

Міністерство освіти і науки України  
Відокремлений структурний підрозділ  
«Любешівський технічний фаховий коледж  
Луцького національного технічного університету»



**Іноземна мова за професійним спрямуванням**  
Методичні вказівки до самостійної роботи  
для здобувачів освіти освітньо-професійного ступеня  
фаховий молодший бакалавр  
галузь знань 19 Архітектура і будівництво  
спеціальності 192 Будівництво та цивільна інженерія  
денної форми навчання

УДК

До друку

Голова методичної ради ВСП «Любешівський ТФК ЛНТУ»

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Електронна копія друкованого видання передана для внесення в репозитарій коледжу

Бібліотекар \_\_\_\_\_

Затверджено методичною радою ВСП «Любешівський ТФК ЛНТУ»

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Рекомендовано до видання на засіданні циклової (методичної) комісії викладачів соціально-гуманітарних дисциплін, фізичного виховання та захисту України

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Іноземна мова за професійним спрямуванням (англійська) [Текст]: Методичні вказівки до виконання самостійної роботи для здобувачів освіти освітньо-професійного ступеня фаховий молодший бакалавр спеціальності 192 Будівництво та цивільна інженерія денної форми навчання/ уклад. Г.В.Смоляк – Любешів: Любешівський технічний коледж Луцького НТУ, 2020. – с. 51.

Методичне видання складене відповідно до діючої програми курсу «Іноземна мова за професійним спрямуванням» з метою вивчення та засвоєння основних розділів дисципліни, містить питання до кожної з тем та перелік рекомендованої літератури.

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## ПОЯСНЮВАЛЬНА ЗАПИСКА

Самостійна робота студентів є складовою навчального процесу, важливим чинником, який формує вміння навчатися, сприяє активізації засвоєння студентом знань. Самостійна робота студентів є основним засобом опанування навчального матеріалу у позааудиторний час.

### Мета та завдання дисципліни

Дисципліна «Англійська мова» в комплексі з іншими спеціальними предметами має велике значення і посідає одне з основних місць в освітньо-професійній підготовці бакалаврів морського флоту, є невід'ємною частиною загальної проблеми підготовки висококваліфікованих фахівців для морського флоту України.

Вивчення предмету базується на принципах міжпредметних зв'язків, взаємопов'язаних видів мовної діяльності, теорії поетапного контекстного навчання. У програмі передбачено навчання відповідним алгоритмам у ситуаціях, імітуючих професійно-трудові відношення.

Дисципліна «Англійська мова» на даному етапі підготовки фахівців торговельного флоту є певною мірою узагальнюючою та систематизуючою, тому у відповідності з діючими положеннями міжнародних конвенцій, що регламентують ступінь володіння працівниками англійською мовою у професійному спілкуванні, первинне значення приділяється узагальненню вивченого в процесі навчання англійської мови на попередніх етапах підготовки, а також активізації знань зі спеціальних дисциплін.

Головна мета навчання англійської мови – забезпечити практичне володіння мовою випускниками морського навчального закладу. Поставлена мета передбачає вирішення конкретних завдань.

Завдання курсу.

- **методичні:** розвивати творче мислення при виконанні практичних завдань у спеціальних навчальних ситуаціях, які вимагають професійної компетенції фахівців морського флоту.
- **пізнавальні:** сформувати у студентів початкову теоретичну базу, загальні уявлення про специфіку спілкування на судні та у морському середовищі, які забезпечать необхідну комунікативну спроможність у сферах ситуативного і професійного спілкування в усній та письмовій формах з іноземними колегами.
- **практичні:** сформувати основи вмінь спілкування в соціально-побутових та професійно-орієнтованих ситуаціях; розвивати вміння сприймати на слух аудіо записи та відповідно реагувати на прослухану інформацію; сформувати навички читання інструкцій та текстів професійного спрямування на англійській мові; виробити навички використання оригінальної технічної літератури; розвивати вміння писати особисті та ділові листи; застосувати здобуті знання при проходженні співбесіди в компаніях та при складанні тестів.

