4) Both sewage and refuse must be removed promptly in order to avoid endangering the health of the community and also present decomposition of the materials of animal or vegetable origin and the subsequent production of nuisances and odours.

(5) The removal of all kinds of sewage is usually accomplished by means of sewers. The sewers are placed in the streets at several feet below the ground surface. The general process of removing sewage is designated as sewerage and the entire systems of sewers including a sewage treatment plant is known as a sewerage system.

(6) The method of sewage treatment to be adopted in a particular case will depend almost entirely on local conditions. It may consist only of the discharge of the raw sewage into a stream or a large body of water. The usual methods of sewage treatment consist either of preliminary treatment alone or of primary treatment followed by secondary treatment.

(7) During primary treatment the larger and heavier solid particles settle out from the liquid. These solid particles that settle out form a slimy paste which is known as sludge.

(8) The partly clarified sewage that has been given primary treatment generally contains much decomposable materials. Therefore, further treatment which is known as secondary treatment, is usually required.

(9) An auxiliary treatment which may be used with either primary or secondary treatment is disinfection or the killing of the most of the bacteria in the sewage by means of chemicals.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какие из данных предложений выражают главную мысль текста.

1. Water taken from its natural source—the ground lakes or rivers—contains many objectionable elements. 2. The waste products that result from the daily activities in a community must be removed promptly passing through different methods of treatment. 3. The drains from a residence or office buildings are connected to a single underground pipe called a house sewer.

2. Какие из данных предложений выражают основное содержание текста? Расположите их согласно последовательности изложения. (Время — 5 мин.)

1. Both sewage and refuse must be removed promptly in order to avoid endangering the health of the people. 2. The methods of sewage treatment are different and depend wholly on local conditions. 3. Secondary treatment is required to remove decomposable materials from the sewage. 4. Sewage is composed of different types of wastes which result from the daily activities in a community. 5. Sewage may also be classified according to its source. 6. The removal of sewage is accomplished by sewers which are a part of a sewerage system. 7. The killing of bacteria in the sewage is accomplished by means of chemicals. 8. Heavier solid particles settle out from the liquid during primary treatment.

3. Укажите предложение (a, b, c), являющееся ответом на заданный вопрос.

Why must sewage undergo secondary treatment?

a) because sewage and refuse products result from daily activities in a community; b) because primary treatment is not sufficient as the partly clarified sewage still contains much decomposable material; c) because chemicals help to kill the bacteria in the sewage.

4. Составьте план к тексту из четырех пунктов.

5. Переведите предложения, обращая внимание на выделенные слова.

1. The waste products **that** result from the daily activities in a community are of two general types. 2. The sewage from residences is called domestic sewage, **that** from industrial processes is called industrial waste. 3. Sanitary conditions in the capital are much better than **those** in other cities of the same country. 4. It is known **that** the method of sewage treat-

ment depends on local conditions. 5. Hamburg was the first city that had a complete systematic sewerage system.

6. Определите по формальным признакам границы группы подлежащего; предложения переведите.

1. Sewage disposal systems serve to return the used water to the natural source. 2. In some localities an elaborate natural water treatment method is required for preparing drinking water. 3. At the present time modern water distribution system design has become a large engineering task. 4. Natural water resources protection is of primary importance nowadays.

7. Образуйте от следующих глаголов существительные, используя суффиксы '-tion' или '-ment'.

produce, treat, decompose, combine, accomplish, adopt, settle, disinfect

8. Переведите 3-й и 6-й абзацы текста.

9. Переведите письменно со словарем. (Время — 15 мин.)

Primary treatment may consist of one or all of the following processes: passing the sewage through a grit chamber, in which the sand or grit is settled out; screening or the removal of a portion of the coarse solids by passing the sewage through specially constructed screens or racks; and sedimentation, or the passing of the sewage through some type of settling tank, either with or without the application of chemicals, so that the larger and heavier solid particles settle out from the liquid. These solid particles that settle out form a slimy paste which is known as sludge.

10. Дайте не менее трех вариантов ответа на каждый из поставленных вопросов.

1. What is necessary for protecting the purity of natural water resources? 2. Why do large modern cities suffer mostly from water pollution?

11. Опровергните неправильные с точки зрения содержания текста высказывания не менее чем тремя предложениями (см. упр. 14, с. 12).

1. The problem of protecting natural water resources is of little importance as compared to other problems of our age.

2. After primary treatment polluted water may be used for drinking.

12. Прослушав текст, прочитанный преподавателем, укажите, к каким терминам относятся следующие формулировки.

a) It is the liquid, usually domestic wastes from a community.

b) It is the fluid flow along all pipes or open channels which takes liquid wastes or rain water.

c) Systems of pipes or drains which carry domestic or industrial wastes.

IV — 3B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова. Используйте их для понимания текста.

popular, dating, progress, basis, limit, metropolis, commerce, alley, reason, ruins, commission, era, drainage, technology

2. Прочтите и запомните значения следующих слов для лучшего понимания текста.

drains стоки
sanitation улучшение санитарных условий
lack отсутствие
execution выполнение
metropolis столица
junction соединение
cellar подвал
cesspool сточный колодец
inquire исследовать
management *зд.* благоустройство
odour запах
recipient приемник (приемный резервуар)
community населен. пункт
effluent вытекающий поток
contamination заражение

3. Прочтите текст. Определите, какие 4 основные темы освещаются в нем.

Text. From the History of Sewerage

(1) Man's sewerage practice has been known from ancient times. Explorations revealed sewers in Babylon * dating from the 7th century before our era. Considerable information is available about the sewers of Jerusalem,** works of this class in ancient Greek cities are fairly well known and the great underground drains of Rome have repeatedly been described.

(2) The history of the progress of sanitation in London probably affords a typical picture of what took place quite generally about the middle of the 19th century in the largest cities of Great Britain and the United States.

*Babylon ['bæbɪlən]
**Jerusalem [dʒə'ru:sələm]

(3) The lack of central authority rendered a systematic study and execution of sewerage work impossible. As late as 1845 there was no survey of the metropolis adequate as a basis for planning sewers. The sewers in adjoining parishes were of different elevation so that a junction of them was impracticable.

(4) The first engineer who made a comprehensive study of metropolitan sewerage needs thus described the conditions of London basements and cellars in 1847: "There are hundreds, I may say thousands of houses in this metropolis which have no drainage whatever and the greater part of them have stinking overflowing cesspools. And there are also hundreds of streets, courts and alleys that have no sewers." After 2 outbreaks of cholera a royal commission was appointed to inquire into sanitary improvements of London. In 1855 Parliament passed an act for the better local management of the metropolis which laid the basis for the sanitation of London.

(5) In the continent a marked progress in sewerage began in 1842 when a severe fire destroyed the old part of the city of Hamburg. The portion ruined was the oldest and it was decided to rebuild it according to the modern ideas of convenience. As a result Hamburg was the first city which had a complete systematic sewerage system throughout built according to modern ideas. The system proved so well designed and maintained that twenty-five years after the sewers were completed they were found by a committee of experts to be clean and almost without odour.

(6) At the present time the problem of good sanitation is closely connected with that of protecting the purity of natural water reservoirs, since often the same body of water must serve both as a source of water and as a recipient of sewage and storm drainage. And it is this dual use of water in nature and within communities and industrial premises that establishes the most impelling reasons for water sanitation.

(7) The source of pollution lies largely in the effluents of industry, urban life, agricultural production and transport, the worst pollution being caused by the chemical industry. Modern agriculture which utilizes huge quantities of chemical fertilizers also pollutes the ground-waters and rivers.

(8) Despite the growing improvement in water treatment methods many regions of the world cannot cope with the rapid rate of water contamination. The highly industrialized countries naturally suffer more than others. Certainly the conditions which existed only a century ago cannot be restored in

present or future large cities. But we badly need to find new ways of using the water in industry and agriculture and of radically improving the technology of drainage purification.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Какие из данных предложений выражают основное содержание текста? Расположите их согласно последовательности изложения. (Время — 5 мин.)

1. The progress of sanitation in London did not keep pace with the growth and development of the city. 2. Man built sewers in ancient times. 3. The first steps to study sanitary conditions in London were made in the first half of the 19th century. 4. Public health depends to a large extent on good sanitary conditions in a community. 5. Rapid industrialization calls for new, more elaborate water treatment methods. 6. The problem of good sanitation and that of protecting the purity of natural water reservoirs are mutually dependent. 7. Progress in sanitation in the European continent started only as late as the second half of the 19th century. 8. Industry causes the worst water pollution. 9. Today rivers, lakes and ground-waters contain considerable amounts of the products of mechanical, chemical and biological pollution. 10. Both sewage and refuse must be removed promptly. 11. The lack of an adequate survey of the capital made planning and execution of sewerage work impossible.

2. Укажите, какие из данных предложений отражают основное содержание текста и какие касаются деталей.

1. The progress of sanitation in London was typical for the largest cities of Great Britain and the United States. 2. There were hundreds of streets in London in the 19th century that had no sewers. 3. Much information is available about sewers built in ancient times. 4. Highly industrialized countries suffer greatly from the rapid rate of water contamination. 5. Hamburg had a sewerage system built according to modern ideas of convenience. 6. The sewers in adjoining parishes in London were of different elevation. 7. Great underground drains were built in ancient Rome. 8. An act of Parliament for better local management of the metropolis laid the basis for the sanitation of London.

3. "Memory test". Восстановите по памяти (на русском языке), в каком контексте упоминаются следующие английские словосочетания.

1. the source of pollution lies largely
2. in 1842 ...
3. thousands of houses have no drainage whatever

4. Сравните порядок слов в вариантах a) и b). Скажите, как изменился смысл предложений. Переведите предложения на русский язык.

a) The dual use of water in nature and within communities and industrial premises establishes the most impelling reasons for water sanitation.

b) It is the dual use of water in nature and within communities and industrial premises that establishes the most impelling reasons for water sanitation.

РАЗДЕЛ V

ENERGY AND ITS SOURCES

V — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

serious, problem, potential, energy, transportation, technological, industrialization, to classify, material, million, to associate, expansion, natural, gas, result, resources, reserves, popular, form, generator, logical, alternative, electricity, extravagant, efficiency, finally, reaction, reservoir, turbine, standard, total, period, to utilize, to dam, solar

2. Вспомните значения следующих английских слов и словосочетаний, знакомых вам из предыдущих текстов.

convenience, recreation, to meet the needs (demands), standard of living, according to, main, wood, earth, to use, use, useful, development, heating, raw materials, natural resources, long-range (long-term), available, to solve, century, rapidly, comparison, increase, urgent, to utilize, to expect, to grow, so-called, shelter

3. Прочтите и запомните значения следующих слов и словосочетаний для лучшего понимания текста.

face стоять перед
shortage недостаток, нехватка
consumption потребление
consume потреблять
amount количество
relate иметь отношение к
origin происхождение
deposited отложенный
oil нефть
fossil fuel ископаемое топливо
store накапливать, содержать

waste бесполезная трата
generation производство, выработка; поколение
extraction извлечение
radiant лучистый
solution решение

4. Переведите следующие словосочетания.

living standard; of plant and animal origin; coal usage; long-term (long-range) demands; water motion; radiant energy; at such a rate; energy problem; nuclear energy; nuclear reaction; nuclear reactor; nuclear fuel; nuclear power plant; fossil fuel

5. Прочтите текст и назовите все источники энергии, которые в нем рассматриваются.

Text. Energy and Its Sources

(1) The world is facing a serious problem of potential shortage of energy, which is extremely important to meeting all of man's physical needs—clothing, shelter, transportation, convenience, recreation, etc.

(2) The consumption of energy is expected to grow. The amount of energy consumed by a country is closely connected with its degree of technological development and industrialization, which are in turn related to the people's standard of living.

(3) Energy can be classified according to its sources. The principal materials now used for obtaining energy are of plant and animal origin, deposited in the earth over millions of years in the form of coal, oil, and natural gas. These so-called "fossil fuels" are extremely useful raw materials because of the conveniently stored chemical energy. But when they are burned for fuel, harmful pollution may result and there is a great waste of natural resources that will never be available again.

(4) Wood was already the main source a hundred years ago. The growth of coal usage in the early 1900s is associated with rapidly increasing industrial development. There followed a great expansion in the consumption of natural gas and fuel oil for heating, electrical generation and especially transportation.

(5) The reserves of such popular sources of energy as natural gas and oil are not expected to meet the long-term demands.

Natural gas is a popular source of energy because of its convenience for use and cleanliness in burning. It is generally believed that gas will be the first fossil fuel to be in short supply, and the cost of oil extraction is high.

(6) To these sources we can add the energy obtained from water motion and the sun.

Hydroelectric power is available when a stream can be dammed to form a large reservoir, permitting falling water to turn a hydraulic turbine connected to an electric generator. It is generally agreed that this source cannot meet the total need in power.

(7) Solar power is often mentioned as the logical alternative. And indeed, the amount of radiant energy that reaches the earth's surface is more than what is needed. For the generation of electricity, however, there are serious problems to be solved. To collect and concentrate the energy by reflectors and converters of present efficiency is the major difficulty. There remain many technological problems in this area.

(8) Man is consuming the remaining resources at such a rate that they may last only a few centuries. This may seem to be a long time in comparison with the life of a single generation, but in man's history it is only a short period. If the world is to solve the long-range energy problem, it must look for and make use of all available practical sources economically. Efforts to eliminate the extravagant waste of energy are needed at the same time.

(9) Several other conclusions can be made: that research and development work with a view to find new sources of energy and ways of increasing efficiency are urgently needed; that the new sources of other types of fuels must be fully developed and utilized wherever possible. And we must give a serious consideration, as a possible solution, to nuclear energy, i.e. the energy from nuclear reactions, the burning of nuclear fuel.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Определите, в котором из значений данные слова употреблены в тексте.

1. to face (1) — смотреть в лицо; облицовывать; стоять перед;
2. in turn (2) — по очереди; в свою очередь; со своей стороны;
3. generation (4) — поколение; производство; образование; добыча;
4. power (6) — мощь; сила; энергия; власть; держава;
5. extravagant (8) — экстравагантный; расточительный; непомерный;
6. development (9) — развитие; застройка; расширение; рост;

7. oil (3) — масло; нефть;

8. plant (3) — установка; завод; растение;

9. to relate (2) — рассказывать; иметь отношение; относиться;

10. wood (4) — лес; дерево; дрова;

11. waste (3) — отбросы; бесполезная трата; растрачивание;

12. origin (3) — источник; происхождение; начало

2. Укажите, какие из данных утверждений освещаются в тексте.

1. In the near future most of the electrical supply will come from nuclear sources. 2. The available sources of energy must not be wasted. 3. To collect and concentrate solar energy by reflectors and converters is the main difficulty. 4. The available sources of energy will not last long. 5. The technological development demands more and more energy. 6. High radioactivity may make the operation of a reactor dangerous.

3. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. To solve the problem of energy shortage...

a) the consumption of energy should grow; b) there should be no extravagant waste of energy; c) man uses energy to meet the needs of life.

2. In future the consumption of energy will grow...

a) because the remaining resources will last for ever; b) due to the further industrial development; c) and the products of burning pollute the atmosphere.

3. So-called "fossil fuels"...

a) can last for ever; b) have been formed in the earth over millions of years; c) are a result of chemical reactions in a reactor.

4. Man must discover and use sources other than fossil fuels...

a) because solar energy can provide electricity for desalinization of sea water; b) and nuclear energy can meet the world's needs in fuel; c) for they are extremely useful natural resources.

4. Составьте план к тексту из 6 предложений, прокомментируйте его на русском языке.

5. Переведите предложения, обращая внимание на перевод инфинитива.

1. The consumption of energy is expected to grow. 2. The supplies of coal, natural gas and oil are said to be limited.

3. Nuclear energy is believed to be the solution of the energy problem. 4. Fossil fuels such as natural gas, oil and coal are not expected to meet the long-term demands in fuel. 5. Fossil fuels are known to have been used very long and have become limited. 6. Solar energy is thought to be a solution of the energy problem.

6. Переведите данные предложения, содержащие инфинитив в качестве определения.

1. For collection and concentration of solar energy by reflectors and converters there are serious problems to be solved. 2. We have nuclear energy to be given serious consideration. 3. There may still be other sources of energy to be found as solutions to the problem of energy shortage. 4. There are many factors to determine the necessity to supply electricity from nuclear sources. 5. The pollution that results from burning fossil fuels is a factor not to be ignored. 6. With the use of nuclear fuels there will be a number of problems to consider. 7. The reflectors and converters to be designed to collect solar energy have been quite a difficulty.

7. Сгруппируйте слова с одним корнем и переведите их.

needs, convenience, shelter, consumption, development, technological, to need, convenient, growth, natural, to shelter, to consume, electrical, generation, nature, to use, to develop, urgent, to grow, technology, electricity, to generate, useful, conveniently, result, finally, to dam, to result, uselessly, dam, final, urgently

8. Опровергните двумя-тремя предложениями следующие неправильные утверждения с точки зрения содержания текста.

1. With future development of technology, world population may need less energy. 2. The supply of fossil fuels—coal, oil and natural gas—is unlimited for they are natural resources. 3. Solar energy demanding solution of techohlogical problems is believed to solve all the present and future problems of shortage of energy. 4. The future of energy supply in the USSR must be based on fossil fuels, which is a solution to consider.

9. Переведите 8-й и 9-й абзацы текста.

10. Ответьте на следующие вопросы к тексту.

1. What is the problem that the world is facing? 2. Why is the energy consumption expected to grow? 3. What materials

are mainly used for energy generation at present? 4. Of what origin are they? 5. When were wood and coal the main energy sources? 6. Why are fossil fuels harmful to use? 7. How long are reserves of natural gas and oil expected to last? 8. How is hydroelectric power generated? 9. Is solar power costly? 10. How long may the existing energy resources last? 11. What are the conclusions that must be made? 12. Can nuclear energy be considered the energy of the future?

11. Перескажите текст не менее чем 6 предложениями на английском языке.

12. Прочтите текст про себя за 6 мин. и найдите ответ на следующий вопрос: Where and how can solar energy be used?

Solar Technology Without Exotic Elements

Contrary to what we think, water is not only present in the desert but in great quantities too. Whole seas are sometimes there under sands. But most often this water is salty and cannot be used for drinking. So it has to be lifted and desalinated.

The sun's rays can be used to operate a special turbine developing about half a kilowatt. Half a kilowatt seems very little. But it is quite a lot in the desert, for it means about two cubic metres of water lifted from a considerable depth, and water means life.