### **Види контрольних заходів самостійної роботи**

Самостійна робота представляє собою домашнє завдання на самостійне засвоєння матеріалу, контрольну роботу, яка охоплює весь граматичний, лексичний та фактичний матеріал семестру. КР складається з наступних блоків:

- Reading

- Vocabulary
- Grammar
- Writing

## **РЕКОМЕНДАЦІЇ ДО САМОСТІЙНОЇ РОБОТИ**

Самостійна робота приведе до безумовного успіху, якщо ви оберете методику вивчення англійської мови, яка не буде сприйматися вами, як тягар і необхідність. Засвоєння відбувається значно швидше, якщо ви самі визначите найбільш прийнятний темп і самі мобілізуєте свою енергію. Щоб досягти успіху у вивченні англійської мови необхідно розпочати роботу над мовою з перших днів занять у вузі та займатися мовою щоденно. Звертайтеся до довідників, словників тощо, якщо вам незрозумілий той чи інший матеріал.

Слід відвести для самостійного вивчення англійської мови певний час дня: краще вранці, якщо ви «жайворонок», або ввечері, якщо ви «сова». Складіть графік занять, якого вам буде неважко дотримуватися. Намагайтеся вчитися у відведений час. Займатися англійською мовою слід кожний день, на тиждень можна зробити не більш одного вихідного. Щоденні, навіть не дуже довготривалі (наприклад, 20 хвилин), самостійні заняття з англійської мови значно корисніші, аніж багатогодинний «штурм» раз на тиждень. Коли рівень володіння англійською мовою наближається до середнього, скоротіть частотність занять до 2-3 раз. Лише на просунутому етапі можливі щотижневі самостійні заняття з англійської мови. Ваш розклад, швидше за все, буде змінюватися, але дотримуйтеся принципу «краще займатися часто потроху, ніж рідко і багато». Графік занять розмістіть на видному місці.

Оптимальна тривалість самостійного заняття – 60-90 хвилин на день з обов'язковим 5-10-хвилинною перервою або без перерви, якщо воно триває не довше години (сюди не повинен включатися час, відведений на запам'ятовування слів). Кожному пройденому уроку англійської мови через деякий час слід обов'язково робити 15-хвилинне повторення того нового, що було засвоєно. Вивчаючи англійську мову, перш за все, необхідно мати позитивний настрій, тобто вчитися слід починати у позитивному стані.

Фокус уваги необхідно змістити з того, що не виходить, на те, що виходить добре і краще.

Рухайтесь від простого до складного. Починайте вивчати навчальний матеріал з того, що є достатньо простим, поступово збільшуючи складність. Це дозволить вам швидко йти до мети і завжди залишатися в позитивному стані.

Зробіть комфортні умови для самостійного вивчення англійської мови: зручне робоче місце, хороше освітлення. Приємний фон створює відповідний емоційний настрій.

### **Як вивчати лексичні одиниці.**

Для того, щоб розуміти тексти та розмовляти англійською мовою, треба оволодіти великим запасом слів та виразів.

- Запам'ятовуйте слова в контексті. Тренуйте свою пам'ять на засвоєння нових слів

- Випишіть слова, які хотіли б запам'ятати. Придумайте речення або словосполучення для кожного слова
- Нові слова та вирази записуйте в зошит чи на окремих картках.
- Читайте цікаві англійські тексти, книги, літературу з фаху. Як правило, багато нових слів повторюються і запам'ятовуються мимоволі.
- Подивіться в словнику транскрипцію слова, яке ви хотіли б вивчити. І обов'язково його промовте
- Добре завчіть алфавіт: це полегшить пошук слів у словнику.
- Використовуйте нове слово в різних ситуаціях: при переказі англійського тексту, практикуючись в англійській мові з друзями, викладачами, носіями мови
- Головну увагу при вивченні англійських слів приділяйте тим, що не схожі на слова рідної мови.
- Випишіть по одному слову на невеликому листочку паперу/стікері і повісьте їх на ті місця, куди часто звертається ваш погляд. При читанні цих слів промовляйте їх, уявляйте образ
- На початковому етапі вивчення англійської мови збагачайте свій активний запас словами, що часто вживаються. Надалі віддавайте перевагу тим англійським словам, які ви активно використовуєте в рідній мові
- Запрограмуйте свою свідомість на те, що ви дійсно швидко і легко запам'ятовуєте англійські слова. Якщо ви поки не зовсім упевнені в цьому, то грайте, ніби це так і є – і ви швидко побачите результат!
- Звертайте увагу, яку лексику вживають носії англійської мови, тобто спілкуйтеся з іноземцями, дивіться англійські фільми, слухайте радіо. Мова – це дуже гнучка і рухома система, і те, що було актуальним 10 років тому, може зовсім не відповідати сьогоdnішньому дню.

Блок **Communication skills** - це всі розмовні навички, яких має здобути студент у результаті самостійної підготовки до заліку або екзамену.

### Як розвивати розмовні навички

Для того, щоб навчитися розмовній англійській мові, необхідно запам'ятати одне з найважливіших правил, про яке багато хто чомусь забуває, - це практикуватися говорити. Чим більше ви говорите англійською мовою, тим швидше ви напрацьовуєте розмовні навички.

Одним з найпростіших і ефективніших способів є принцип «що бачу, то співаю». Якщо у вас початковий рівень, то можна вголос називати предмети, що оточують вас, або промовляти короткі речення, наприклад: I go. I drink. I water plants. Одночасно ви, таким чином, тренуєте структуру англійського речення: підмет + присудок в нинішньому часі, що вивчається.

Розкажіть собі або кому-небудь про те, чим ви займалися, займаєтеся або будете займатися сьогодні, за місяць, за рік. Корисно переказувати фільми, розповіді, різні історії. А можна одну й ту ж казку переказати у трьох граматичних часах.

Можна практикувати розмовну англійську мову, промовляючи про себе різні фрази по дорозі додому або навчання.

Виберіть аудіокасету/відеокасету/диск, де дуже швидко говорять

англійською мовою, але при цьому комунікація залишається достатньо зрозумілою і використовується порівняно проста англійська лексика. Вдалими можуть бути записи CNN, де більшість дикторів говорять з великою швидкістю. Прослухайте фрагмент аудіо запису і відзначте ключові слова, фрази. Спробуйте сказати рідною мовою деякі фрази в подібному ритмі і схожою мелодикою, паузами і т.п. Включіть запис знову і намагайтеся з мінімальною затримкою в часі вимовляти фразу за фразою, скорочуючи розрив у відставанні.

### **Як працювати над текстом**

Робота над текстом має здійснюватись у такій послідовності:

- Уважно прочитайте текст, намагаючись зрозуміти його загальний зміст.
- Випишіть слова у словниковий зошит, вивчіть їх.
- Читання кожного слова перевірте за транскрипцією, яка дається у словнику.
- Якщо слово читається не за правилами, запишіть його транскрипцію.
- Поряд запишіть рідною мовою значення іноземного слова, яке найбільше підходить до даного контексту.
- Прочитайте текст ще раз, намагаючись схопити не тільки його загальний зміст, а й деталі
- Опрацюйте кожне речення тексту, щоб зрозуміти його зміст. У важких випадках проаналізуйте речення: зверніть увагу на порядок слів у реченні.