When we think of solar energy and its future, we imagine exotic things. But solar technology is not only great reflectors and concentrators as many people think, it is also such simple things as a turbine producing drinking water.

Besides there can be simple solar water heaters which make hot water available in the coldest conditions. Houses can be heated by the sun in winter and cooled in summer.

Creation of solar technology is not only a technical engineering problem but also a social one. Making our distant desert lands possible to live in is a dream scientists are working to realize.

13. Прослушав текст, прочитанный преподавателем, дайте ответы на следующие вопросы.

1. What device is described? 2. What is it used for? 3. What energy is it run on?

V — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

limited, base, hydroelectric, to extract, nature, factor, construction, confusion, opponent, critical, reason, controlled, reactor, to accompany, to convert, principle, safe

2. Вспомните значения следующих английских слов и словосочетаний, знакомых вам из предыдущих текстов.

energy consumption, energy supply, fossil fuel, solar power, to require, source of energy, sufficient, pollution, nuclear energy, energy needs (demands), to face, rapidly, power plant, steam, heat, coal, oil, to obtain, to take place, reactor core

3. Прочтите и запомните значения следующих слов для лучшего понимания текста.

rapid быстрый
tide прилив, отлив
benefit польза
challenge вызов
existence существование
prediction предсказание
cost стоимость
demand спрос, требование
conventional обычный
device механизм
various различный
processing переработка
disposal удаление
to force заставлять

4. Прочтите текст. Определите, как можно решить проблему недостатка энергетического сырья.

T e x t. Nuclear Energy

(1) A very rapid growth of energy consumption has occurred in the twentieth century.

A major problem is that much of the world's energy supply is based on fossil fuels. Fossil fuels are limited and their supply is running out. From this it follows that the future of our energy supply must be based on sources other than fossil fuels like coal, oil and natural gas.

(2) Hydroelectric, wind, tidal and solar power require much technological development. New and different sources of energy have to be found and brought into practical use. The problem consists in developing technology to extract energy from nature without causing air, water, thermal or radioactive pollution. The wise use of nuclear energy, based on an understanding of both dangers and benefits, will be required to meet this challenge to our existence.

(3) In the near future about half of electrical supply is expected to come from nuclear sources. There are many factors that will determine the accuracy of this prediction. It is noted that the cost of construction of a nuclear plant is high but the fuel cost is relatively low.

(4) Yet there is considerable confusion in the public mind when it comes to nuclear power plants. There are those who consider it to be a major solution to the world's energy needs. There are opponents with good reason to be critical. In either case we are faced with the rapidly increasing energy demands of the future.

(5) A nuclear power plant is very much like a conventional steam power plant. The only difference is that the heat used to run the electric generator is not obtained by burning coal, gas, or oil but from controlled nuclear reactions.

A nuclear reactor is a device in which these reactions take place.

(6) There are various types of nuclear reactors. All of them operate more or less on the same principle. Yet we always face the fact that the use of nuclear energy requires safe transportation, processing, storage, and disposal of potentially dangerous materials. However the dream of limitless power will force mankind to find solutions to all these problems for the satisfaction of man's needs.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Сверяясь с текстом, укажите то из приведенных словарных значений, в котором данное слово употреблено.

1. major (1) — майор; мажор; более важный; старший;
2. to run out (1) — выбегать, работать, управлять, истекать, истощаться;
3. to extract (2) — удалять, выжимать; извлекать корень; добывать;
4. nature (2) — характер; нрав, натура; природа;
5. confusion (4) — беспорядок, смущение; путаница;
6. reason (4) — разум; причина, довод; основание;
7. case (4) — ящик; футляр; случай;
8. good (4) — добрый; хороший; обоснованный
9. mind (4) — мысль, ум, мнение, память

2. Укажите, к каким абзацам текста могут служить заголовками данные предложения. Расположите их согласно последовательности изложения. (Время — 5 мин.)

1. The present sources of energy and the problems we face.
2. A power plant operating on a nuclear fuel.

3. Nuclear energy and the problems it causes.
4. The present necessity of new energy sources.
5. The factors determining the use of nuclear energy.

3. Укажите, в каких абзацах текста даются ответы на данные вопросы. Ответьте на них.

1. Where do nuclear reactions take place? 2. What fossil fuels are used at present? 3. What is the use of nuclear energy based on? 4. What are the energy sources of the future? 5. What happens to the heat generated by a reactor? 6. What is the main problem of our century? 7. Does everybody regard nuclear power a solution to the energy problem? 8. Is a nuclear power plant something radically new?

4. Закончите предложения с учетом содержания текста.

1. Sources other than fossil fuels must be found because... 2. Energy must be extracted from nature but... . 3. Operation of nuclear power plants involves the following activities... 4. The power to run the electric generator in a nuclear power plant is obtained... . 5. A nuclear power plant is just like a steam power plant as...

5. Прочтите текст и расскажите о практическом применении радиации.

Many important economic and social benefits are derived from the use of radio isotopes and radiation. Applications of radiation are found in industry, medicine, agriculture as well as in space exploration.

The oldest and best known use of radiation is for medical diagnosis by X-rays. They penetrate the man's body to different degrees and shadows of bones and other materials appear on a photographic film.

In industry a fabric can be made soil-resistant, a new type of wood and tiles can be produced.

Radiation finds application in crime investigation, in agriculture for selection of better seeds and for food preservation.

The probable age of a piece of art can be determined by testing the paint.

Radiation methods can be of great benefit to history, archeology and anthropology as well, since they can be used to establish dates and events. The determination of the age of minerals in the earth, in meteorites, or on the moon can also be made. The technique is of particular interest in determining the date of the first appearance of man.

6. Переведите письменно со словарем. (Время — 30 мин.)

The discovery of nuclear reactions that yield energy, radiation, and radio isotopes is generally regarded as one of the most significant scientific contributions of the twentieth century in that it showed the possibility of enormous human benefit or of world destruction.

Every natural resource has mixed good and evil. For example, fire is necessary and welcome for giving warmth to our homes and buildings but can destroy our forests. Water is necessary for every living being but in the form of a flood it can ruin our cities and land. Drugs can help cure diseases but can also be evil or even kill us. Explosives are valuable in mining and construction work but are also a tool of warfare. Just as it is the case with nuclear energy—on the one hand, we have benefits of heat and radiation for many human needs, on the other, the possibility of bombs and radioactive fallout.

The key to application for either good or evil very often lies in man's decisions. He must take full advantage of good uses. Urgent national and world problems can be solved by wisdom and cooperation.

РАЗДЕЛ VI

WATER-POWER DEVELOPMENT—INTEGRAL PART OF CIVIL ENGINEERING

VI — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова:

barrier, complex, series, effect, realize, proportion, aspect, stability, reality, irrigation, navigation, decade, to form, final, to associate

2. К каким из следующих английских слов русскими эквивалентами являются слова:

executed	1. десятилетие
complex	2. образовать
barrier	3. сложный
to realize	4. меньший
aspect	5. орошение

stability	6. сторона (*проблемы*)
irrigation	7. устойчивость
minor	8. преграда
decade	9. понимать
to form	10. выполненный
proportion	11. часть
to associate	12. связывать с

3. Прочтите и запомните значения следующих слов для лучшего понимания текста.

reservoir водохранилище
dam плотина
flood паводок
control регулировка, контроль
development *зд.* гидроузел
lock шлюз
to discharge сбрасывать
impervious водонепроницаемый
to impound запрудить
head напор
generation выработка (*энергии*)
stability устойчивость
safety надежность
property свойство
failure разрушение
treatment обработка
pumped-storage station аккумулирующая ГЭС

4. Прочтите текст про себя. Укажите, в каких абзацах освещается роль плотины как одного из компонентов гидроузла.

Text. Water-Power Development—Integral Part of Civil Engineering

(1) With the growth of towns and their industries, with the increase of population and the improvement of living conditions the demand for water rises rendering the work of water power engineers ever more important.

(2) There are so many uses for river water that it seems natural it is always made to serve more than one purpose. A large reservoir formed by the dam may be used for flood control, for improving industrial and domestic water supply for nearby areas, for irrigation and navigation, for recreation and sport. To accomplish such miscellaneous tasks a hydropower development built on the river should comprise besides the dam such structures as a power station, navigation locks, spillway facilities, and canals and tunnels for discharging floods, and other ancillary structures of minor importance.

(3) In harnessing a river to make it serve the man a dam, an impervious barrier should be placed in its way, which impounds water and raises the level of the river thus creating the head necessary for power generation. Since dams are to withstand various stresses, much thought should be given to

the problems of increasing their strength, watertightness, stability and safety. It becomes all the more important nowadays as the heights of dams have steadily been increased and the 1960s will go down in history as the decade when the dam of around 200-300 m in height became a reality. The fact calls for a drastic improvement of the methods of design and a deeper knowledge of the foundation character and the properties of the materials used.

(4) Well executed, the dam is of great benefit to the community but if it is not, a dam failure is, perhaps, the most serious man-made catastrophy likely to occur in the peace time. The disasters that took place showed that the mechanism of a dam failure is very complex, that a whole series of effects occur in quick succession. The determination of the true state of stress in a dam undertaken so far now requires a more elaborate treatment as people have come to realize that the best of theories is useless if the materials used do not comply with the assumptions made about their properties.

(5) Modern industrial growth should not be threatened for want of electric energy and this calls for providing better use of resources of various sorts to attain maximum technical and financial efficiency.

Thus the idea of a pumped-storage station using small rivers or basins appeared. As the name implies, the principle of its operation demands storing water in an upper basin and then directing it into a lower basin where from the water is pumped back into the upper basin to repeat the cycle. The scheme demands a special kind of machinery—a reversible pump-turbine type. The station of this kind readily covers peak energy periods and is most efficient when combined with some other type of power plant.

In some countries for lack of any more economically exploitable water power development sites some proportion of the new power demand will be covered by nuclear stations.

(6) Nuclear, conventional thermal and hydropower plants are complementary, but not mutually exclusive. The problem of high load factor and peak load demands is to be solved by coupling nuclear stations, providing base load energy, with hydropower plants dealing with the peaks.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Соедините слова из двух колонок, образуя термины; переведите их.

flood	water
navigation	plant

to impound	failure
load	lock
peak	generation
power	factor
dam	control
power	load

2. Укажите, какое из данных предложений выражает главную мысль текста. (Время — 5 мин.)

1. Power generation may be accomplished by thermal and nuclear power stations. 2. River harnessing serves many purposes through building a hydropower development comprising a strong and stable dam. 3. The dam forms a reservoir which contributes to meeting the needs of different fields of human life.

3. Укажите, какое из данных предложений (a, b) уточняет следующие утверждения.

1. Harnessing a large river contributes to meeting the needs of the community.

a) The demands for water rise making the work of a water power engineer still more important. b) By building a hydropower development opportunities for irrigation, water supply, navigation and power generation are created.

2. The determination of the true state of stresses in the dam and its foundation should be considerably improved.

a) A hydropower development comprises many structures, among them a dam, withstanding great loads. b) Only well-designed and well-built dams are of benefit to man; their failures have most damaging effects.

4. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. Dams are placed across the river for...

a) creating a reservoir and generating electric energy; b) impounding water, raising the level of the river for creating the head; c) building a water-power station.

2. Improvement in the methods of dam design is needed as...

a) a large reservoir is formed by the dam; b) a hydropower development comprises various structures; c) the modern heights of the dams increase the stresses they withstand.

3. The dam is of great benefit to the community for...

a) its height is steadily increased; b) it makes the river serve many purposes; c) the design of the structure should be improved.

5. Укажите, какое из предложений (a, b, c) является ответом на поставленный вопрос.

1. What should be done before making a choice between a thermal and a water-power stations?

a) Full technical as well as financial aspects should be thoroughly examined, taking into consideration the local conditions. b) Resources of various sorts should be used for power generation. c) Thermal power stations demand smaller capital investment as compared to water-power stations.

2. How does a dam help in power generation?

a) The dam forms a reservoir which serves many purposes. b) By impounding the river water the dam creates the head necessary for power production. c) The dam is one of the structures which a hydro-electric development comprises.

3. What responsibility do the modern high dams lay on the designer?

a) Modern high dams impound large masses of water. b) With the height increase, methods of design should be more accurate, the investigation of the foundation character and the materials used should be improved. c) Modern dams are as high as 250-300 m and they create an adequate head.

6. Закончите предложения, добавив термин, определяющий назначение плотины.

Образец: The dam forming a reservoir raises the level of the river. Thus it creates **the head.**

1. The dam helps to prevent river waters in spring and autumn from covering large areas of fields and villages. Thus it provides... 2. The dam contributes to improved delivery of water to towns and cities, houses and enterprises. Thus, it provides better... 3. The dam helps to develop agriculture as it stores masses of water, which can be used in the fields in the dry seasons. Thus, it provides... . 4. The dam helps to use the power of water to produce electric energy. Thus it provides....

7. Составьте план из четырех пунктов по теме: "The Dam, its Functions and Design".

8. Подберите к русским словосочетаниям английские эквиваленты.

сооружения второстепенной важности	1. for lack (want) of
зарегулировать реку	2. do not comply with the assumption
для сброса паводка	3. to decide in favour of
из-за недостатка	4. to be of benefit to

не соответствует предположениям
решить в пользу
выдерживать напряжения
нужно как следует подумать о
на благо
гидроузел должен включать

5. much thought should be given to
6. to withstand stresses
7. for flood discharging
8. a development should comprise
9. structures of minor importance
10. to harness a river
11. in the name of

9. Определите границы главного и придаточных предложений и переведите предложения на русский язык.

The determination of the true state of stresses in a dam undertaken so far, now requires a more elaborate treatment as people have come to realize that the best of theories is useless if the materials used do not comply with the assumptions made about their properties.

10. Используя союзы which (который), as (так как), thus (таким образом), since (так как), соедините следующие короткие предложения, внося соответствующие изменения.

1. The dam blocks the river. It forms a reservoir. It can be used for various purposes. 2. The water impounded by the dam creates great stresses. The dam is to withstand them. 3. The heights of the dams have been increased. The intensity of stresses has grown as well.

11. Переведите 2-й и 3-й абзацы текста.

12. Укажите, какие утверждения противоречат содержанию текста. Опровергните их (см. упр. 14, с. 12).

1. Large rivers may serve only one purpose, that of water supply. 2. The method of dam design should be improved since the great heights of the structure increase the stresses. 3. A power station is built to harness a river. 4. The dam is placed along the river, thus the stresses it withstands are of major importance. 5. Different kinds of power stations are not mutually exclusive but they may be coupled. 6. A deeper knowledge of the foundation character and the properties of building materials is essential in obtaining the structure safety.

13. Дополните следующие предложения не менее чем двумя-тремя предложениями, развивая выраженную мысль.

1. The pumped-storage station generating power at peak energy periods differs from the conventional hydrostations in at least three aspects which are...

2. To assure the security of the dam the designer should provide the main properties of the structure each of which may otherwise have the following consequencies...

14. Переведите устно со словарем. (Время — 14 мин.)

Tides as well as waves are renewable sources of energy and at present their utilization to generate energy is becoming common. In the USSR the first tidal plant was built in Kislayagubsk Bay in the Barents Sea, whose construction had some special features, among them floating foundation that was used for the first time here; the plant itself was built in a dock and then taken by sea to the permanent site.

This power station has been successfully operating and at the same time it serves as a testing ground for various studies and tests. Thus, the Guidroproject Institute bases its design of a new tidal power station on the experience gained at it. This time the station is to be built at Penzhina Bay in Kamchatka, the Far East. The location selected for the site is known for the country's highest tides averaging about 7 m and reaching 13.5 m in places. The bay has a narrow range essential for building a tidal plant which is to be of great capacity.

15. Переведите следующие предложения, обращая внимание на выделенные слова.

1. The mechanism of dam failure is very **complex.** 2. A whole **complex** of stresses is created inside the dam. 3. The fuel **cost** of the thermal power station is very high in comparison with a hydro-electric plant. 4. Structures in the sea **cost** much. 5. These words should be written in **capital** letters. 6. **Capital** investments are rather high with hydro-electric stations. 7. He was **examined** by the head of the department. 8. The state of stress was **examined** using the apparatus data.

16. Сгруппируйте слова с одним и тем же корнем; переведите их.

to assume, decision, to solve, real, to create, various, to exploit, solution, reality, assumption, to decide, to realize, creation, to vary, exploitable, variable, decisive, assumed, beneficial, variety, benefit

17. Ответьте по-английски на данные вопросы.

1. Why is the dam an important part of a hydropower development? 2. Why should the methods of the design be im-

proved? 3. Why should different types of power stations be complementary, but not mutually exclusive?

18. Внимательно прочтите данный текст. Опишите основные моменты на русском языке. (Время — 5 мин.)

In 1963 the greatest known disaster occurred in Northern Italy. A large landslide over a mile long and a mile wide fell down into the reservoir of the dam. In about 30 seconds it completely filled the reservoir and, as a result, a huge wave of displaced water 100 m high was formed and it passed over the dam flooding and destroying everything in its way downstream.

The catastrophe took only a few minutes and the seismic effect caused by this landslide was recorded over a wide area in Europe. In spite of the fact that the water pressure reached millions of tons and, of course, much exceeded the design values the dam withstood it without any damage. This proved once more the structural strength and stability of the arch dam. At the same time this event emphasized the critical importance of thorough geological studies not only of the rock at and near the dam itself but also of surrounding valley slopes.

19. Внимательно прослушайте текст, прочитанный преподавателем, и, сопоставив его с текстом упр. 18, выделите сходство (6 моментов) и различие (4 момента) двух описанных событий.

VI — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

practicable, based, contribution, concern, hydraulic, mode, operation, fundamentally, progress, generator, to utilize, model, electronic, hydrodynamics, calculations, modernization, to simulate, materially, transformation

2. Следующие английские слова вызывают неправильную аналогию с русскими словами. Например, слово contribution означает «вклад», а не «контрибуция». Учитывая это, переведите выделенные словосочетания, пользуясь словарем.

great concern with water supply to cities; **mode of operation** of the turbine; the **model simulates** the real stresses in the structure; **the transformation** of old stations; the heights of the dams have **materially** been changed, accurate design is necessary

3. **К следующим русским словам подберите английские эквиваленты из правого столбца.**

близлежащий	1. water power engineer
водонепроницаемость	2. demand for
гидроэнергетик	3. to impound
спрос на	4. failure
шлюз	5. associated
водослив	6. executed
запруживать	7. stability
уровень	8. to go down in history
устойчивость	9. steadily
неуклонно	10. to withstand
войти в историю	11. to occur
выполненный	12. to call for
разрушение	13. level
связанный	14. to comprise
происходить	15. watertightness
требовать	16. nearby
включать	17. spillway
	18. to harness
	19. lock

4. **Прочтите текст. Определите, какие четыре основных вопроса освещаются в нем.**

Text. From the History of Dam Construction

(1) Dams have a history just as long as such branches of civil engineering as bridge building, road construction and the laying down of canals. Not only do dams represent some of the most impressive achievements of engineers over the centuries but their vital role in supplying water to towns and cities, irrigating dry lands, providing a source of power and controlling floods is more than sufficient to rank dam building among the most essential aspects of man's attempts to harness, control and improve his environment.