Займайтеся періодично протягом місяця. У перервах між тренуваннями застосовуйте отримані навички у спілкуванні англійською мовою з друзями, викладачами, в навчальній групі – скрізь, де це буде доречно

## **КРИТЕРІЇ ОЦІНЮВАННЯ ЗНАНЬ І ВМІНЬ СТУДЕНТІВ**

Оцінка "відмінно" виставляється студентові, який повністю виконав програму курсу, тобто виконав усі завдання передбачені програмою курсу, показав високий рівень знань теоретичного та практичного матеріалу. Для отримання відмінної оцінки студент повинен показати вміння та навички усного діалогічного та монологічного мовлення, а також письмового мовлення з використанням лексичного матеріалу курсу, розвинуті навички двостороннього перекладу, слухання, навички реферування іншомовного тексту та складання основних видів контрактів та ділових листів.

Оцінка "добре" виставляється студентові, який повністю виконав програму курсу і показав відповідний рівень знань матеріалу курсу. На оцінку "добре" заслуговує студент, який продемонстрував добрі вміння та навички аудіювання, усного і письмового мовлення з лексичного матеріалу курсу, має добрі навички двостороннього перекладу, вміє реферувати іншомовний текст та складати основні види контрактів та ділових листів.

Оцінка "задовільно" виставляється студентові, який виконав програму курсу не повністю, тобто не всі завдання, передбачені курсом "Англійська мова

професійного спрямування", було виконано повністю. На оцінку "задовільно" заслуговує студент, який має задовільний рівень мовної підготовки, який показав достатні навички реферування та складання основних видів контрактів та ділових листів.

Оцінка "незадовільно" виставляється студентові, який не виконав програму курсу, тобто не виконав завдання курсу і не продемонстрував певних знань матеріалу курсу, а також, вмінь та навичок, передбачених програмою курсу.

## Unit 1

### *I. Read the text:*

#### Parts of a building

Almost everyone has watched building of a house and followed its progress with interest.

First the excavation is dug for the basement, then the foundation walls bellow ground level are constructed; after this the framework is erected and clothed with various building materials and protected by several coats of paint.

The part upon which the stability of the structure depends is the framework. It is intended for safely carrying the loads imposed. The floors, walls, roof and other parts of the building must be carefully designed and proportioned.

The architect or designer must decide what the size of the walls, the floors, the beams, the girders and the parts which make up the framework must be, and how they must be placed and arranged. Sometimes it is done by the architect who draws the plans for the house, sometimes by a designer.

Here are the main parts of a building and their functions. Foundations are to keep the walls and doors from contact with the soil, to guard them against the action of frost, to prevent them from sinking and settling which can cause cracks in walls and uneven floors.

Floors divide the building into stories. They may be either of timber or of resisting material.

Walls are built to enclose areas and carry the weight of floors and roofs. The walls may be solid or hollow. The materials used for the wall construction can be brick, stone, concrete and other natural and artificial materials.

Roofs cover the building and protect it from exposure to weather. They tie the walls and give the construction strength and firmness.

## *II. Give Ukrainian equivalents to the following:*

progress – \_\_\_\_\_

foundation walls – \_\_\_\_\_

below ground level – \_\_\_\_\_

parts of the building – \_\_\_\_\_

the loads – \_\_\_\_\_

must be carefully proportioned – \_\_\_\_\_

to prevent them from sinking – \_\_\_\_\_

resisting material – \_\_\_\_\_

the weight of floors – \_\_\_\_\_

brick – \_\_\_\_\_

to tie the walls – \_\_\_\_\_

natural materials – \_\_\_\_\_

to protect from exposure to weather – \_\_\_\_\_

## *III. Translate the text and say whether these statements are true or false:*

1. First the excavation is dug for the framework.
2. The foundation walls are constructed above ground level.
3. The framework is clothed with various finishing materials and protected by several coats of paint.
4. The part upon which the stability of the structure depends is the basement.
5. The walls and other parts of the building must be carefully proportioned.
6. The architect must decide what the size of the floors, the beams and the girders must be.
7. Sinking and settling of a construction can cause cracks in walls and uneven floors.
8. Floors may be of timber only.
9. The materials used for the wall construction can be natural only.

10. Roofs cover the building and protect it from settling.

IV. Continue the sentence:

1. The framework is intended for safely carrying ...
  - a. the weight of the walls.
  - b. the weight of the floors and roofs.
  - c. the loads imposed.
2. Foundations guard the walls against the action of ...
  - a. sun.
  - b. frost.
  - c. thunder.
3. Floors may be ...
  - a. neither of timber nor of a resisting material.
  - b. of a resisting material only.
  - c. either of timber or of a resisting material.
4. The materials used for the wall construction can be ...
  - a. natural only.
  - b. artificial only.
  - c. natural and artificial.

V. a) Complete the table:

Noun	Verb	Adjective
—	—	finishing
protection	—	—
—	divide	—
—	—	arranged
decision	—	—
—	erect	—
—	—	used
intention	—	—

b) Choose the word from the table to complete the sentence:

1. Floors ... the building into stories.
2. The designer must ... how the beams and the girders must be placed and arranged.
3. The framework is clothed with various ... materials.
4. The materials ... for the wall construction can be natural and artificial.
5. Roofs ... the building from exposure to weather.
6. After the framework is ... it is protected by several coats of paints.
7. The architect must decide how to place and ... all the parts of the building.
8. The framework is ... for carrying the loads imposed.

VI. Scan the text and answer the questions:

1. Have you ever watched building of a house?
2. Where are the foundation walls constructed?
3. Which part of the building does its stability depend on?

4. What are the functions of the foundation?
5. What materials may be used in constructing floors?
6. What materials are used for the wall construction?
7. What's the function of the roof?

### Grammar revision:

- I. *Explain the grammar phenomena underlined in the text.*
- II. *Ask three types of questions (general, special and to the subject) to the underlined sentence in the text.*
- III. *Write these sentences in the Past and Future Simple tense forms.*
  1. The designer must determine the height of the ceiling.
  2. You can use several ways to guard the foundation from dampness.
  3. He may make all the arrangements for the presentation.
- IV. *Make this sentence passive.*

The architect calculates an estimate of the design of the building.

- V. *Open the brackets.*
  1. Scientists so far (to find) only 115 different kinds of atoms.
  2. A battery (to produce) electricity using two different metals in a chemical solution.
  3. To solve the problem of sending electricity over long distances, William Stanley (to develop) a device called a transformer.
  4. Half of the electrons (to spin) in one direction; half (to spin) in the other.
  5. The concept of electric field (to be introduced) by Michael Faraday.

## Unit 2

### I. Read the text:

#### Civil engineering

In modern usage, civil engineering is a broad field of engineering that deals with the planning, construction, and maintenance of fixed structures, or public works, as they are related to earth, water, or civilization and their processes. Most civil engineering today deals with power plants, bridges, roads, railways, structures, water supply, irrigation, environment, sewer, flood control, transportation and traffic. In essence, civil engineering may be regarded as the profession that makes the world a more agreeable place in which to live.

Engineering has developed from observations of the ways natural and constructed systems react and from the development of empirical equations that provide bases for design. Civil engineering is the broadest of the engineering fields, partly because it is the oldest of all engineering fields. In fact, engineering was once divided into only two fields - military and civil. Civil engineering is still an umbrella term, comprised of many related specialities.

### II. Give Ukrainian equivalents of the following:

- to deal (with) – \_\_\_\_\_
- a broad field – \_\_\_\_\_
- a modern usage – \_\_\_\_\_
- a construction \_\_\_\_\_

a power plant – \_\_\_\_\_  
 may be regarded – \_\_\_\_\_  
 maintenance – \_\_\_\_\_  
 bases for design – \_\_\_\_\_  
 transportation and traffic – \_\_\_\_\_  
 observations of the ways – \_\_\_\_\_  
 many related specialities – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Civil engineering deals with construction only.
2. Construction of fixed structures or public works is a part of a broad field of engineering.
3. Civil engineering makes the world a more attractive place to live in.
4. Civil engineering is a new field of engineering.
5. Civil engineering is only a small part of all engineering fields.
6. Engineering was once divided into only two fields.
7. Observations of the ways natural and constructed systems react gave development to the engineering.