(2) In antiquity dams were built as an essential part of the need to practice irrigation on which the production of food was based. It was not until the Romans came on the scene that the size of dams was increased and new uses were found, such as the application of dams to problems of flood control and protection. The most important contribution, however, was the reservoir dam which, to a large extent, was a result of the Roman's concern with the water supply to cities and towns. That they were able to build so many big dams, many of which have lasted for a very long time and survived, despite

eighteen centuries of use and neglect, was also a result of their evolving better methods of construction based on better materials, especially hydraulic mortar and concrete. Moreover, proper attention was paid to hydraulic problems to ensure that the water could not percolate through the dams and that when it overflowed them, spillways were provided.

(3) The Industrial Revolution contributed to the further development of water resources not only for water supply purposes but also for water wheels, and, later, in the 19th century, for their logical successor—water turbines. In their mode of operation, particularly that of reaction turbines, it was a fundamentally new idea whose progress was closely linked with an improved understanding of hydrodynamics. The development of electric generators refers to the major scientific discoveries in the early part of the century, and one feature of electric power was of supreme significance, namely, that it is the only form of energy in a ready-to-use state which can be transmitted over long distances.

(4) One of the greatest advantages of a water-power station is that it utilizes an energy carrier which renews itself constantly and does not exhaust energy resources. This makes its maintenance costs relatively low.

(5) With the discovery of a generator three separate seemingly diverse branches of engineering, those concerning dams, water turbines and electric generators, came together to found a new branch of power generation utilizing hydropower resources. All the three elements have undergone changes in the height, volume and efficiency.

This progress places still greater responsibility on designers and engineers for ensuring durability and safety of the structures. The application of new devices—structural models and electronic computers—for stress analysis, research and calculations are of great help. The electronic computers handle the lengthy and time-consuming computations quickly and accurately. Model analysis, a technique for simulating the complex behaviour of a structure, a dam, for instance, promotes a reliable forecast in designing new schemes and in the transformation and modernization of the old ones to increase their efficiencies.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. В соответствии с текстом дополните незаконченные предложения одним из данных вариантов.

1. The water-power station has some advantages over other types of power plants, one of them is that...

a) improved understanding of hydrodynamics resulted in developing reaction turbines; b) it provides a source of power; c) it does not exhaust energy resources and its energy-carrier renews itself.

2. Dams built by the Romans have survived because...

a) they applied dams for flood control and protection; b) they developed better methods of construction and stronger building materials; c) new uses were found for dams.

3. Greater reliability of the dam design has become possible due to...

a) modernization of the old dams; b) application of structural modelling and more accurate analysis; c) the increased height and volume of dams.

2. Укажите, какие из данных предложений не соответствуют содержанию текста.

1. There are various types of dams, depending on the materials used and the methods of their construction. 2. The Romans used the dams for the purpose of water supply and took great care to ensure a long and safe life for the structures. 3. A hydropower development comprises several structures serving various purposes in harnessing the river. 4. The Greeks widely practiced irrigation and built dams for this purpose. 5. The fact that many dams built by the Romans have survived proves that their methods of construction and the materials used were to a great extent more elaborately developed. 6. Water turbines have a longer life than steam turbines. 7. In developing a reaction turbine better understanding of hydrodynamics was of great importance.

РАЗДЕЛ VII

PORTS—MEANS OF OUTSIDE COMMUNICATION

VII — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова. Используйте их для понимания текста.

location, prospect, position, commercial, expansion, modernization, to guarantee, operation, piers, provision, liner, transportation, container

2. Вспомните значения следующих английских слов.

advantage, favourable, convenient, shape, availability, to weigh, capable of, to double, dimensions, to accelerate, extensive, mention, continuity

3. Прочтите и запомните значения следующих слов для лучшего понимания текста.

laying out компановка
harbour гавань, порт
wharf пристань
quay пристань
pier пирс
jetty причал
shore берег
retaining wall подпорная стенка
vessel корабль
accommodate вмещать
cargo handling обработка грузов
storage склад, хранение
offshore structures морские сооружения в открытом море

4. Прочтите текст. Определите, в чем заключается основное различие типов причальных сооружений.

Text. Ports—Means of Outside Communication

(1) Historically ports sprung up at locations of geographic advantage and most favourable position for trade and prospects for future industrial development. River or sea routes promote a convenient means of transportation for cargoes, building materials, coal and oil, consumption goods and passenger traffic. There is a mutually beneficial influence of the growing port and the developing town.

(2) The points claiming the foremost attention in laying out the port are: most convenient position, most suitable shape of the harbour and the availability of transport routes to keep the port busy. The valuable experience gained by designers in building marine structures has to be weighed against the commercial justification for this or that project. The design has to be flexible and capable of being modified under various circumstances.

(3) Main port structures for landing are wharves or quays, piers or jetties. The former are built parallel to the shore and are continuous structures mostly acting as retaining walls used for berthing vessels on one side. A pier or jetty, unlike a quay, projects into the sea providing an opportunity of both-side berthing, thus doubling the berthing space for the same length of a wharf. Types of piers and their dimenions are various. The longer the pier, the wider it must be, and the width of basin must correspondingly be great to accommodate

two vessels readily, one at each pier, and also give room for the entry and departure of either.

(4) With the expansion of world trade there is an everpressing need to accelerate the speed of the ship turn-round, which, in turn, forces extensive modernization of port equipment and the provision of better connections both with the sea and the hinterland served by the port. Among the new cargo handling and transportation innovations mention should be made of container traffic. It is considered a profitable introduction of modern technology into the field of shipping and cargo handling. With the continuity of crane operation it guarantees saving time and expenditure.

(5) With the discovery of new oil and gas reserves in seas and oceans offshore structures—powerful steel or concrete oil platforms to be installed in the open sea—have been developed. Their purpose is to provide a base from which to perform drilling, oil producing operations at sea. As compared to the earliest structures of this kind in water depths of 6-15 m, the modern offshore platforms have increased in size, weight and strength and extend as deep as 280-300 m.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Следующие английские слова вызывают неправильную аналогию с русскими словами. Например, слово prospect означает «перспектива», а не «проспект». Учитывая это, переведите выделенные слова, пользуясь словарем.

the **position** of the port is favourable; this structure **projects** into the sea and protects the port; **provision** of better connections

2. Соедините слова из двух колонок, образуя термины; переведите их.

carrying	activities
berthing	areas
cargo handling	facilities
harbour	movements
storage	capacity
crane	structures

3. Просмотрите текст и укажите, какое из данных предложений выражает главную мысль текста. (Время — 5 мин.)

1. Port equipment is being increasingly modernized and reconstructed.

2. The design of the port, its landing facilities and cargo handling operation are considered here.

3. One of the fields of port operation is passenger transportation traffic.

4. Укажите, какое из данных предложений (a, b) уточняет следующие утверждения.

1. Nowadays cargo handling and transportation techniques are increasingly developing.

a) The shape of the harbour should suit the aims of port operation. b) It forces extensive modernization of port equipment.

2. Quays and piers are the main port structures for landing.

a) The vessels must be given an opportunity of easy entry and departure. b) Quays are built parallel to the shore while piers project into the sea.

5. В соответствии с содержанием текста дополните незаконченные предложения одним из данных вариантов (a, b, c).

1. As marine structures rank among the most expensive engineering works...

a) they must withstand great stresses; b) the speed of cargo handling must be very high; c) their research and design should provide safety and economy.

2. The carrying capacity of the berth must be high as...

a) there are wind and wave actions; b) heavy cargo handling and storing facilities are placed on it; c) container traffic is a cargo transportation innovation.

3. As a pier projects into the sea...

a) an accurate design of stresses is important; b) the old structures demand extension; c) an opportunity of both-side berthing is provided.

6. Укажите, какое предложение (a, b, c) является ответом на каждый из данных вопросов.

1. What contributes to the rapid development of the port?

a) The port basin should be protected from winds and waves. b) The expansion of trade and increased industrialization together with town development create favourable conditions for port growth. c) The rapid development of the port depends only on meteorological phenomena.

2. How is modern technology introduced into the port operation?

a) Berthing facilities become more various in type, their dimensions increase. b) Piers and jetties nowadays allow both-side berthing. c) Continuity of crane operation and container

traffic as modern technological developments promote successful port operation.

3. Why should the port design be flexible?

a) The port design should be capable of being modified under various conditions. b) The port design should provide safety and economy. c) The geographical position should give the port design all the advantages.

7. Из предложенных пунктов плана выберите те, которые отражают содержание текста, и расположите их согласно последовательности изложения.

1. Berthing facilities—wharves and piers: their types, dimensions and advantages.
2. Types of foundations for marine structures.
3. The main requirements the port layout should meet.
4. Structures for oil production at sea.
5. Conditions necessary for a port springing up and its further successful development.
6. The necessity of greater speed in ship turn-round requires the port to be provided with the latest innovations in the field of shipping and cargo handling.
7. Measures to protect the river banks against washing out.

8. К следующим русским сочетаниям слов подберите английские эквиваленты из правого столбца.

в свою очередь	1. claim attention
в отличие от набережной	2. in laying out the port
требовать внимания	3. unlike a quay
при планировке порта	4. the longer the pier the wider
взаимовыгодное влияние	5. mention should be made of
следует упомянуть о	6. mutually beneficial influence
чем длиннее пирс, тем шире	7. in its turn

9. Переведите 2-й и 4-й абзацы текста.

10. Укажите, какие предложения противоречат содержанию текста; опровергните их.

1. Old port structures require extension or reconstruction, as the cargo handling equipment develops and the demands are increased. 2. Quays serve to berth vessels on both sides. 3. Container traffic is assuming a more important role. 4. Port operation prevents the industrial growth of the town. 5. A pier doubles the berthing space of a wharf. 6. Passenger traffic is handled together with the cargoes.

11. Переведите устно со словарем. (Время — 15 мин.)

The development of oil fields in seas is extending. The programmes of oil exploration in the North Sea by the sea-bordering countries are extensive to ensure a secure supply of home-produced fuel. Most of the structures there are of concrete, especially in the northern region. The reason is not so much cost, nor the failure of steel but the fact that at the depth of about 300 m oil cannot be moved ashore for storage by pipelining without a risk. So all the oil produced is loaded either directly onto tankers at the field or is kept in concrete storage sells on the platform.

The latest offshore structure installed by Norway is 271 m high above the seabed and is supported by four concrete columns with the deckload of 35,000 tons, the storage cells capacity exceeding that existing elsewhere. A new design is being elaborated with platform legs arranged in a I-configuration for the purpose of separating the accommodation from processing area with a firewall.

12. Дополните следующие предложения не менее чем двумя-тремя предложениями, развивая выраженную мысль.

1. Berthing structures are various and their types depend on their positions and capacities. Thus...

2. The site for a future port is selected according to the main requirements it must meet which are...

13. Переведите предложения, обращая внимание на выделенные слова.

1. A pier provides an opportunity of both-side berthing thus **doubling** the berthing space of the wharf. **Doubling** the berthing space of the wharf is achieved by building piers. 2. Port designers created many schemes, **gaining** experience for achieving greater economy. **Gaining** experience in port designing plays a great role in achieving greater economy. 3. **Accelerating** the speed of the ship turn-round forces modernization of the port equipment and better connections with the land area. **Accelerating** the speed of the ship turn-round, modern technology contributes to successful and economical port operation.

14. Обратите внимание на смысловую разницу следующих пар слов и переведите данные ниже предложения.

ready *adj*	готовый
readily *adv*	свободно, легко
a room *n*	комната
room *n*	пространство, место

continue *v*	продолжать
continuous *adj*	сплошной, непрерывный
consider *v*	рассматривать, считать
considerable *adj*	значительный
various *adj*	различный
variable *adj*	переменный, колеблющийся
project *n*	проект
project *v*	выступать вперед, выдаваться
refer to *v*	ссылаться на
to be referred to ... as ...	называться
support *v*	поддерживать, быть основанием, опорой
support *n*	опора, поддержка

1. There was much **room** provided for some additional machinery to be installed later on. They were received in a **room** which resembled a museum hall. 2. The cargoes **ready** for handling were stored at the nearest end of the pier. The harbour basin should be wide enough to enable vessels **to readily** enter and leave it. 3. The design they **considered** had definite advantages in many respects over the rest. The force of waves may be **considerable** and may cause destruction. 4. The discharge operation should not **continue** too long so as not to keep other ships waiting for berthing. A quay is a **continuous** structure along the river bank or the sea shore used for berthing. 5. **Various** marine structures are designed for such loading. The wind velocity and its direction are **variable** and it should be taken into consideration in the design. 6. The chapter the author **refers to** deals with the details of the construction. The structure **referred to as** a wharf, serves for berthing operations. 7. The marine structures may **support** a roadway, railway tracks and some handling machinery. You may **support** my proposal or not, but this is my opinion. 8. A structure **projecting** into the water is called a pier or a jetty. The design data of the **project** were thoroughly examined and checked by different means.

15. Образуйте прилагательные от следующих слов, используя суффиксы '-able', '-ible', а затем — существительные с суффиксом '-ility'; переведите их.

suit, access, desire, advise, capable, able, available, flexible, possible, responsible, durable

16. Ответьте на следующие вопросы.

1. Why does a port design require especially thorough research and an accurate design? 2. Why is there a need to accel-

erate the speed of the ship turn-round? 3. Why should continuity of crane operation be guaranteed? 4. How do quays differ from piers?

17. а) Прослушайте текст, прочитанный преподавателем, ответьте на следующий вопрос.

What kind of a new marine structure has been developed?

б) Прослушав текст еще раз, завершите данный ниже абзац, указав три причины, усложняющие работу сооружения.

The presence of ice fields makes the behaviour of the structure in the open sea very complicated. This involves the consideration and analysis of new load problems due to...

VII — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните значения следующих слов и словосочетаний, знакомых вам из предыдущих текстов.

accommodation, harbour, to rank among, to claim attention, shore, mostly, to withstand, thoroughly, to facilitate, excavation, to pump out, float, removal, to demand for, volume, urgent, pollution, leakage

2. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

phenomenon, prevailing, combination, dock, constant, to function, selection, gigantic, tonnage, corrosion, cathodic, permanent, gravity

К каким из вышеприведенных слов русскими эквивалентами являются слова: «явление, сочетание, выбор, долговечный (постоянный)»?

3. Прочтите и запомните значения следующих слов для лучшего понимания текста.

breakwater волнолом
port basin акватория порта
prevailing преобладающий, господствующий
designation назначение
to arrange устраивать
to facilitate облегчать
gates ворота
to submerge погружать в воду

4. Прочтите текст. Определите, в чем состоит различие принципа работы сухого и плавучего доков.

Text. On Marine Structures

(1) To create a quiet port basin and provide safe accommodation for the ships the harbour should be protected from the wind and wave actions by special engineering works if sheltering has not been provided by nature.

(2) As marine structures rank among the most expensive the demands for safety and economy of the engineering works are especially high. Meteorological phenomena—winds, frequency of storms, the height and force of waves, etc. claim special attention of the designer of protective structures, such as breakwaters. As the name implies, they serve to break the waves and reduce their force and effect on the port basin. They are built away from the shore on the side of the port mostly affected by prevailing winds and waves. Being gravity structures breakwaters depend for their stability upon their weight. Natural rock and concrete or a combination of both are the materials which form 95 per cent or more of all breakwaters constructed.

(3) Any important port cannot do without docks of which there are three main types depending on the designation. They are: harbour docks, repair or dry docks and shipbuilding docks. The harbour docks are particularly useful in harbours with a considerable water level change due to tides. It is so arranged that the water inside may be kept at a more or less constant level to facilitate loading and unloading of cargoes. Repair docks are basins usually made by excavation, having entrance-ways closed with gates. After the ship is floated in, the gates are closed, the water is pumped out and the ship settles on the blocks specially provided for the purpose. Another type of this structure is a floating dock serving the same purpose but functioning on a different principle. It is submerged by letting water into its interior and the ship is floated into position. The removal of the water from the dock by pumping raises the structure with the ship within. Both the docks have their advantages and the selection of the type of structure fully depends on local conditions and requirements.

(4) When discussing port structures mention should be made of coal and oil jetties—special berths situated apart, for reasons of convenience and fire prevention. They either have storage tanks or are equipped with pipelines leading to storage tanks on the shore. To move large volumes of oil around the world gigantic tankers have been developed. This gave rise to the problem of enlarging oil ports to accommodate tankers

of, say, 312,000-ton deadweight. No less urgent is the problem of effective oil pollution control.

(5) Two obvious steps to be taken to solve the problem of oil pollution are: prevention of oil leakage from tankers and oil storage tanks and second—the containing or removal of oil when spillage occurs. At present there is no single technique whereby oil spillage can be completely controlled, but some methods have been developed of retaining oil polluted water in a confined area.

(6) As to the materials used for marine structures the leading role is played by concrete of prestressed and precast kinds and steel. Improved protective coatings against corrosion, such as cathodic, help to make steel below water level reasonably permanent.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какие из данных предложений являются неправильными с точки зрения содержания текста и какие не соответствуют содержанию текста.

1. With the growth of the deadweight of oil tankers the necessity of more effective pollution control has become very urgent. 2. Navigation in a harnessed river is made possible by providing locks. 3. Breakwaters are built to reduce the force of waves and their effect on the port basin. 4. Dry docks may be used for providing protection for vessels during unloading operations. 5. In harbours with a considerable water level change harbour docks are particularly useful. 6. Coal and oil in modern ports are handled together with other cargoes. 7. Passenger transportation traffic has greatly increased of late and forms a special part of port operation. 8. Ships must be protected against impact at berthing.

2. Расположите следующие пункты плана статьи в последовательности, соответствующей содержанию текста.

1. Modern means of improving the durability of reinforced concrete in marine structures.
2. Provision of ship repairing facilities.
3. Problems raised due to increased volumes of oil to be moved around the world.
4. Means of providing safe accommodation of a ship in the port.

3. Сгруппируйте данные ниже предложения по темам A, B, C.

A. Marine structures demand an accurate design of stresses.

B. Docks may be of different types depending on their designation.

C. Sheltering is very important for port location.

1. The foundation character is very important as it takes the reaction of all the stresses. 2. Sometimes nature provides sites quite sheltered from storms and winds. 3. A harbour dock implies the creation of a basin of constant level to make cargo handling operations easier in tides. 4. Breakwaters are mostly affected by prevailing storms and winds. 5. Berths, in addition, are to withstand the stresses and loads due to the berthing ships and the weight of the equipment. 6. As a rule marine engineers should provide artificial sheltering for the port area. 7. A basin made in some part of the port area and provided with gates forms a dry dock used for repairing. 8. Breakwaters are used as the chief protective structure, creating sheltering in any desirable direction. 9. The floating dock is a box-type structure provided with gates, which is submerged by letting water inside to allow the ship to float in.

4. Прочтите текст за 6 мин. и скажите (по-русски), при каком условии защищенная гавань может быть превращена в крупный порт.

A port is a harbour sheltered from winds and storms either naturally or artificially where marine terminal facilities are provided. These consist of piers or wharves at which ships berth while loading and unloading cargoes, of storage areas where goods may be stored for longer periods while awaiting distribution or selling. Thus the terminal must be served by railroad, highway or inland waterway connections.

The availability of inland communications has an important bearing on the location of a port. Unless it is served with good highways, railroads and waterways leading to inland cities or the conditions are favourable for the development and enlargement of these arteries of communication a port will not flourish. There are many excellent natural harbour locations which, from engineering standpoint, would be ideal for the construction of a port, but which are poorly situated with respect to inland communications. As to the size of a port it is determined to a large extent by the number and the sizes of the ships to use the harbour.

РАЗДЕЛ VIII

THE COMMUNITY AND ARCHITECTURE

VIII — 1A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

principle, material, social, economic, form, element, aesthetic, system, theory, factor, paradox, effect, to illustrate, style, automatically, process, plan, harmonious, phases

2. Прочтите текст. Определите, в каких абзацах раскрывается смысл его заголовка.

Text. Forms and Functions of Architecture

(1) Architecture is the art and the science of building. Without consideration of structural principles, materials, and social and economic requirements a building cannot take form, but unless aesthetic quality also is inherent in its form the building cannot be considered as a work of architecture.

(2) From the very beginnings of architecture many skills, systems, and theories have been evolved for the construction of the buildings that have housed nations and generations of men in all their essential activities, and writing on architecture is almost as old as writing itself. Books on the theory of architecture, on the art of building, and on the aesthetic appearance of buildings exist in fair number. The oldest book we have that sets forth the principles upon which buildings should be designed and aims to guide the architect is the work of Marcus Vitruvius Pollio,* written in the first century B. C.

(3) Architecture is an art, its contemporary expression must be creative and consequently new. The heritage of the past cannot be ignored, but it must be expressed in contemporary terminology. The paradox of the coexistence of change and survival is evident in all phases of the human story. This paradox of change and repetition is clearly illustrated in any architectural style.

(4) Nearly two thousand years ago the Roman architect Vitruvius listed three basic factors in architecture—convenience, strength and beauty. These three factors are always present

*['mɑ:kəs vɪt'ruvɪəs pɔ'lɪoʊ]

and are always interrelated in the best structures. It is impossible for the true architect to think of one of them without almost automatically considering the other two as well. Thus architectural design entails not only the study of solutions for convenience, for structure, and for appearance as three separate processes but also a consideration of the constant interaction of these factors. The architect does not first plan a building from the point of view of convenience, then design around his plan a strong construction to shelter it, and finally adjust and decorate the whole to make it pretty. Any design that evolves from such a procedure will produce only a confused, incoherent, and unsatisfactory building. Of any truly great building we can say that every element in it has a triple implication.

(5) This triple nature of architectural design is one of the reasons why architecture is a difficult art; for it takes a special type of imagination as well as long years of training and experience to produce a designer capable of making the requisite in the light of these three factors—use, construction, and aesthetic effect—simultaneously. The designer must have a sufficient knowledge of engineering and of building materials to enable him to create economically a strong as well as practical structure and, in addition, must possess the creative imagination which will enable him to integrate the plan and the construction into one harmonious whole. The architect's feeling of satisfaction in achieving such an integration is one of his greatest rewards.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какое из данных утверждений выражает главную тему текста. (Время — 5 мин.)

1. The historical background of twentieth-century architecture finds little place in this article. 2. Books on the theory of architecture exist in fair number. 3. Three basic factors in architecture—convenience, strength and beauty—are always present and interrelated in the best structures. 4. This paradox of change and repetition is clearly illustrated in any architectural style.

2. Укажите, какие из данных предложений выражают основное содержание текста. Расположите их согласно последовательности изложения.

1. Architecture is an art, its contemporary expression must be creative and consequently new. 2. There are some people who claim that architecture is not a fine art at all. 3. Writing

on architecture is almost as old as writing itself. 4. The triple nature of architectural design is one of the reasons why architecture is a difficult art. 5. Of any truly great building we can say that every element in it has a triple implication. 6. A building cannot be considered as a work of architecture, unless aesthetic quality is also inherent in its form. 7. The architect's feeling of satisfaction in achieving such an integration is one of his greatest rewards.

3. Укажите, какие из данных предложений раскрывают смысл утверждения: 'Architecture is the art and the science of building'.

1. The heritage of the past cannot be ignored, but it must be expressed in contemporary terminology. 2. Without consideration of structural principles, materials and social and economic requirements a building cannot take form. 3. The architect's feeling of satisfaction in achieving such an integration is one of his greatest rewards. 4. From the very beginnings of architecture many skills, systems and theories have been evolved. 5. Architectural design entails not only the study of solutions for convenience, for structure, and for appearance as three separate processes but also a consideration of the constant interaction of these factors. 6. It takes a special type of imagination as well as long years of training and experience to produce a designer capable of making the requisite in the light of these three factors.

4. В соответствии с содержанием текста дополните предложения одним из данных вариантов (a, b, c).

1. From the very beginnings of architecture many systems and theories have been evolved for the construction of the buildings...

a) that set forth the principles upon which buildings should be designed; b) that have housed nations and generations of men in all their essential activities; c) that every element in it has a triple implication.

2. The designer must have a sufficient knowledge of engineering and of building materials...

a) to produce a talented designer; b) and must possess the creative imagination which will enable him to integrate the plan and the construction into one harmonious whole; c) to enable him to create economically a strong as well as practical structure.

3. ...but it must be expressed in contemporary terminology.

a) This paradox of change and repetition is clearly illustrated... b) Nearly two thousand years ago the Roman archi-

tect Vitruvius listed three basic factors in architecture... c) The heritage of the past cannot be ignored...

4. ...and books on the theory of architecture exist in fair number.

a) The paradox of the coexistence of change and survival is evident in all phases of the human story... b) Thus architectural design entails the study of solutions for convenience, for structure, and for appearance... c) Writing on architecture is almost as old as writing itself...

5. "Memory test". Восстановите по памяти (на русском языке), в каком контексте упоминаются следующие сочетания.

1. listed three basic factors in architecture
2. a building cannot take form
3. architecture is a difficult art

6. По формальным признакам найдите группы подлежащего и сказуемого и определите границы главного и придаточных предложений; переведите предложение.

The oldest book we have that sets forth the principles upon which buildings should be designed and aims to guide the architect is the work of Marcus Vitruvius Pollio, written in the first century B.C.

7. Вставьте данные внизу слова, используя их в качестве подлежащего и сказуемого.

1. Thus architectural ... the study of solutions for convenience, for structure, and for appearance. 2. The ... does not first ... the building from the point of view of convenience, then ... a strong construction to shelter it, and finally ... the whole to make it pretty. 3. Any ... that ... from such a procedure will ... only a confused and unsatisfactory building.

entails, design, decorate, design, architect, plan, produce, design, evolves

8. Сверяясь с текстом, подберите нужное значение для выделенных слов в данных сочетаниях и переведите их.

1. in **fair** number (2) — красивый, значительный, посредственный;
2. from the **very** beginnings (2) — очень *(нареч.)*; самый *(прил.)*;
3. contemporary **terminology** (3) — терминология, средства выражения;
4. creative **imagination** (5) — воображение, фантазия;
5. **practical structure** (5) — практический, практичный, целесообразный; сооружение, структура;

6. into one harmonious **whole** (5) — целое *(сущ.)*; невредимый, целый *(прил.)*

9. Переведите предложения, обращая внимание на выделенные слова.

1. Unit **costs** for rock excavation or for other special types of foundation **form** part of the contract. 2. Without consideration of structural principles, materials, and social and economic requirements a building cannot take **form.** 3. From the very beginnings of architecture many systems and theories have been evolved for the construction of the buildings that have **housed** nations and generations of men. 4. The tunnels **house** two 30" belt conveyers. 5. Large motion-picture **houses,** however, frequently have spacious foyers. 6. The primary **aim** of the architect is to design for maximum flexibility. 7. The oldest book that sets forth the principles upon which buildings should be designed and **aims** to guide the architect is the work of Marcus Vitruvius Pollio. 8. The architect does not first **plan** a building from the point of view of convenience, and then design around his **plan** a strong construction to **shelter** it. 9. In the so-called framed house these walls are so designed that they furnish support as well as **shelter.**

10. Переведите предложения, обращая внимание на употребление определенного и неопределенного артиклей.

1. Architecture is **the** art and **the** science of building. 2. As architecture is **an** art, its contemporary expression must be creative and consequently new. 3. This triple nature of architectural design is one of **the** reasons why architecture is **a** difficult art. 4. It takes **a** special type of imagination as well as long years of training and experience to produce **a** designer capable of making the requisite in **the** light of these three factors. 5. **The** designer must have **a** sufficient knowledge of engineering and of building materials, and in addition, must possess **the** creative imagination which will enable him to integrate **the** plan and **the** construction into one harmonious whole. 6. Nearly two thousand years ago **the** Roman architect M. Vitruvius Pollio listed three basic factors in architecture. 7. It is impossible for **the** true architect to think of one of them without considering **the** other two as well. 8. Thus architectural design entails not only **the** study of solutions for convenience, for structure, and for appearance but also **a** consideration of the constant interaction of these factors.

11. Переведите 4-й и 5-й абзацы текста.

12. Подберите соответствующий перевод из правого столбца к данным английским словам.

structural (1)	1. конфуз
nation (2)	2. практический
activities (2)	3. нация
ignore (3)	4. конструктивный
basic (4)	5. активность
procedure (4)	6. игнорировать
confused (4)	7. деятельность
special (5)	8. базовый
practical (5)	9. основной
	10. беспорядочный
	11. последовательность, метод
	12. целесообразный
	13. особый

13. К каждой данной паре дайте русское слово с тем же корнем, что и английское слово, помогающее понять его смысл.

О б р а з е ц: to express — выражать (экспрессия)

1. separate — отдельный (...); 2. constant — постоянный (...); 3. to decorate — оформлять (...); 4. nature — характер (...); 5. training — подготовка (...); 6. reason — причина (...); 7. to integrate — объединять в единое целое (...); 8. repetition — повторение (...); 9. function — назначение (...); 10. the requisite — все необходимое (...); 11. to evolve — развивать (...); 12. essential — основной (...)

14. а) Укажите, какие из данных слов имеют отрицательные префиксы 'un-', 'in-', 'im-', переведите их.

impossible, imply, incoherent, imagination, integration, unsatisfactory, imitation, unless, inherent

б) Укажите, какие из данных слов являются существительными и какие — прилагательными.

principal, cultural, denial, material, structural, essential, social, practical, historical, architectural, survival, economical, principle

в) Образуйте от следующих глаголов существительные, используя соответственно суффиксы '-tion', '-ion'.

to repeat, to construct, to consider, to express, to create, to imagine, to integrate, to illustrate, to interact, to interrelate, to produce, to imitate, to decorate, to add, to recognize, to imply, to satisfy

15. Опровергните данные утверждения не менее чем двумя высказываниями каждое (см. упр. 14, с. 12).

1. Architecture is the art but not the science of building. 2. It is quite possible for the true architect to think of the basic factors in architecture—convenience, strength and beauty—as three separate processes.

16. Прослушав текст, прочитанный преподавателем, ответьте по-английски на следующий вопрос.

What innovations are attributed to Mr Wright, an outstanding American architect?

17. Переведите письменно со словарем. (Время — 30 мин.)

The architect uses drawings to achieve his objective, but in the strict meaning of the term a work of architecture exists only when it stands complete, a concrete object for all to see or to use. Drawings, no matter how magnificent the design they show, are never in themselves works of architecture. The dangers of "paper architecture" are very great. It is necessary to point out that many elements which look well on a drawing may be either completely ineffective or definitely harmful in the actual building. Paper architecture is the result of thinking of drawings and the effects they make as an end rather than a means. In fact, drawings can represent buildings only symbolically. A valid criticism against much eclectic architecture is that it is essentially paper architecture, because eclectic buildings are full of decorative elements which look well on the drawing—perhaps even seem necessary on the drawing—yet in the actual buildings they are completely meaningless.

VIII — 1B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

effect, element, physical, materials, escalator, hall, corridor, interior, activity, alphabet, musician, practically, aesthetically, real, detail, isolated, factor, emotional, problem, fantasy, sculpture, poems, music, clinics

2. Вспомните значения следующих английских слов и подберите соответствующий перевод из правого столбца.

to design	1. понимать
coexistence	2. создавать
to shelter	3. искусство
value	4. выражение

true	5. истинный
separate	6. укрывать
to integrate	7. сооружение
to create	8. проектировать
beauty	9. сосуществование
essential	10. ценность
consideration	11. так же, как; а также
appearance	12. раздельный
to realize	13. прочность
expression	14. внешний вид
convenience	15. рассмотрение, учет
to construct	16. строить
as well as	17. единое (целое)
art	18. красота
structure	19. существенный, важный
strength	20. удобство
the whole	21. объединять в единое целое
activities	22. деятельность

Text. Forms and Functions of Architecture

(Continued)

(1) The value of true architecture lies in the direct effect of the structure itself and of the actual elements of which it is constructed. Outside we observe the physical structure; we see variations of plane, of colour, and of light and shade. Each one of these variations is due to the effects of light on the building materials employed. There are doors to allow ingress and egress; windows to admit light and air; walls for shelter or support, or both; roofs to keep out the rain, snow, cold, and sometimes sun.

(2) We enter the building, and the same complexity of elements meets our attention. Partitions separate space from space; there may be stairs, escalators, or elevators to allow progress from level to level and halls or corridors to permit easy circulation from part to part; finally there may be all sorts of interior spaces for definite human activities.

(3) Such elements—walls and openings, supports, floors and ceilings, enclosed areas or rooms—are the letters of the architect's alphabet, it is with these that he must project an integration of the whole in order to create a work of architecture. A knowledge of this alphabet is as essential to him as a knowledge of words to the writer or of notes to the musician. No building can exist without some of them, and upon their

correct arrangement and design the success of the building, both practically and aesthetically, will almost entirely be founded.

(4) Yet a separate consideration of individual elements is in a very real sense artificial. The architect must always study each detail from the viewpoints of both use and appearance as well as from that of construction, and he must continuously see it not as an isolated detail but as an individual note in a great composition.

(5) The sequence of the three basic aims—convenience, strength and beauty—has its own significance. First any building exists for some particular purpose, it is built because of some definite human need, either practical or emotional, or both. The use problem—convenience—is therefore primary.

(6) Next, the construction of any object or shelter for human use must be a true construction; that is, it must stand up solidly for the duration for which it is designed. Hence "strength" becomes the second necessity, as important as the first yet in a way subsidiary to it.

(7) Finally, mankind has always realized that buildings to be complete must have not only "convenience" and "strength" but also "beauty". There are some who claim that architecture is not a fine art at all and that its single purpose should be the satisfying of physical necessities. For such people, the world of fine arts is something entirely set apart from ordinary living, it is a matter of pictures or sculpture, of poems or music.

(8) The architect has the task of being an artist as well as an inventive engineer. The expression of the purpose of buildings would seem to call for additional thought on this point. The emotions evoked by theatres, churches, clinics, and dwellings will always differ from one another.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какие абзацы текста можно сгруппировать по следующим темам. Расположите данные предложения в последовательности, соответствующей содержанию текста.

1. Such elements are the letters of the architect's alphabet. 2. For a building to exist there must be adequate structure. 3. The expression of the purpose of buildings calls for additional thought. 4. The value of true architecture lies in the direct effect of the structure.

2. Укажите, какие из данных предложений отражают основное содержание текста и какие касаются деталей.

1. The architect has the task of being an artist as well as an inventive engineer. 2. The building is built because of some definite human need. 3. There are some who claim that architecture is not a fine art at all. 4. Each one of these variations is due to the effects of light on the building materials employed. 5. The sequence of the three basic aims—convenience, strength and beauty—has its own significance. 6. The construction of any object or shelter for human use must be a true construction. 7. The architect must continuously see each element not as an isolated detail but as an individual note in a great composition. 8. Buildings, to be complete, must have not only "convenience" and "strength" but also "beauty". 9. When we observe the physical structure we are struck by the complexity of elements. 10. There may be all sorts of interior spaces for definite human activities.

3. В соответствии с содержанием текста дополните предложения одним из данных вариантов (a, b, c).

1. There are doors...

a) to admit light and air; b) to allow ingress and egress; c) to keep out the rain, snow, cold, and sometimes sun.

2. Finally there may be all sorts of interior spaces...

a) for shelter or support; b) to create a work of architecture; c) for definite human activities—rooms both public and private.

3. ...of which it is constructed.

a) Hence "strength" becomes the second necessity... b) The architect must always study each detail from the viewpoints of both use and appearance... c) The value of true architecture lies in the direct effect of the structure itself and of elements...

4. ...that is, it must stand up solidly for the duration for which it is designed.

a) The construction of any object or shelter for human use must be a true construction... b) Any building exists for some particular purpose... c) It is built because of some definite human need, either practical or emotional, or both...

4. Сверяясь с текстом, укажите то из приведенных словарных значений, в котором данное слово употреблено.