*IV. Continue the sentence:*

1. Civil engineering is a broad field of engineering that deals with ...
  - a. the planning of fixed structures only.
  - b. the maintenance of military structures.
  - c. the construction and maintenance of fixed structures or public works.
2. Civil engineering makes the world ...
  - a. more irritable.
  - b. a more agreeable place for being lonely.
  - c. more attractive for living.
3. Civil engineering is the broadest of the engineering fields, ...
  - a. partly because it is a very progressive field of engineering.
  - b. partly because it is a very ancient field of engineering.
  - c. partly because it is a very new field of engineering.

*VI. a) Complete the table:*

Noun	Verb	Adjective
–	–	constructive
agreement	–	–
–	–	developed
–	observe	–
–	–	maintaining
transportation	–	–

b) Choose the word from the table to complete the sentence:

1. Civil engineering makes the world a more ... place in which to live
2. Civil engineering is a broad field of engineering that deals with the ... of fixed structures, or public works.
3. Engineering has developed from ... of the ways natural and constructed systems react.
4. The ... of empirical equations provide bases for design.
5. One of the tasks of civil engineering is to ... public works.
6. Civil engineering deals with railways, water supply, sewer, ... and traffic.

VI. Scan the text and answer the questions:

1. What does civil engineering deal with?
2. What are fixed structures and public works related to?
3. Are bridges, roads, railways a part of structures that engineering deals with?
4. How may civil engineering be regarded?
5. What has engineering developed from?
6. What provides bases for design?
7. Is civil engineering the oldest or the newest of all engineering fields?
8. In how many fields was engineering once divided?
9. What is civil engineering comprised of?

### Grammar revision:

I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. Physics explains many of the changes that go on around us. (general)
2. A new glass works will be built here next year. (When)
3. The scientists obtained very important data. (What)
4. This woman is a teacher of physics. (Who)
5. They made many experiments in the cybernetics laboratory. (Where)

III. Open the brackets.

1. These data (to test) by our engineers at the laboratory tomorrow.
2. When a substance (to heat), the speed with which the molecules move is increased.
3. Electronics (to become) very important in all branches of production now.
4. I (to read) the material about friction at this time yesterday.
5. The lecturer told us that Archimedes (to discover) many laws of mathematics.

### Unit 3

I. Read the text:

#### Geotechnical engineering

The main subject of the field of geotechnical engineering is concerned with foundations, soil properties, soil mechanics, compression and swelling of soils, seepage, slopes, embankments, retaining walls, ground and rock anchors, use of synthetic tensile materials in soil structures, soil structure interaction, and soil dynamics.

#### Transportation engineering

Transportation engineering is concerned with moving people and goods efficiently, safely, and in a manner conducive to a vibrant community. This involves specifying, designing, constructing, and maintaining transportation infrastructure which includes streets, highways, rail systems, airports, ports, and mass transit. It includes areas such as transportation design, transportation planning, traffic engineering, urban engineering, queuing theory, pavement engineering, Intelligent Transportation System (ITS), and infrastructure management.

*II. Give Ukrainian equivalents to the following:*

foundation – \_\_\_\_\_  
to be concerned with – \_\_\_\_\_  
use – \_\_\_\_\_  
synthetic – \_\_\_\_\_  
interaction – \_\_\_\_\_  
moving – \_\_\_\_\_  
goods – \_\_\_\_\_  
efficiently – \_\_\_\_\_  
safely – \_\_\_\_\_  
in a manner – \_\_\_\_\_  
specifying – \_\_\_\_\_  
maintaining – \_\_\_\_\_  
highways – \_\_\_\_\_  
include – \_\_\_\_\_  
transportation engineering – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Geotechnical engineering is concerned with soil structure interaction, soil dynamics and maintenance of fixed structures.
2. Soil properties is one of the main subjects which is concerned with the field of geotechnical engineering.
3. Moving people and goods efficiently is one of the main tasks of transportation engineering.
4. Transportation infrastructure includes water supply and irrigation.
5. The main subject of the field of transportation engineering is concerned with transportation design, transportation planning, traffic engineering and urban engineering.