1. variation (1) — изменение, вариация, разновидность;

2. progress (2) — развитие, движение вперед, прогресс, достижение;

3. circulation (2) — круговое движение, циркуляция, обращение, распространение;

4. individual (4) — личный, характерный, отдельный, индивидуальный;

5. composition (4) — произведение, структура, композиция, построение, состав *(хим.)*;

6. object (6) — предмет, объект, вещь, цель;

7. to realize (7) — представлять себе, понимать, реализовать, осуществлять, получать прибыль;

8. ordinary (7) — обычный, обыкновенный, ординарный, заурядный.

VIII — 2A

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют те же корни, что и следующие английские слова.

symbol, foundation, ideal, mechanical, various, zone, horizontal, naive, function, sociology, transportation, symbolization, potential, air-conditioned, base, biography, finance, idea, culture, to characterize, biological, to examine, expression, massive, element, aesthetic, protection, production, to dominate, human, physical, planning, form, fundamental, political, technical, nature

2. Вспомните значения следующих английских слов.

obvious, to create, improvement, in terms of, skyscraper, artificial, space, needs, purpose, activities, to outline, to integrate, dwelling, recreation, to exist, relationship, generation, visible, medieval, no matter, cost, concern, pattern, population, education

3. Прочтите текст. Укажите, какой абзац полностью посвящен идее заголовка текста.

Text. The Modern City as a Symbol of Modern Man

(1) The modern city has still to be built, and the first step toward sinking its foundations into the earth is to raise its ideal structure in the mind. It is obvious that the "modern city" cannot be created by mechanical improvements, especially if it is conceived in the childish terms used in the 1920s by various American skyscraper architects in portraying super-skyscraper cities lived in largely under artificial light, zoned in horizontal layers according to incomes and utilizing

every mechanical device. Even Le Corbusier's refinement of this picture—with wide green spaces, trees, sunlight, and sport-fields—though plainly more human, is still naive, for it neglects the essentials of family life and neighbourly intercourse.

(2) The architectural embodiment of the modern city is in fact impossible until biological, social, and personal needs have been canvassed, until the cultural and educational purposes of the city have been outlined, and until all of man's activities have been integrated into a balanced whole. One cannot base an architectural conception on such a sociology as that which led a group of modern architects and planners to examine the modern city with reference to only four functions: work, transportation, dwelling, and recreation. The city, if it is anything, is an expression and symbolization of man.

(3) Conceivably a city could be built underground, or it might be enclosed within a single massive air-conditioned skyscraper with no window opening to the outer world. Proposals were current for both types. But one important element would be lacking in such a city—the aesthetic symbolization of its contents, its activity, its meaning. Above all, the city is a symbol of social relationships. In cities not only do the social functions exist, they signify. Architecture and city planning are the visible translations of the total meaning of a culture. Each generation writes its biography in the buildings it creates; each culture characterizes in the city the unifying idea that runs through its activities. The medieval city says: "protection under the eye of God"; the Baroque city says: "power under the favour of the Prince"; the industrial city says: "production no matter what the human cost"; the American metropolis says: "finance must dominate". In the ideal form of the modern city one must look for a fuller embodiment of needs than any recent culture has produced.

(4) The physical problems of planning and the question of architectural form are closely connected with the more fundamental concerns of the relation of population to industry and to the land, the possibilities of creating a new rural-urban pattern, and a reinterpretation of human needs in terms of twentieth-century political and technical possibilities. No ideal plan can do justice to the potential nature of modern man if it does not further the interaction of the urban and the rural patterns of life bringing gardens, parks and recreation spaces into the heart of the city and making available for the most isolated country dweller the fullest resources of culture and education.

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, к каким абзацам текста могут служить заголовками данные предложения. Расположите их согласно последовательности изложения. (Время — 5 мин.)

1. The city as a symbol of social relationships.
2. The plan neglects the essentials of family life.
3. Different forms and ideas of the "city of the future".
4. The modern city has still to be built.
5. One cannot base an architectural conception on such a sociology.
6. The city as an expression and symbolization of man.

2. Сгруппируйте данные ниже предложения по темам A, B, C.

A. Different forms and ideas in which the "city of the future" was conceived.

B. The principles on which the architectural embodiment of the modern city should be based.

C. Each generation writes its biography in the buildings it creates.

1. The modern city shouldn't be examined with reference to only four functions: work, transportation, dwelling, and recreation. 2. Conceivably a city could be built underground. 3. It is obvious that the "modern city" cannot be created by mechanical improvements. 4. Each culture characterizes in the city the unifying idea that runs through its activities. 5. Above all, the city is a symbol of social relationships. 6. The modern city should be examined with reference to biological, social, and personal needs of the community, its cultural and educational purposes. 7. A city might be enclosed within a single massive, air-conditioned skyscraper with no window opening to the outer world. 8. In cities not only do the social functions exist, they are significant. 9. The physical problems of planning and the question of architectural form are closely connected with the more fundamental concerns of the relation of population to industry and to land and the possibilities of creating a new rural-urban pattern. 10. The architects envisioned super-skyscraper cities lived in largely under artificial light, zoned in horizontal layers according to incomes, and utilizing every mechanical device. 11. The medieval city says: "protection under the eye of God". 12. In the ideal form of the modern city one must look for a fuller embodiment of human needs. 13. A city should be big enough to achieve social co-operation, but not so big as to handicap these functions. 14. The Baroque city says: "power under the favour

of the Prince". 15. No ideal plan can do justice to the potential nature of modern man if it does not further the interaction of the urban and the rural patterns of life. 16. The industrial city says: "production no matter what the human cost".

3. Используя упр. 2 и текст, прокомментируйте на русском языке тему В из упр. 2.

4. Сверяясь с текстом, подберите из правого столбца нужное значение для данных слов и выражений.

with reference to (2)	1. предположительно
if it is anything (2)	2. если хотите
conceivably (3)	3. с точки зрения
no matter what (3)	4. ссылаясь
in terms of (4)	5. какой бы ни было
do justice (4)	6. отдать должное
above all (3)	7. относительно
	8. в переводе на
	9. пожалуй
	10. прежде всего

5. Вставьте в пропуски следующие выражения.

no matter, except by, in terms of, with reference to, as well, as well as, in contrast with, if it is anything

1. The question of architectural form is closely connected with a reinterpretation of human needs ... twentieth-century political and technical possibilities. 2. The industrial city says: "production ... what the human cost". 3. One cannot base an architectural conception on such a sociology as that which led a group of modern architects and planners to examine the modern city ... only four functions: work, transportation, dwelling, and recreation. 4. Sometimes the twentieth-century architects know no other way of achieving height ... erecting skyscrapers. 5. The imprint showed itself in a preference for straight streets over curved ones, ... what the expense. 6. the medieval town, the Baroque city demands flat sites, straight streets, and uniform building lines. 7. It takes a special type of imagination ... long years of training and experience to produce such a designer. 8. The city, ..., is an expression and symbolization of man's wholeness. 9. It is impossible for the true architect to think of one of them without considering the other two 10. The designer must create economically a strong practical structure.

6. Учитывая формальные признаки данных в скобках слов, вставьте их в предложения.

1. Each its biography in the buildings ... ... (writes, creates, it, generation). 2. The architectural ... of the modern city is in fact ... until all of man's ... have been (needs, impossible, outlined, embodiment). 3. No ideal ... can ... justice to modern man if ... does not ... the interaction of the urban and rural patterns of life (further, plan, it, do).

7. Сверяясь с текстом, подберите нужное значение для выделенных слов в данных сочетаниях и переведите их.

1. visible **translations** of the **total** meaning (3) — перевод, интерпретация, воплощение в жизнь, осуществление; весь, полный, целый;

2. that **runs through** (3) — прокалывать, просматривать, пронизывать, зачеркнуть;

3. under the **favour** of the **Prince** (3) — одобрение, доброжелательность, благосклонность, покровительство; князь, король, государь, правитель;

4. **resources** of culture and education (4) — запасы, ресурсы, возможность, средство

8. Вставьте в пропуск необходимую форму глагола страдательного или действительного залога.

1. The modern city cannot (create, be created) by mechanical improvements. 2. One cannot ... (base, be based) an architectural conception on such a sociology. 3. The architectural embodiment of the modern city is impossible until biological, social, and personal needs ... (have canvassed, have been canvassed), until the cultural and educational purposes ... (have outlined, have been outlined). 4. This was the chief contribution that modern sociology and technics ... (have made, have been made) to the concept of the city itself. 5. A city could (build, be built) underground, or it might .. (enclose, be enclosed) within a single massive skyscraper. 6. The social limit ... (has constantly exceeded, has been constantly exceeded) in the expansion of modern cities. 7. Each culture ... (is characterized, characterizes) in the city the unifying idea that (is run, runs) through its activities.

9. В соответствии с содержанием вставьте в пропуск необходимую форму: past participle или present participle.

1. American skyscraper architects envisioned super-skyscraper cities ... (lived in, living in) largely under artificial light, (zoned, zoning) in horizontal layers according to incomes, and ... (utilized, utilizing) every mechanical device. 2. The city of the future was conceived in the childish terms

... (used, using) in the 1920s by various American architects. 3. There is no natural limit to the city's growth except for a primitive dependence on a ... (limited, limiting) water and food supply. 4. The social co-operation is of a complex kind (based, basing) on the necessary division of labour.

10. Составьте на русском языке аннотацию к тексту.

11. Опровергните данные утверждения не менее чем тремя высказываниями каждое (см. упр. 14, с. 12).

1. Architecture and city planning cannot be called visible translations of the total meaning of a culture. 2. The physical problems of planning and the question of architectural form are not connected with any concerns of importance.

12. Дайте не менее трех ответов на следующий вопрос (на английском языке).

What are some of the mechanical improvements suggested in the text as the means of creating the "modern city"?

13. Прослушав текст, прочитанный преподавателем, отразите в цифрах рост населения упоминаемых в нем городов. Заполните таблицу.

in the Middle Ages	from the Middle Ages up to the 19th century	in the 19th century

14. Переведите письменно со словарем. (Время — 35 мин.)

Exciting City in Soviet North

In view of the booming economy and overall growth of the Soviet Union it would seem somewhat odd to pick out and describe the establishment of one of the many new cities. What makes Norilsk of special interest is that it is north of the Arctic Circle and just across the pole from Northern Canada.

Norilsk is being built fast. Its latitude is 69 degrees, its cold sometimes reaching below 50 degrees Centigrade. There is a short, sunny summer, there are 250 days of strong winds, sometimes blizzards, which accentuates the cold. For 47 days it is completely dark night and day. Polar night is compensated for by a polar day when there is light for 24 hours a day. Norilsk is a modern city with smelters and other industrial

and service establishments. This is not to speak of dwelling houses, kindergartens, schools, medical colleges, two scientific research institutes, libraries, a sport palace, hospitals; and all this is on stilts. This is a permafrost country. If you simply built on permafrost as a foundation, the structure would collapse during the first thaw. So a method was found to build into the permafrost foundation. Holes are made into the frozen earth about 10 yards deep. Strong piles are placed in them each surrounded with a mixture that freezes right into the permafrost. Those piles are the stilts upon which the structure is erected—about 200 for each building. They form a firm foundation for they are frozen deep into permafrost. More than one third of the houses are prefabricated, the rest are made of brick.

15. К каждой данной паре подберите русское слово с тем же корнем, что и английское слово.

1. to portray — рисовать, изображать (...); 2. refinement — усовершенствование (...); 3. essentials — основа, сущность (...); 4. personal — личный (...); 5. balanced — соразмерный; уравновешенный (...); 6. conception — замысел (...); 7. metropolis — столица (...); 8. urban — городской (...); 9. isolated — обособленный, удаленный (...)

16. а) Сгруппируйте слова с одним и тем же корнем; определите, какой частью речи является каждое из них, и, сверяясь с текстом, переведите их.

Образец: use *(v, n)* — useful *(adj)* — useless *(adj)* — used *(p.p.)*

envision, dominate, artificial, produce, possible, neighbourly, various, impossible, essential, whole, symbol, possibility, concept, neighbourhood, interrelated, conceivably, wholeness, consider, production, limited, relatively, conception, variation, essentials, symbolization, conceive, relationship, visible, limitation, art, dominance, complex, limit, neighbour, considerable, relation, visual, complexity, invisible

б) Проанализируйте состав следующих слов; переведите их и сопоставьте с составом соответствующих русских слов.

enclosed, super-skyscraper, income, sunlight, embodiment, underground, background, outer, co-operation, through-traffic, self-contained, greenbelt, interaction, outline

17. Прочтите текст про себя за 3 мин. Подберите наиболее подходящий заголовок к нему.

1. Every Cell Has a Norm of Development.
2. No Natural Limits to City's Growth.
3. Limits to City's Growth.

The setting of limits of population, area, and density is the first step in the art of building cities. It is interesting to note that Leonardo da Vinci * recognized the evils of congestion that resulted from the overcrowding of Milan at the beginning of the sixteenth century. He proposed to put its 300,000 people into ten cities of 30,000 each.

Some architects recognize in the city the same limitation on biological growth that is seen in the cell. Every cell has a norm of development. When a cell has reached its optimum of growth, its nucleus divides in two, and two new cells are formed. Cities are not biological organisms, hence, except for a primitive dependence on a limited water and food supply there is no natural limit to their growth—but there is a social limit, and that limit has been constantly exceeded in the expansion of modern cities.

A city should be big enough to achieve social co-operation of a complex kind based on the necessary division of labour, but not so big as to handicap these functions.

VIII — 2B

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Вспомните, какие русские слова имеют тот же корень, что и следующие английские слова.

detailed, experts, statistics, villa, transportation, chance, urbanism, functional, aesthetic, tendencies, medicine, psychology, politics

2. Вспомните значения следующих английских слов.

community, to lay out, single, complex, to realize, to exist, to create, demands, space, effort, in terms, on the basis, to serve, to expand, in the sense, to examine, contemporary, civilization, needs, suburb, development, skyscraper, to concentrate, erection, balance

Text. The Community and Architecture

(1) The forms to be taken by communities must be decided before they are constructed. But long-term "master plans", we have learned, must not be too detailed. Someone must plan

*[ˌlɪə'nɑːdou də'vɪntʃi(ː)]

where streets are to run, parks are to be laid out, and industrial facilities are to be furnished. Someone must plan new housing and new public buildings, parks, and playgrounds. Surely architects are necessary for these. And yet, community planning can never be the work of a single individual or class of individuals. Good community plans need the contribution of experts in many fields. Modern city planning has become so complex, so enmeshed in statistics, and so controlled by financial interests that too often community plans appear that are lifeless and mechanical. In this field it is the architect's task to redress the balance, to realize that cities exist for people (not people for cities), that business and industry and science should serve the people and not enslave them.

(2) During the last century hundreds of cities grew up throughout the world, and thousands of country towns expanded into great industrial or commercial centres. In the sense that all the buildings in Chicago or Los Angeles * were constructed in recent times, they are modern communities. But in these new cities one searches in vain for any common principle of design that would distinguish them from earlier towns.

(3) If, however, one examines the contemporary city more closely, one comes upon forms that had no counterpart in any earlier civilization. The country villa and the suburb are time-honoured forms; but only with the development of rapid transportation, however, did it become possible to disperse the population of a great centre over an area at least ten times as great as the biggest cities of the past. The skyscraper has permitted the assembling of business offices and light industry in concentrated hives, served by vertical transportation; but the erection of such buildings on streets designed for four-story buildings and horsedrawn transportation has everywhere produced chaos.**

(4) Nowhere have the new forces in urbanism been organized so as to create both a functional and an aesthetic unity. One cannot derive an archetype for the modern city from any existing example. Neither can one create it merely by uncritically accepting all technological devices as essential ingredients. There is room, then, for an effort to define the modern community in ideal terms, on the basis of existing facts and tendencies. These facts and tendencies are not confined to the provinces of engineering and architecture; they issue from industry, from education, from medicine and psychology, and indeed from politics.

*[lɔs'ændʒələs]
**['ke (ɪ) ɔs]

ПОСЛЕТЕКСТОВЫЕ УПРАЖНЕНИЯ

1. Укажите, какие из данных вопросов рассматриваются в тексте и в каких абзацах.

1. Why must the long-term "master plan" be not too detailed? 2. Why do good community plans need the contribution of experts in many fields? 3. What specific forms can be found in the contemporary city? 4. Why do lifeless community plans appear rather often? 5. Why are modern communities characterized by formlessness?

2. Найдите в тексте предложения, поясняющие следующие утверждения.

1. There is room for an effort to define the modern community on the basis of existing facts and tendencies. 2. The forms to be taken by communities must be decided before they are constructed. 3. Nowhere have the new forces in urbanism been organized so as to create both a functional and an aesthetic unity. 4. If one examines the contemporary city more closely, one comes upon forms that had no counterpart in any earlier civilization.

3. Дополните незаконченные предложения одним из данных вариантов (a, b, c) в соответствии с содержанием текста.

1. The forms to be taken by communities...

a) need the contribution of experts in many fields; b) can never be the work of a single individual; c) must be decided before they are constructed.

2. Too often community plans appear...

a) that are lifeless and mechanical; b) that are complex and enmeshed in statistics; c) that have no counterpart in any earlier civilization.

3. Good community plans...

a) must not be too detailed; b) are controlled by financial interests; c) can never be the work of a single individual or class of individuals.

4. One cannot create an archetype for the modern city...

a) on the basis of existing facts and tendencies; b) by uncritically accepting all technological devices as essential ingredients; c) from the contributions of experts in many fields.

4. Используя русские слова с тем же корнем для понимания данных английских слов, подберите к ним перевод из правого столбца.

individual (1)	1. соединение, сосредоточение
contribution (1)	2. область, сфера деятельности
commercial (2)	3. человек, личность

disperse (3)	4. вклад
assembling (3)	5. составные части
ingredients (4)	6. экономический, торговый
province (4)	7. распространять

5. Проанализируйте состав следующих слов; переведите их и сопоставьте с составом соответствующих русских слов.

long-term, enmeshed, lifeless, time-honoured, four-story, horse-drawn, uncritically, archetype

Условные сокращения

a — adjective — прилагательное
adv — adverb — наречие
cj — conjunction — союз
indef — indefinite — неопределенный
n — noun — существительное
pron — pronoun — местоимение
prep — preposition — предлог
v — verb — глагол

Aa

absorb *v* поглощать
accelerate *v* ускорять
access *n* подход
accommodate *v* вмещать; размещать; приспосабливать
accomplish *v* выполнять, достигать
accompany *v* сопровождать
according to *prep* в соответствии с
accuracy *n* точность
accurate *a* точный, правильный
achieve *v* достигать, добиваться
achievement *n* достижение, подвиг
acquire *v* приобретать
action *n* действие, воздействие
activity *n* деятельность, активность
acute *a* острый
adapt *v* приспособлять(ся), прилаживать
add *v* прибавлять; присоединять
addition *n* прибавление; **in addition to** кроме того, в дополнение к
adequate *a* отвечающий требованиям, соответствующий, достаточный
adjacent *a* примыкающий
adjust *v* пригонять, прилаживать
admit *v* признавать, допускать
adopt *v* принимать; заимствовать
advance *n* прогресс
advantage *n* преимущество, выгода; удобство
advocate *v* узаконить
aesthetically *adv* эстетически
affect *v* влиять, воздействовать
afford *v* позволить себе (*что-л.*); предоставлять
aggregate *n* заполнитель
age *n* возраст; век, эпоха
agree *v* соответствовать
aim (at) *v* предусматривать, иметь целью
air-conditioning *n* кондиционирование воздуха
allow *v* позволять; делать возможным
alone *adv* только
alter *v* переделывать
alternate *a* чередующийся; **on alternate days** через день
ambient *a* окружающий
amenities *n* удобства
amount *n* количество; величина
analysis *n* исследование
angle *n* угол
annual *a* ежегодный; годовой
apart *adv* отдельно
appear *v* казаться, возникать
appearance *n* появление; внешний вид
application *n* применение
apply *v* применять
area *n* район; площадь
arise *v* возникать
arrange *v* располагать, устраивать
art *n* искусство, умение
artificial *a* искусственный
assembly *n эд.* скопление людей
associate *v* соединять, ассоциировать
assume *v* предполагать
assumption *n* предположение
assure *v* обеспечивать, гарантировать
attain *v* достигать
attempt *n* попытка

attention *n* внимание; **to pay attention to** обращать внимание
auxiliary *a* вспомогательный
available *a* доступный, имеющийся в наличии
availability *n* наличие
average *a* средний; обычный
average *v* равняться в среднем; составлять в среднем
avoid *v* избегать

Bb

backacter (=backhoe) *n* обратная лопата
basement *n* подвал (*здания*)
basic *a* основной, главный
basin *n* бассейн, водоем; акватория порта
beam *n* балка
beauty *n* красота
behaviour *n* поведение (*металла*), режим работы (*машины и т. п.*)
believe *v* полагать
bending load (stress) изгибающая нагрузка (напряжение)
benefit *n* выгода; **to be of benefit** выгодный
beneficial *a* выгодный
berth *n*; *v* причал; причаливать
besides *adv* кроме, в добавление к
bind *v* связывать
blast furnace *n* доменная печь
branch *n* отрасль
break down *v* разрушать(ся)
breakwater *n* волнорез
bridge *n* мост
brick *n* кирпич
brittle *a* хрупкий
body of water *n* водный массив
boom *n* стрела
bucket *n* ковш
bulk *n* масса, объем
built-up *a* составной, сборный; *эд.* застроенный
built-in *a* встроенный
burn *v* гореть

Cc

calculate *v* вычислять; рассчитывать
calculation *n* вычисление; расчет
call for *v* требовать, предусматривать
capable of *a* способный к
capacity *n* мощность; пропускная способность
per capita на человека
careful *a* тщательный
cargo *n* груз
carry out *v* перевозить; выполнять
case *n* случай
cast *v* отливать; заливать (*бетон*)
cathodic *a* катодный
cause *v* причинять, вызывать
cement *n* цемент
century *n* век, столетие
certain *a* определенный; уверенный
chain *n* цепь
challenge *n эд.* угроза
chance *n* случайность; **случай; by chance** случайно
change *n*; *v* изменение; изменять(ся)
charge *n*; *v* загрузка (порция); загружать
cheapest *a* самый дешевый
chemicals *n* химикаты
chief *a* главный, основной
choice *n* выбор
circulation *n* переход; перемещение людского потока
circumstances *n* обстоятельства
claim *v* требовать, заявлять; **to claim to be** считать
clamshell *n* грейфер
clarified *a* осветленный
clear *a* ясный
close *a* тщательный; близкий, непосредственный
closely *adv* тесно
coating *n* покрытие
coexistence *n* сосуществование
coil *n* змеевик
collapse *n* крах; разрушение
collect *v* собирать; улавливать
combination *n* сочетание; **when combined with** в сочетании с
common *a* общий; распространенный; заурядный
commercial *a* торговый; экономический
communal *a* общественный
communication *n* связь; коммуникация
community *n* общество

comparatively *adv* сравнительно
compare *v* сравнивать; **as compared to** по сравнению
comparison *n* сравнение
complementary *a* дополняющий
complete *v* завершать
completely *adv* полностью
complex *a* сложный, комплексный
comply (with) *v* подчиняться; действовать согласно правилам
comprehensive *a* обширный
composition *n* состав; произведение
compression *n* сжатие
compressive *a* сжимающий
computation *n* вычисление
computer *n* ЭВМ
conceal *v* скрывать
conceive *v* задумывать
conceivably *adv* предположительно
concentrate *v* сосредоточивать, концентрировать
concentration *n* сосредоточение
concept *n* понятие; концепция
conception *n* понятие; замысел
concern *n*; *v* забота; касаться; быть связанным с
concrete *n* бетон
concrete *a* конкретный
condition *n* условие; **under conditions** в условиях
condition *v* обусловливать
conductivity *n* проводимость
conduit *n* водовод
confine *v* ограничивать
confuse *v* приводить в беспорядок
confusion *n* путаница, смятение
congestion *n* перенаселенность
connect *v* связывать
consider *v* считать, учитывать
considerable *a* значительный
consideration *n* рассмотрение; соображение; учет; **to take into consideration** принимать во внимание, учитывать
consist of *v* состоять из
consequences *n* последствия
consequently *adv* следовательно
constitute *v* составлять
constituent *a* составляющий
construct *v* строить
construction *n* строительство; конструкция
consume *v* потреблять
consumption *n* потребление
contain *v* содержать
contamination *n* загрязнение; заражение
contemporary *a* современный
content(s) *n* суть, содержание
continuity *n* непрерывность; беспредельность
continuous *a* непрерывный; замкнутый, сплошной
contrary to в отличие от
contribute *v* способствовать
contribution *n* вклад
control *n*; *v* контроль, регулирование; контролировать, регулировать
convenience *n* удобство
convenient *a* удобный
conventional *a* обычный, традиционный
convert *v* преобразовывать; обращать
cool *v* охлаждать
cooling *n* охлаждение
cope (with) *v* справиться, совладать
core *n* ядро
correspondingly *adv* соответственно
corrosion *n* коррозия
cost *n* стоимость, цена
costly *a* дорогостоящий
counterpart *n* прототип
couple *v* соединять; спаривать
crack *n* щель; трещина
crane *n* кран
create *v* создавать
creation *n* создание
creative *a* творческий
crime *n* преступление
crush *v* дробить, раздавливать
current *a* современный; циркулирующий, находящийся в обращении
cut *v* срезать, резать
cycle *n* цикл

Dd

dam *n* плотина
damage *n* повреждение; разрушение
danger *n* опасность
deadweight *n* полная грузоподъемность (*судна*)

deal with *v* иметь дело с
decade *n* десятилетие
decide *v* решать
decomposable *a* подверженный разложению
decorate *v* украшать
decoration *n зд.* отделка
deep *a* глубокий
define *v* определять
definition *n* определение
degree *n* степень; градус; уровень
deliver *v* доставлять
delivery *n* доставка, поставка
demand *n* потребность; требование
demolish *v* разрушать, сносить
density *n* плотность
departure *n* отбытие, отправление
depend on *v* зависеть от; **depending on** в зависимости от
deposits *n* залежи; месторождение
deposit *v зд.* накопить(ся)
depth *n* глубина
derive *v* извлекать
description *n* род; *зд.* сорт
desert *n* пустыня
deserve *v* заслуживать
design *v* проектировать; предназначать
designer *n* проектировщик
designate *v* определять; называть
designation *n* предназначение
desired *a* требуемый, желаемый
despite *prep* несмотря на
destroy *v* разрушать
determination *n* определение
determine *v* определять
develop *v* развивать, разрабатывать
development *n* развитие; застройка; разработка; **water-power development** гидроузел
device *n* прибор; устройство; механизм
differ *v* отличаться; различаться
different *a* различный
dig *v* рыть, копать
dimension *n*; *v* размеры; объем; соблюдать нужные размеры
direct *v* направлять
disadvantage *n* недостаток; ущерб
disaster *n* бедствие
disastrous *a* гибельный
discharge *n* спуск (*зд.* воды потока); сброс; расход
discharge *v* спускать, сливать (*зд.* воду); сбрасывать (паводок)
discover *v* обнаруживать
disposal *n* удаление
distance *n* расстояние
distant *a* отдаленный
distribute *v* распределять
distribution *n* распределение
diverse *a* разнообразный
divert *v* отводить
divide *v* подразделять
dock *n* док, порт
domestic *a зд.* жилой (*дом*), бытовой
double *v* удваивать
dragline *n* канатно-скребковый экскаватор; драглайн
drain(s) *n* канализационная труба
drainage *n* канализация (*сток*)
dream *n* мечта
drill *v* бурить
drilled *a* пробуренный
drilled well скважина, артезианский колодец
drive *v* приводить в движение; *зд.* двигать(ся)
drought *n* засуха
dry *a*; *v* сухой; высушивать
dual *a* совместный, двойной; *зд.* совместного рассмотрения
due to *prep* благодаря
durable *a* прочный, долговечный
durability *n* прочность, долговечность
dwelling *n* жилище, жилой дом

Ee

earth *n* земля; грунт
economy *n* хозяйство; экономика, экономия; **national economy** народное хозяйство
edge *n* острие, лезвие; кромка
education *n* образование
educational *a* учебный
effect *n* действие, воздействие, эффект; **to this effect** для этой цели
effective *a* действенный, эффективный
efficiency *n* эффективность; КПД
efficient *a* эффективный; целесообразный; продуктивный

effort *n* усилие, попытка
either *a* любой (*из двух*); **in either case** в любом случае; **either ... or** или ... или
elaborate *a* разработанный тщательно
elevate *v* поднимать
elevation *n* подъем; отметка (*уровня*)
eliminate *v* устранять
elsewhere *adv* (где-нибудь) в другом месте
embed *v* заделывать
embodiment *n* воплощение
emit *v* испускать
emphasize *v* подчеркивать
employ *v* использовать, применять
empty *v* выливать; впадать (*о реке*)
enable *v* давать возможность
enclose *v* огораживать, окружать
enclosure *n* загороженное место
endanger *v* подвергать опасности
energy *n* энергия
energy carrier *n* энергоноситель
engineering *n* техника; **civil engineering** гражданское строительство
enlarge *v* увеличивать (*размеры*)
enlargement *n* увеличение
ensure *v* обеспечивать
entail *v* влечь за собой; вызывать
enterprise *n* предприятие
entire *a* полный, целый
entry *n* вход
envisage *v* рассматривать (*вопрос*)
environment *n* окружающая среда; окрестность, местность
equip *v* оборудовать
equipment *n* оборудование
equal *v* равняться
erect *v* возводить
erection *n* возведение
escape *v зд.* выходить (*о воздухе*)
essentials *n* основное; предметы первой необходимости
essential *a* существенный, важный
essentially *adv* существенно; существенным образом
establish *v* устанавливать
estimate *v* оценивать, определять
evaporate *v* испаряться
event *n* событие
evident *a* очевидный
evolve *v* разрабатывать
evolution *n* развитие
examine *v* рассматривать; исследовать, изучать
excavate *v* копать, рыть
excavation *n* выемка грунта
excess *n* избыток, излишек
exclusive *adj* исключительный
exceed *v* превышать
execute *v* выполнять, осуществлять
execution *n* выполнение
exhaust *v* истощать
exist *v* существовать
expand *v* расширять(ся)
expansion *n* распространение, рост
expect *v* ожидать
expensive *a* дорогой
experience *n* опыт
exploration *n* исследование
expression *n* выражение; изображение
expressive *a* выразительный
extend *v* расширять
extensive *a* обширный
extent *n* пространство, протяжение, степень; **to the extent (to ... extent)** до такой степени
extraction *n* извлечение; добывание; добыча
extravagant *a* непомерный
extreme *a* крайний, чрезвычайный
extremely *adv* чрезвычайно, крайне

Ff

fabric *n* ткань
face *v* стоять лицом к (перед)
facilitate *v* облегчать
facilities *n* оборудование
failure *n* авария; разрушение
fan *n* вентилятор
faulty *a* ошибочный
favour *n* благосклонность
favourable *a* благоприятный
feature *n* особенность, черта
feed *v* снабжать; питать
find out *v* разузнавать, выяснять
fix *v* устанавливать, закреплять
fixed *a* неизменный, установленный

flexible *a* гибкий
float *v зд.* быть на плаву
float in *v зд.* вводить на плаву
flood *n* паводок
flourish *v* разрастаться
flow *n* поток
fluid *n* жидкость; жидкая среда
flushing *n* поток; **street-flushing operations** поливка улиц
follow *v* следовать
(the) following следующее
foot per minute фут в минуту
force *n*; *v* сила; заставлять; стимулировать
forecast *n*; *v* предсказание; прогноз; предсказывать; прогнозировать
foreign *a* инородный
forget *v* забывать
form *v* создавать; составлять, образовывать
formation *n* система
former (the former) *a* первый (*из двух*)
formerly *adv* ранее, прежде
fortress *n* крепость
foul *v* загрязнять(ся)
fraction *n* доля
frame *n* каркас
freedom *n зд.* свободное пользование
frequency *n* частое повторение
frequently *adv* часто, обычно
fresh *a* свежий
fuel *n* топливо; **fossil fuel** *n* ископаемое топливо
fume *n* сильный, резкий запах; дым
function *n*; *v* назначение, деятельность; действовать; работать
fund *n* фонд (*денежный*); капитал
further *a* дальнейший; дополнительный
further *v* содействовать
furthermore *adv* к тому же, кроме того

Gg

gate *n* ворота; шлюзные ворота
generate *v* вырабатывать, производить
generation *n* поколение; генерирование (*энергии*)
generator *n* генератор, источник энергии
goods *n* товары
gravel *n* гравий
gravity *n* сила тяжести
ground *n* грунт; площадка; **testing ground** испытательная площадка
grow *v* расти
growth *n* рост
guarantee *v* обеспечивать
guide *v зд.* быть руководителем
gypsum *n* гипс

Hh

handle *v* обрабатывать
handling *n* обработка грузов
happen *v* происходить
harbour *n* гавань, порт
harden *v* затвердевать, твердеть
rapid-hardening *a* быстро твердеющий
harm *v* наносить ущерб
harmful *a* вредный
harmonious *a* гармоничный
harness *v* использовать как источник электроэнергии
hazardous *a* опасный
head *n* напор (*воды*)
health *n* здоровье
heat *n*; *v* теплота; нагревать
heater *n* радиатор
heating *n* отопление; нагревание
height *n* высота
hence *adv* следовательно
high *a* высокий
hoist *v* поднимать
hold *v зд.* занимать
hole *n* отверстие; **water-hole** колодец
hollow *a* пустотелый
housing *n* жилищное строительство
human *a* человеческий
humanity *n* человечество
humidifier *n* увлажнитель
humidity *n* влажность
hydraulic *a* гидравлический, гидротехнический
hydropower *n* энергия воды

Ii

i.e. *лат.* то есть, а именно
ignore *v* отвергать, пренебрегать, игнорировать

inch (per square inch) дюйм (на кв. дюйм)
imagination *n* воображение
imagine *v* воображать
imitate *v* подражать
immediate *a* немедленный, безотлагательный
immediately *adv* немедленно
impervious *a* непроницаемый
imply *v* значить, подразумевать
impound *v* запруживать (*воду*)
impressive *a* впечатляющий
improve *v* улучшать
improvement *n* улучшение, совершенствование
inaccuracy *n* неточность
include *v* включать
income *n* доход
incorporate *v* включать (*в состав*)
increase *v* увеличивать(ся), возрастать
indispensable *a* необходимый
indicate *v* указывать
inevitably *adv* неизбежно
inherent *a* неотъемлемый
influence *n*; *v* влияние; влиять
ingredients *n* составные части
inland *a* материковый
inquire *v* расследовать, исследовать
iron *n* железо
insignificant *a* несущественный
install *v* устанавливать
installation *n* установка
instance *n* пример; **for instance** например
insufficient *a* недостаточный
intake *n* водозабор
integral *a* неотъемлемый
integrate *v* составлять единое целое
intelligence *n* ум, интеллект
intend *v* намереваться
interaction *n* взаимодействие
intercourse *n* общение
interior *a* внутренний
internal *a* внутренний
interrelate *v* взаимосвязывать
introduce *v* вводить
investigation *n* исследование
investment *n* капиталовложение
involve *v* вовлекать, включать
issue *n* спорный вопрос; проблема

Jj

jack *n* домкрат
jetty *n* причал; **oil jetty** нефтяной причал
joint *a* совместный
junction *n* узел (*дорог*); соединение
justice *n* справедливость; **to do justice** отдать должное
justification *n* оправдание, обоснование

Ll

labour *a* рабочий; **labour force** рабочая сила
lack *n*; *v* (полное) отсутствие; недостаток; испытывать недостаток; **for lack of** из-за недостатка
land *v* причаливать
landslide *n* оползень
lake *n* озеро
last *v* сохраняться; быть достаточным
latter *a* последний (*из двух названных*)
law *n* закон
layer *n* пласт, слой
layout *n* планировка
lay down *v* прокладывать
lead *v* вести; приводить (*к чему-л.*)
leakage *n* утечка
(at) least по крайней мере
leave free *v* освободить
length *n* длина
level *n*; *v* уровень; **level of living** жизненный уровень; выравнивать
lift *n*; *v* подъем; поднимать
likewise *adv* также
like *adv* подобно
lime *n* известь
limit *v* ограничивать
limited *p.p.* ограниченный
link *v* связывать
liquid *n* жидкость
list *v* вносить в список
load *n*; *v* нагрузка, груз; нагружать
locality *n* местность
location *n* местоположение; расположение
lock *n* шлюз

long-range = **long-term** *a* долгосрочный
loss *n* потеря

Mm

main *a* главный
maintain *v* поддерживать, сохранять
maintenance *n* поддержание; эксплуатация; **maintenance costs** эксплуатационные расходы
major *a* основной, главный
management *n* управление
managerial *a* управленческий
mankind *n* человечество
manufacture *v* производить, изготовлять
map *n* карта
marine *a* морской
marked *a* заметный, значительный
master plan генеральный план
masonry *n* каменная *или* кирпичная кладка
matter; as a matter of fact фактически; на самом деле; **no matter what** несмотря ни на что
mean *v* иметь в виду, значить
means *n* средства; **by means of** при помощи, посредством
meaningful *a* многозначительный
measure *v* измерять
medieval *a* средневековый
medium *n* среда
meet requirements удовлетворять требованиям
mention *v* упоминать
mere *a* простой, *зд.* только лишь
mind *n* ум; **in public mind** по мнению общественности; **to smb's mind** по чьему-л. мнению
mix *n* смесь
mixture *n* смесь
mode (of operation) *n* метод, режим, способ (*работы*)
modify *v* изменять
moisture *n* влага
moreover *adv* более того
mortar *n* строительный раствор
most *в грам. знач. сущ.* большинство
mostly *adv* главным образом
motion *n* движение
move *n*; *v* движение; двигаться, передвигаться
movement *n* движение; перемещение
mould *n*; *v* форма; формовать
mount *v* монтировать, устанавливать
mutually *adv* взаимно