*IV. Continue the sentence:*

1. The main subject of geotechnical engineering is concerned with ...
  - a. foundations, soil properties and railway systems.
  - b. compression and swelling of soils, soil structure interaction and soil dynamics.
  - c. foundations, retaining walls and girders.
2. Transportation engineering is concerned with moving ...
  - a. goods efficiently.
  - b. people and goods in time.

- c. people and goods efficiently and safely.
3. Moving people and goods involves ...
  - a. constructing and maintaining transportation infrastructure.
  - b. planning, constructing and maintaining of fixed structures.
  - c. designing, constructing and maintaining transportation infrastructure.
4. Transportation infrastructure includes ...
  - a. roads, railways, power plants and traffic.
  - b. streets, railways, bridges, water supply and airports.
  - c. streets, rail systems, airports, ports and mass transit.

V. a) Complete the table:

Noun	Verb	Adjective
—	—	compressed
—	Move	—
specification	—	—
—	—	transported
management	—	—
—	Design	—
—	—	constructed

b) Choose the word from the table to complete the sentence:

1. Geotechnical engineering deals with soil properties, ... and swelling of soils and many other things.
2. The main task of transportation engineering is ... people and goods efficiently.
3. Streets, highways, rail systems and ports are a part of ... infrastructure.
4. To move people and goods efficiently one should ..., design, ... and maintain transportation infrastructure.
5. Transportation engineering includes transportation ..., transportation planning, traffic engineering, infrastructure ... and things like that.

VI. Scan the text and answer the questions:

1. Is geotechnical engineering concerned with maintaining transportation infrastructure?
2. What kinds of soil properties concern geotechnical engineering?
3. What is transportation engineering concerned with?
4. What does moving people and goods involve?
5. What does transportation infrastructure include?
6. Does transportation infrastructure deal with traffic, urban and pavement engineering?

### Grammar revision:

I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. These questions must be answered immediately. (When)
2. The workers used the new device to fulfill the plan ahead of time. (What)
3. The engineers will finish the experiment in a week. (general)
4. We noticed that she was writing something. (Who)

5. They were glad to have been informed about it. (Why)

*III. Open the brackets.*

1. This design (to be completed) next month.
2. Iron (to be) the most useful metal.
3. They already (to install) the equipment.
4. We (to replace) the parts of the machine yesterday.
5. When he came, I already (to make) a report for the conference

## Unit 4

*I. Read the text:*

### Environmental engineering

Wastewater treatment is a critical activity in environmental engineering, a sub-discipline of civil engineering.

Environmental engineering deals with the treatment of chemical, biological, and/or thermal waste, the purification of water and air, and the remediation of contaminated sites, due to prior waste disposal or accidental contamination. Among the topics covered by environmental engineering are pollutant transport, water purification, sewage treatment, and hazardous waste management. Environmental engineers can be involved with pollution reduction, green engineering, and industrial ecology. Environmental engineering also deals with the gathering of information on the environmental consequences of proposed actions and the assessment of effects of proposed actions for the purpose of assisting society and policy makers in the decision making process.

Environmental engineering is the contemporary term for sanitary engineering. Some other terms in use are public health engineering and environmental health engineering.

*II. Give Ukrainian equivalents to the following:*

subdiscipline – \_\_\_\_\_  
due to – \_\_\_\_\_  
disposal – \_\_\_\_\_  
to cover – \_\_\_\_\_  
to be involved – \_\_\_\_\_  
industrial ecology – \_\_\_\_\_  
to gather – \_\_\_\_\_  
consequence – \_\_\_\_\_  
decision – \_\_\_\_\_  
contemporary – \_\_\_\_\_  
other terms – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Environmental engineering is a subdiscipline of civil engineering.
2. Environmental engineering deals with wastewater treatment.
3. Sewage treatment and hazardous waste management are among topics covered by environmental engineering.
4. Environmental engineers can be involved with contamination.