Nn

namely *adv* а именно
navigation *n* судоходство
necessity *n* необходимость
need *n*; *v* потребность, нужда; нуждаться (*в чем-л.*); **to meet the needs** удовлетворять потребности
neglect *n* запущенность
neighbourhood *n* микрорайон, жилой район
neighbourly *a* добрососедский
noble *a* благородный
nuclear *a* ядерный
number *n* некоторое количество; ряд
note *v* отмечать

Oo

object *n* цель; предмет; элемент
objectionable *a* нежелательный
objective *n* цель
obstruction *n* помеха, препятствие
obtain *v* получать, приобретать; достигать
obvious *a* очевидный
ocean *n* океан
occupant *n* *зд.* житель
occur *v* происходить, случаться, иметь место
odour *n* запах
offensive *a* неприятный; отвратительный
offshore *a* находящийся в открытом море
offsite вне строительной площадки (заводской)
oil *n* нефть
only *a* единственный
operate *v* работать; приводить в действие
operation *n* работа; действие

opportunity *n* возможность
in order to для того, чтобы
ordinary *a* простой, обыкновенный, обычный
origin *n* происхождение
original *a* первоначальный
otherwise *adv* иначе, в противном случае
outlet *n* водовыпуск, сброс
outline *v* наметить в общих чертах
output *n* производство, выпуск
overcrowding *n* перенаселенность
overflow *v* переливаться
own *a* свой, собственный
owing to *prep* благодаря, вследствие

Pp

palatable *a* вкусный; приятный
panel *n* панель
part *n* деталь; часть
particle *n* частица
particular *a* особый, особенный; отдельный
particularly *adv* особенно, в особенности
pass *v* проходить; быть принятым, получать одобрение (*о законе и т. п.*)
paste *n* тесто; тестообразная масса
pattern *n* образец, модель; схема
penetrate *v* проникать
percolate *v* просачиваться; фильтровать
perform *v* выполнять, исполнять
permanent *a* долговременный
permanence *n эд.* прочность
permit *v* позволять, разрешать
pier *n* пирс, пристань
pipe *n* труба
pipeline *n* трубопровод
place *n* место; **to take place** случаться, иметь место
place *v* помещать
plain *a* простой; неармированный
plant *n* завод; парк строительных машин; установка
plant *a* растительный
plaster *n* штукатурка
plastics *n* пластмассы
pollute *v* загрязнять
pollution *n* загрязнение
pool *n* водоем; бассейн
population *n* население
possess *v* обладать, владеть
possible *a* возможный
potential *a* возможный
power *n* мощность; энергия; **power station** электростанция
power *v* приводить в действие
precast *a* предварительно изготовленный, сборный
precede *v* предшествовать
precipitate *v* осаждаться, выпадать в виде атмосферных осадков
precipitator *n* электрофильтр
precise *a* точный
predict *v* предсказывать
prediction *n* предсказание
prefabricated *a* заводского изготовления; сборный
prefabrication *n* заводское изготовление
prefer *v* предпочитать
preference *n* преимущество, предпочтение
preliminary *a* предварительный
premises *n* сооружения, здания
to be preoccupied *v* заниматься
prepare *v* изготовлять
preparation *n* приготовление; подготовка
preservation *n* сохранение
pressing *a* неотложный, настоятельный
prestressed *a* предварительно напряженный
prevail *v* преобладать
prevent *v* предотвращать
primary *a* первичный; первостепенный
prime *a* первостепенный, основной
previous *a* предыдущий
private *a* частный, личный
process *n* процесс
processing *n* обработка; **food processing** обработка пищевых продуктов
produce *v* производить, вырабатывать
production *n* производство
project *n*; *v* проект; проектировать; выступать
prominent *a* выдающийся
properly *adv* должным образом, правильно

promote *v* способствовать, содействовать
proper *a* должный; правильный
property *n* свойство
proposal *n* предложение
prospect *n* перспектива
protect *v* охранять, защищать
protection *n* защита; охрана
prove to be оказываться
provide *v* обеспечивать; предоставлять, давать
provision *n* обеспечение
proximity *n* близость
pump *n*; *v* насос; качать
pure *a* чистый
purification *n* очистка
purity *n* чистота
purpose *n* назначение; цель

Qq

quality *n* качество
quantity *n* количество
quay *n* пристань; набережная
quiet *a* тихий, спокойный

Rr

radiant *a* лучистый
raise *v* поднимать
range *n* предел, диапазон
rank *v* относить к какой-л. категории
rapid *a* быстрый
rapidly *adv* быстро
rapid-hardening *a* быстротвердеющий
rate *n* скорость; темп; **at a rate** со скоростью
raw *a* сырой, необработанный
ray *n* луч
reach *n*; *v* размах, взлет; доставать, достигать
readily *adv* легко
realize *v* ясно понимать; реализировать
reason *n* причина; основание
receive *v* получать, принимать
recent *a* последний, недавний
recently *adv* недавно
recognize *v* признавать
recreation *n* отдых
reduce *v* уменьшать, понижать
refer to *v* иметь отношение, относиться
with reference to с учетом, со ссылкой на
refinement *n* усовершенствование; уточнение
refrigeration *n* охлаждение
refrigerator *n* холодильник
refuse *n* мусор; отбросы
regard *v* рассматривать, считать
with regard to в отношении; что касается
regardless *adv* независимо от, не взирая на
reinforced *a* армированный; усиленный
reinforced concrete *n* железобетон
reinforcement *n* арматура
reinterpretation *n* новое толкование
to be related *v* быть связанным
relation *n* отношение; **in relation to** относительно
relationship *n* отношение
relative *a* относительный
relatively *adv* относительно
reliable *a* надежный
rely *v* полагаться, надеяться
remain *v* оставаться
remember *v* помнить, вспоминать
remote *a* отдаленный
removal *n* устранение, удаление
remove *v* удалять
render *v* исполнять, приводить в какое-л. состояние
renew *v* возобновлять, обновлять
repair *n* ремонт
repetition *n* повторение
replace *v* заменять; возвращать на место; вытеснять
represent *v* представлять
require *v* требовать
requirement *n* потребность; требование
requisite *a* необходимый, требуемый
research *n* исследование, изыскание
research *v* исследовать
reservoir *n* водоем; водохранилище
residential *a* жилой
resistance *n* стойкость; сопротивление
resistant *a* стойкий; прочный
resources *n* ресурсы, возможности
respect *v* уважать; соблюдать;

иметь отношение; **with respect to = in respect to** в отношении, что касается
responsibility *n* ответственность
result *n* результат, исход; **to result in** *v* приводить к, давать в результате
retaining wall *n* подпорная стена
retract *v* втягиваться
reveal *v* открывать, обнаруживать
reverse *n* обратное направление (реверс)
revolve *v* вращать(ся)
rigid *a* жесткий; *зд.* строгий
rise *n* подъем; **to give rise to** давать повод
road *n* дорога
rock-like *a* камнеподобный
rod *n* стержень; прут
rope *n* канат; трос
rotate *v* вращать(ся)
route *n* путь; маршрут
run off *n* сток (*воды*)
run out *v* истощаться
rural *a* сельский

Ss

safe *a* надежный; безопасный
safety *n* надежность; безопасность
(the) same тот же самый
sanitary *a* гигиенический
sanitation *n* оздоровление; улучшение санитарных условий
satisfaction *n* удовлетворение
satisfactory *a* удовлетворительный
satisfy *v* удовлетворять
saturate *v* насыщать
saturated *a* насыщенный
save *v* экономить
scale *n* масштаб; **large-scale** широкомасштабный
search *n* поиск; исследование
security *n* безопасность; надежность
select *v* выбирать
selection *n* выбор
scientific *a* научный
semi- полу-
semi-rigid *a* полужесткий
sense *n* смысл, значение; **in any sense** в любом смысле; **in the same sense** в том же самом смысле
scope *n* размах; объем (*использования*)
separate *v* разделять(ся), отделять(ся)
serve *v* служить, обслуживать
set *v* схватываться (*о бетоне*)
settle out *v* осаждаться, давать осадок
settle on *v зд.* опускаться на
sewage *n* сточные воды
sewerage *n* канализация
sewer *n* канализационная труба
shape *n* форма; очертание; **to take shape** принять определенную форму
shadow *n* тень
shelter *n* укрытие, кров; защита; убежище
shelter *v* давать приют, служить убежищем; защищать
shipbuilding *n* судостроение
shopping centre торговый центр
shortage *n* недостаток, нехватка
shore *n* берег (*морской*)
shovel *n* лопата; совок
significant *a* важный, значительный
significance *n* важность, значение
signify *v* значить, означать
single *a* один, единственный
simultaneously *adv* одновременно
simulate *v* воспроизводить; походить (*на что-л.*)
similar *a* подобный, схожий
since *cj* с тех пор как; так как
site *n* строительная площадка; **site planning** планирование работ на стройплощадке
situated *a* расположенный, находящийся в каких-л. условиях, обстоятельствах
size *n* размер; величина
skill *n* искусство, мастерство
skilled *a* квалифицированный
skyscraper *n* небоскреб
slab *n* плита
slag *n* шлак; окалина
slope *n*; *v* наклон; клониться, иметь наклон
society *n* общество
social *a* общественный
soil *n* почва; грунт
solve *v* (раз)решать (*проблему*)

solar *a* солнечный
solid *a* твердый; сплошной; цельный
solution *n* решение, разрешение (*проблемы и т. п.*)
somewhat *indef. pron*; *adv* что-то; кое-что; до некоторой степени
source *n* источник
space *n* пространство
speed *n* скорость
speedy *a* быстрый, скорый
spillage *n* утечка (*нефти*)
spillway *n* водослив
in spite of несмотря на
spring *n* родник, ключ
stability *n* устойчивость
stable *a* устойчивый
standard *a* типовой, нормальный; **standard of living** жизненный уровень
standpoint *n* точка зрения
state *n*; *v* государство; состояние; заявлять
statement *n* утверждение, заявление
supply *n* подача (*воздуха*); снабжение
support *n*; *v* опора; поддерживать, быть основанием
supreme *a зд.* наиболее важный
survey *n* топографическая съемка
survive *v* уцелеть; продолжать существовать, выжить
survival *n* выживание
suspended *a* взвешенный (*хим.*)
surround *v* окружать
surrounding(s) *n* окружение

Tt

task *n* задача
technique(s) *n* метод(ы)
technology *n* техника
tenant *n* жилец, житель
tend *v* иметь тенденцию
tensile *a* растягивающий
tension *n* растяжение
term *n*; *v* срок; называть; **in terms of** в смысле; с точки зрения
terminal *n* порт приписки
test *n* испытание
therefore *adv* поэтому
thermal *a* тепловой
thorough *a* тщательный
thoroughly *adv* тщательно
threaten *v* угрожать
thus *adv* таким образом, так
tide *n* отлив, прилив
tight *a* плотный
timber *n* дерево; лесоматериал
time-consuming отнимающий много времени
total *a* общий, весь
tower *n* башня
trade *n* торговля
traffic *n* дорожное движение, перевозки; **through traffic** сквозное движение
training *n* обучение, подготовка
transformation *n* реконструкция, преобразование
transmission *n* передача
transmit *v* передавать
treat *v* обрабатывать
treatment *n* обработка; очистка
trench *n* канава, траншея
trend *n* направление, тенденция
true *a* справедливый; истинный, настоящий
turbine *n* турбина; **reversible turbine** обратимая турбина (турбонасос); **reaction turbine** реактивная турбина
turn (on, off) *v* включать; выключать; **in turn** в свою очередь
type *n* вид, тип

Uu

ultimate *a* предельный
undergo *v* подвергаться, претерпевать
undersoil *n* подпочвенный слой
uniform *a* однородный; одинаковый
unifying *a* объединяющий
unit *n* элемент; установка; блок
unless *cj* если не, пока не
unlike *adv* в отличие от
urban *a* городской
urgent *a* срочный; крайне необходимый
urgently *adv* крайне важно
use *n* применение, использование
utilize *v* использовать

Vv

valley *n* долина
value *n* значение; ценность
valuable *a* ценный
variable *a* переменный
variation *n* вариант; различие
variety *n* разнообразие
various *a* разнообразный, различный
vary *v* различаться, изменяться
volume *n* объем
valve *n* вентиль
vapour *n* пар
vast *a* обширный
vehicle *n* машина; транспортное средство
(the) very *a* самый; предельный
vessel *n* судно
view *n* цель; **with a view** с целью; **from the point of view** с точки зрения
violence *n зд.* интенсивность
visible *a* зримый, очевидный
visually *adv* зрительно, наглядно
vital *a* жизненно необходимый, важный
volume *n* объем

Ww

want *n* недостаток; **for want of** из-за недостатка
running water водопровод
water-hole *n* скважина *(водоносная)*
water sources водные источники
watertightness *n* водонепроницаемость
waste *n* отходы, отбросы; бесполезная трата
way *n* путь; способ; **in such a way** так; таким образом
well *n* колодец; **drilled well** артезианский колодец
as well as а также, так же как и
as well также, кроме того
weigh *v* взвешивать; **weigh against** сравнивать
weight *n* вес
whatever *a* какой бы ни
wheel *n* колесо
whereby *adv* посредством чего
wherever *cj* где бы (то) ни было
(the) whole *n* целое; все; **as a whole** в целом
whole *a* весь, целый
wholesome *a* полезный
wide *a* широкий
width *n* ширина
will *n* воля
winch *n* лебедка
wise *a зд.* разумный
withstand *v* выдерживать, сопротивляться
wood *n* дерево; лесоматериал
workability *n* обрабатываемость

Xx

x-rays *n* рентгеновские лучи

Yy

yard *n* площадка, завод для отливки железобетонных изделий

ПРИЛОЖЕНИЕ I

К УПРАЖНЕНИЯМ ПО РАЗВИТИЮ НАВЫКОВ АУДИРОВАНИЯ

К разделу II — 1A, упр. 16.

1. Housing construction in the USSR is one of the main social programmes. The construction industry builds about 2 million new apartments every year (more than in any other country) and is considerably ahead of population growth. 23 years ago the then British Prime Minister, Harold Wilson called the rent in the USSR a great revolution. Since then 80 per cent of the Soviet people have improved their housing conditions. Rent remained the same even though the degree of comfort, which means additional state spending, has grown considerably.

2. A new type of technology is being used to test the weather-proof of the buildings. These are climate chambers that can imitate tropical rain, arctic frosts (down to —70°C), and extreme heat (up to +300°C). In them, various building materials can be tested very fast. Thirty years ago there was no equipment like that and the whole building had to stand the test of weather in the ordinary way.

К разделу III — 1A, упр. 17.

In the ten years from 1950 to 1960 prestressed concrete ceased to be an experimental material and engineers won confidence in its use. With this confidence came an increase in the use of precast prestressed concrete particularly for long-span floors or the decks of motorways. Wherever the quantity to be made was large enough, for example in a motorway bridge 500 m long, it became economical to use factory-precast prestressed beams. Most of these beams are heat-cured so as to free the forms quickly for re-use. In this period also precast prestressed roof beams and floor beams were used in many school buildings 32 m long or more. Such long beams over a single span could not possibly be successful in reinforced concrete because they would have to be much deeper and much heavier than prestressed concrete beams. They would certainly be less pleasing to the eye and often more expensive than

the prestressed concrete beams. The factory precasting of long prestressed concrete beams is likely to become more and more popular in the future, but one difficulty will be road transport. As the length of the beam increases the only suitable time for it to travel is in the middle of the night when traffic is at a minimum.

К разделу III — 2А, упр. 12.

Mobile Cranes with Telescopic Booms

There has been a rapid development of mobile cranes with telescopic booms in the last decades. This type of boom consists of several rectangular hollow steel sections of decreasing size starting from the lowest section, so that they can slide, one within another, to increase or decrease the length of the boom, thus varying the load-lifting capacity of the crane. The telescopic action is performed by a separate hydraulic ram for each moving section. The boom is lifted or lowered by one or two hydraulic rams.

The telescopic boom enables the crane to be brought into action from the travelling position in a few minutes.

The weight of the telescopic boom for a given load-lifting capacity is greater than that of any other type of ordinary boom. That is why there is now a tendency towards the use of lattice construction for sliding sections so as to reduce the weight of the boom.

К разделу IV — 1А, упр. 16.

Homes in most Soviet cities are heated by a modern system of central heating. Such a system was in operation in about 1,000 Soviet cities in 1982. Heat is piped to apartments in an underground network, that resembles a subterranean city. Central heating not only keeps homes well-heated at a cheap cost, it also considerably reduces fire hazards. The tragic fires which sweep cities in the U.S.A. are unheard of in the Soviet Union. In Yakutsk where 40 degrees below zero is a normal temperature and the ground is kept permafrost, heat is transmitted through overhead metal pipes specially treated to withstand intense cold. Homes there are kept comfortably warm at +20 degrees Centigrade. In Moscow, buildings and homes are maintained and serviced by a force of over 100,000 workers. It is their responsibility to see that winterizing is properly done and heating systems are kept in good order before winter comes.

К разделу IV — 2B, упр. 5.

In medieval Britain many of so-called "wells" were untouched pools or gushing springs. The same applies of course to a great many wells of the East and in old books the term "well" may not mean a dug well at all but a surface pool adopted as a communial water supply.

The history of conduits or public fountains as communial water supplies starts in the 13th century.

Until modern times in many parts of the country the question of water supply continues to be a problem. At York for example before the formation of the present water company the city was supplied with water for 2 hours every second day.

К разделу IV — 3A, упр. 12.

Drainage, Sewerage and Sewage

Drainage is a general term applied to fluid flow along all pipes or open channels which takes liquid wastes or rain water. A land drain is usually a pipe buried in farm land but it may also be an open channel. In a dry hot climate, drains are rarely needed, and irrigation channels or pipes bring water to the fields instead of taking it away.

Sewage however is rather different. It is the liquid, usually domestic wastes from a community, and it must be carefully distinguished from sewerage. Sewerage means mainly the pipes or drains which carry sewage but can include all: sewage collection, treatment and removal.

Sewerage systems are either "separate" or "combined". In separate systems the rain water is passed through a different drain from the sanitary sewer containing the sewage and they are therefore more expensive than drains but the sewage treatment is easier.

К разделу V — 1A, упр. 13.

In some parts of our country, like Turkmenia, there is a great need in drinking water. They are parts covered with sand and called deserts.

Solar energy is becoming very helpful to those working in the deserts of Turkmenia where water means life. Solar energy evaporators of small size have been tested to produce drinking water, and each unit produced up to five cubic metres of water daily. On sunny days the evaporator is run on solar energy, in cloudy weather it uses the exhaust gases of diesel engines.

The evaporators have proved that they can be very useful and economical in distant areas of our country. As to solar energy which has been attracting our attention lately, it is clear that it can be used for the benefit of man and can be his ally.

К разделу VI — 1А, упр. 19.

The main demands that an earth dam must meet are its stability and strength which are provided by a well-prepared foundation and watertightness of the structure. Otherwise, failure may occur as was the case with a dam near Los Angeles in 1963.

In the lower part of the dam a serious leakage was noticed and four hours later the bank failed completely and the whole reservoir was empty.

As the inspection after the failure showed the cause of the failure was the poor geology of the site which resulted in a slow ground movement during the 13 years of the dam operation. The reservoir had settled about one foot. As a result the layer of asphalt that was placed on the bottom of the reservoir against leakage broke, and this allowed increased filtration through the dam body.

This event stressed the necessity of detailed geological studies in the selection of the dam site. They must determine whether the foundation can safely withstand the load of a large dam and the mass of reservoir water.

К разделу VII — 1А, упр. 17.

With the growth of the need for more and more fuel the geologists turned to the seas. New oil reserves have been found on the sea and ocean bottoms and this resulted in developing new marine structures—oil producing platforms supported by strong piers. The task is made more difficult due to the fact that such platforms are to be built in the North in freezing seas.

This involves the consideration and analysis of new load problems. The presence of ice fields makes the behaviour of the structure in the open sea very complicated. It is subjected to loads due to horizontal movements of ice fields, to vertical loads of ice due to the changes of the sea level, and it is affected by the physical properties of the ice.

Thus the choice of the construction type in designing such offshore platforms is rather a difficult task and demands a serious analysis of the conditions of the region where the structure is to operate.

К разделу VIII — 1А, упр. 16.

An Interview with Mr Wright, an Outstanding American Architect

Interviewer: Would you recount for us, Mr Wright, some of the things which are fundamentally your own innovations in architecture?

Wright: Well, it would be rather difficult—a long story, too—perhaps too long for this occasion. First of all came this new sense of space. Then there was the open plan—instead of a building being a series of boxes and boxes inside boxes it became more and more open—more and more aware of space. That increased until we had practically a new floor plan. It has been referred to always as "the open plan". That was one direct result.

And in the structural sense, a great many new features arose, like, well perhaps the most important one—gravity heat (floor heat), where the heat is underneath the floor slab, hot-water pipes embedded in broken stone. With a thick rug on the floor you have a reservoir of heat underneath you.

Interviewer: I've heard indirect lighting attributed to you.

Wright: Yes, I did the first so-called indirect lighting very, very early. About fifty years ago, I guess. Incorporated light behind shelves, cast light from the floor on ceilings, then burying it in the ceiling in various ways as recessed lighting shining on walls. Doing then, I suppose, nearly everything being done today. I don't know of anything radically new.

К разделу VIII — 2А, упр. 13.

As a result of new economic and social forces, the nineteenth century witnessed a multiplication of cities, a transformation of their physical utilities, and an unparalleled increase in their size—in population, in area, and often in density. The typical city of the Middle Ages, outside Italy, held less than fifteen thousand people—and often less than five thousand—though Marco Polo * had brought back from China accounts of cities with a million inhabitants. As a result of the expansion of financial, industrial, and political power from the year of 1500 onwards, the newer centres often had more than a hundred thousand people. In the nineteenth century,

*['ma:kou 'poulou]

cities of a hundred thousand became common and those of a million, like London, Paris, and Berlin, became possible. Indeed the forces that created giant cities were in operation before the technical means to make them habitable were available: London had a million inhabitants at a time (in 1800) when in many quarters the water supply was turned on only twice a week.

ПРИЛОЖЕНИЕ II

ЗАДАНИЯ ПО КОНТРОЛЮ НАВЫКА ЧТЕНИЯ

К разделу I

1. Прочтите текст, укажите, какие дополнительные сведения приводятся в нем относительно следующего утверждения: 'Town planning requires research of the trends of the population growth'.

Planning

Planning, or town and country planning, is the control of the locations of towns, of industry, shops, housing, railways, parks, lakes, schools, universities and of the roads and railways to them. Zoning means the planning decisions which have been made and drawn out on maps, showing which area or zone is for heavy or light industry or for housing or so on.

There are many professions among practising planners, including lawyers, architects, agriculturists, economists, scientists, public health doctors and engineers. A civil engineer is probably the most suitable person to locate a town site, apart from such purely civil engineering structures as reservoirs, railways, roads and so on, which only a civil engineer can locate.

The past growth of the population must be studied carefully with all known plans for future industrial development for at least the next twenty-five years, so as to predict with some accuracy the population growth. It is also helpful to know, based on the last count of the population, what its age grouping is. The water engineers and sewage treatment engineers of any area will, with the planners, be particularly interested in any forecasts of population growth.

2. В соответствии с текстом скажите, к какому понятию относится данное определение: 'It means showing on maps which areas are to locate housing or different kinds of industry'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

К разделу II — 1А

1. Прочтите текст, сопоставьте его с 4-м и 5-м абзацами текста "Residential and Industrial Buildings" и укажите, какие уточнения даются в данном тексте относительно проектирования различных элементов зданий.

Structures

A structure is the part of a building that carries its weight, and for at least half the world's civil engineers, structures are most of civil engineering. We should also remember that anything built is a structure. (From an aeroplane engineer's point of view, an aeroplane also is a structure.) A structure may be a dwelling house, or a pyramid in Egypt, or a dam built by beavers across a Canadian river. A building is a structure with a roof and much of civil engineering structural design is the design of building structures. The building as a whole is designed by an architect, particularly in a densely populated area. Every structural design includes the foundation design. The structural design itself includes two different tasks, the design of the structure, in which the sizes and locations of the main members are settled, and the analysis of this structure by mathematical or graphical methods or both, to work out how the loads pass through the structure with the particular members chosen. For a common structure, such as a building frame, many methods have been developed for analysis, so that the design and analysis will be relatively easy and may need to be performed only once or twice.

But for any unusual structure the tasks of design and analysis will have to be repeated many times until, after many calculations, a design has been found, that is, strong, stable and lasting. For the typical multi-storey structure in a city, whether it is to be used for offices or dwellings, the most important member which the engineer designs is the floor— for two reasons: it repeats all the way up the building, and it has the greatest effect on the dead load of the building.

2. В соответствии с текстом укажите, к какому понятию относится данное предложение: '... is the weight of the structure itself'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

К разделу III — 1А

1. Прочтите текст. Сопоставьте его с 5-м абзацем текста "The Most Important and Widely Used Building Materials" и скажите, какую дополнительную информацию вы получили.

Modern Building Materials

Of the various Portland cements, the following varieties are now generally available:

a) Ordinary Portland cement, the cheapest,

b) Rapid-hardening cement, which is slightly more expensive because it is ground rather finer and is thus more chemically active,

c) Sulphate-resisting cement which has a special chemical composition to resist sulphates, and can be used in ground which contains them,

d) Air-entraining cement for building roads which may suffer from frost damage,

e) Low-heat cement for massive construction such as dams where the speed at which the heat is given off must be reduced, and slow development of strength does not matter.

These are the main Portland cements. A different cement, which should be mentioned, is high-alumina cement. High-alumina cement is usually black, unlike Portland which is grey, but it reaches a "Portland 28-day" strength in twenty-four hours with correspondingly high heating and it must therefore not be cast in masses which are thicker than 60 cm. This common high-alumina cement costs roughly three times as much as Portland. Another high-alumina cement which is used for furnace linings is white; it is several times more expensive even than the black variety. White Portland cement is also obtainable, it is more expensive than ordinary. It is used for making white concrete or for painting or plastering concrete. A small addition of colouring material to white cement will often result in a pleasing colour but it may not be the colour expected because of the effect of the aggregates and impurities in the concrete.

2. В соответствии с текстом укажите, к какому понятию относится данное определение: '... is a cement which has been ground more finely than ordinary Portland cement and therefore hardens more quickly and is slightly more expensive'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

К разделу III — 2A

1. Прочтите текст, скажите, как изменилось следующее положение: 'Earth-moving machines were mainly powered by steam'.

Earthwork

Earthwork or earth-moving means cutting into ground where its surface is too high (cuts), and dumping the earth in other places where the surface is too low (fills).

Because earth-moving methods and costs change more quickly than those in any other branch of civil engineering, this is a field where there are real opportunities for the enthusiast. In 1935 most of the methods now in use for carrying and excavating earth with rubber-tyred equipment did not exist. Most earth was moved by narrow rail track, now relatively rare, and the main methods of excavation, with face shovel, backacter, or dragline or grab, though they are still widely used, are only a few of the many current methods. At that time, the main power for excavators was steam from the coal-fired boiler, now out of use even in Britain where coal is plentiful. Internal-combustion engines are now used everywhere except on sites where electricity is available.

To keep his knowledge of earth-moving equipment up-to-date an engineer must therefore spend time studying modern machines and must seriously reconsider any methods more than a few years old. Generally the only reliable up-to-date information on excavators, loaders and transport is obtainable from the makers.

To reduce earthwork costs, the volume of the fills should be equal to the volume of the cuts and wherever possible the cuts should be placed near to fills of equal volume so as to reduce transport and double handling of the fill.

2. Скажите, к какому землеройному оборудованию относится данное определение: 'This kind of earth-moving equipment moves the greatest amount of earth over a short distance from cut to fill'.

3. Переведите текст устно без словаря. (Время — 35 мин.)

К разделу IV — 2A

1. Прочтите текст, найдите, где в нем выражена следующая идея: 'Sometimes the rainfall finds its way into the soil and forms water bodies'.

Water Supply

A water supply may be obtained from surface water (rain) or from underground water or both. Both are refilled by the rainfall, the surface water by the run-off, and the springs or wells by the water which enters the ground, the infiltration water. These two quantities, plus the evaporation water and the water used by the trees and plants, make up the total rainfall. Even if the community water supply includes all the springs as well as all the surface water in the area, it still does not obtain all the rainfall because of evaporation and the needs of plant life.

A water supply for a town usually includes a storage reservoir at the source of the supply, a pipeline from the storage reservoir to the distribution reservoir near the town, and finally the distribution pipes buried in the streets, taking the water to the houses, shops, factories, and offices. The main equipment is thus the two reservoirs and the pipeline between them. The function of the storage reservoir is to keep enough water over one or several years to provide for all high demands in dry periods, and the distribution reservoir has the same function for the day or the week. The storage reservoir by its existence allows the supply sources to be smaller and less expensive, and the distribution reservoir similarly allows the pipeline and pumps to be smaller and cheaper than they would be if it did not exist.

2. В соответствии с текстом скажите, определением какого оборудования является следующее предложение: 'This equipment delivers water to different kinds of buildings'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

К разделу IV — 3А

1. Прочтите текст, сопоставьте его с 6-м абзацем текста "Sewerage", укажите, какую дополнительную информацию вы получили относительно обработки сточных вод.

Drainage, Sewerage and Sewage

Sewerage systems are either "separate" or "combined". In separate systems the rainwater is passed through a different drain from the sanitary sewer containing the sewage, and they are, therefore, more expensive in drains but the sewage treatment is easier. In a separate system the sewage flow is the dry-weather flow.

Several house drains flow into the street sewer. Several of these flow into a branch sewer, which joins first a submain and then a main sewer taking it to the treatment plant. From the treatment plant water flows as effluent.

In a country district the sewage can be treated by spreading it over farm land, a method that is simple and cheap. Although the amount of solid matter in sewage is less than 0.1 per cent, the first task in the sewage treatment itself is to separate the solids from the liquid. Coarse solids are removed by coarse filters, floating solids are removed by skimming tanks, and fine solids by finer filters, sedimentation tanks or contact aerators or other treatments. The water after further purifi-

cation, which may include chlorination or oxidation by various means, flow off to the river or the sea, or for re-use as industrial water.

2. Скажите, описанием какого термина является следующее предложение: 'It is the final liquid product of a sewage treatment plant'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

К разделу VI — 1А

1. Прочтите текст. Сопоставьте его с 5-м абзацем текста "Water-Power Development— Integral Part of Civil Engineering" и укажите, какую дополнительную информацию вы получили.

High proportion of hydropower in the electric system makes its operation more reliable and stable. The principal change in the pattern of water-power generation during the past decade concerns advances made in the development of pumped-storage techniques. Installations of this type now rate among the most powerful hydroplants in the world. It is expected that pumped-storage stations operated in combination with nuclear stations will carry loads of fairly long peak periods. The reservoir capacity for pumped-storage generation will have to be sufficient for these much longer periods of operation than now.

In some countries it is difficult to find sites where high enough head and much water can be utilized. Some new solutions are to be found. In Japan, for instance, an interesting idea was proposed to construct a sea-water pumped-storage station with the ocean as a lower basin. As a result of a topographic investigation a site near Atashika was considered suitable for a high head and a reservoir located 470 m above the sea level, with plant capacity of 2000 MW.

2. Укажите, какому термину соответствует данное определение: '... is — water pressure created by the difference in the upstream and downstream water levels'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

К разделу VII — 1А

1. Прочтите текст. Сопоставьте его с 5-м абзацем текста "Ports — Means of Outside Communication" и отметьте, какую дополнительную информацию вы получили.

Oil docks differ from other berthing structures with general cargo handling equipment. A pier of full length and width is not economical for this purpose since the required area of solid deck is relatively small as oil is usually unloaded

at a fixed point and transferred to and from the shore by pumping through submarine pipelines.

The increase in size of tankers causes limitations on the use of conventional shore berthing structures for the water depth is often insufficient for the supertankers to operate safely when fully loaded. This gave rise to an idea of locating new ports or separate berths on natural or artificial islands which has some economic advantages in reducing the volume of dredging. These islands are connected with the shore by a trestle carrying a pipeline for the oil transportation to the shore, or large storage facilities are located on these islands for the oil to be pumped from the tankers.

Another method of berthing and transferring liquid cargoes is offshore anchorage. It is important that the ship keep more or less fixed position during the operation against the forces of the wind, current and waves. This is achieved by the tanker's anchors combined with sea anchorage devices.

2. Укажите, какому термину соответствует данное определение: '... is a structure projecting from the shore into the water allowing berthing on its two or three sides'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

К разделу VIII — 1А

1. Прочтите текст, найдите, как выражена в нем следующая идея, и скажите, в чем сходство и различие этих двух трактовок: 'Nearly two thousand years ago the Roman architect Vitruvius listed three basic factors in architecture—convenience, strength and beauty. These three factors are always present and interrelated in the best structures'.

Architectural Design

In 1624 Sir Henry Wotton, an English architect, stated the requirements of good architecture in three words, "commoditie, firmeness and delight".

This covers the ground today as it did 300 years ago. A building that is commodious in the sense of being suitable and sufficient for the intended use, one that will withstand the effects of nature and the loads and strains to which it is subjected, and that is pleasing to the intelligent observer, represents good architecture. None of the three primary elements are independent of the others. The plan must be sufficiently flexible to meet the demands of stability and appearance.

A design must declare its intention, so far as possible. It should indicate the character of the building as political,

religious, domestic, etc. In the expression of this lies a good measure of its success. The several parts of a design must be in harmony if not in symmetry, and in scale. Finally, good design requires grace of form, articulation of parts, dominant elements, proportion and emphasis. In their turn, these qualities are dependent upon mass, outline, colour and detail.

2. В соответствии с текстом укажите, к какому понятию относится данное определение: '... ... entails not only the study of solutions for convenience, for structure and for appearance but also a consideration of the constant interaction of these factors'.

3. Переведите текст устно без словаря. (Время — 30 мин.)

Заключительные проверочные тексты

1. Прочтите текст и затем запишите в виде таблицы основные характеристики каждой конструкции, упомянутой в тексте.

a tunnel	a bridge	a combination

A Tunnel, a Bridge or a Combination?

It was Napoleon Bonaparte who first suggested that a tunnel be built under the English channel between France and Britain. Several proposals are being studied now, including a bridge, a tunnel or a combination.

The tunnel would be prefabricated and laid on the seabed and would carry two rail lines underwater. Critics say that ventilation shafts would be needed every three or four miles and that they would create problems for shipping in the channel. Another plan is to construct a suspension bridge carrying 12 lanes or auto traffic and encased in a waterproof plastic tube. Some companies propose an opendeck suspension bridge with spans of about 2,000 yards. It would cost half as much as the bridge in a plastic tube but it would present shipping dangers.

Many transportation authorities believe that the most likely government recommendation will be a rail tunnel under the seabed. It will be six meters in diameter and would cost about 2 billion pounds. It will combine the advantages of a tunnel and a bridge. It will cause the least damage to the environment, it doesn't need any ventilation and will require no new technology.

2. Прочтите и переведите без словаря следующий текст.

Civil Engineering

Civil engineering is claimed to be "the art of directing the great sources of power in nature for the use and convenience of man" The part played by civil engineers in pioneering work and in developing wide areas of the world has been and continues to be enormous.

Civil engineers must make use of many different branches of knowledge, including mathematics, theory of structures, hydraulics, soil mechanics, surveying, hydrology, geology and economics.

Civil engineering was not distinguished from other branches of engineering until 200 years ago. Most early engineers were engaged in the construction of fortifications and were responsible for building the roads and bridges required for the movement of troops and supplies.