5. Gathering of information on the environmental consequences of proposed actions is the only task of environmental engineering.
6. Sanitary engineering is the contemporary term for environmental engineering.

*IV. Continue the sentence:*

1. Environmental engineering is a subdiscipline of ...
  - a. geotechnical engineering.
  - b. sanitary engineering.
  - c. civil engineering.
2. Environmental engineering deals with ...
  - a. environmental contamination.
  - b. the treatment of wastes and the remediation of contaminated sites.
  - c. seepage, slopes and embankments.
3. Pollutant transport is a topic for ...
  - a. transportation engineering.
  - b. geotechnical engineering.
  - c. environmental engineering.
4. Environmental engineering can be involved with ...
  - a. construction and maintenance of transportation infrastructure.
  - b. pollution reduction and industrial ecology.
  - c. urban engineering, transportation planning and infrastructure management.
5. For the purpose of assisting society and policy makers in the decision making process environmental engineering deals with ...
  - a. the assessment of effects of contamination.
  - b. the Intelligent Transportation System.
  - c. the environmental consequences of proposed actions and the assessment of effects of these actions.

*V. a) Complete the table:*

Noun	Verb	Adjective
critic	—	—
—	—	purified
—	remediate	—
contamination	—	—
—	pollute	—
—	—	reduced
proposal	—	—
—	—	decisive
—	assess	—

*b) Choose the word from the table to complete the sentence:*

1. Environmental engineering concerns the purification of water and air and the ... of contaminated sites.
2. Environmental engineers deal with ... reduction.
3. Wastewater treatment is a ... activity in environmental engineering.

4. Environmental engineering covers also pollutant transport, water ..., sewage treatment and things like that.
5. Due to prior waste disposal or accidental contamination, ... sites should be remediated.
6. Environmental engineering involves gathering of information on the environmental consequences of ... actions.
7. Environmental engineering must also gather information on the environmental consequences of proposed actions and ... of effects of proposed actions.
8. For the purpose of assisting society and policy makers in the ... making process environmental engineering is to gather information on the environmental consequences of proposed actions.

*VI. Scan the text and answer the questions:*

1. What is the relation between environmental engineering and civil engineering?
2. Is wastewater treatment a very important activity in environmental engineering?
3. What does environmental engineering deal with?
4. How do many sites become contaminated?
5. What topics are covered by environmental engineering?
6. What can environmental engineers be involved with?
7. What kind of information does environmental engineering deal with?
8. What is the purpose of gathering of such kind of information?

**Grammar revision:**

*I. Explain the grammar phenomena underlined in the text.*

*II. Put questions to the following sentences.*

1. Any atom contains the same number of protons. (general)
2. They will repeat their experiment next month. (When)
3. Newton proved that white light consisted of rays of different colours. (What)
4. A rocket can travel in space where there is no air. (Where)
5. We have achieved good results in our work. (Who)

*III. Open the brackets.*

1. We (to work) in the laboratory now.
2. Newton (to die) in 1727 at the age of eighty-four.
3. We (to be surprised) that he had refused to take part in the conference.
4. I (to complete) my work by next Friday.
5. We knew that she (to pass) all her exams successfully.

**Unit 5**

*I. Read the text:*

**Construction engineering**

Construction engineering involves planning and execution of the designs from transportation, site development, hydraulic, environmental, structural and geotechnical engineers. As construction forms tend to have higher business risk than other types of civil engineering forms, many construction engineers tend to take on a

role that is more business-like in nature: drafting and reviewing contracts, evaluating logistical operations, and closely-monitoring prices of necessary supplies.

#### Materials science

Civil engineering also includes elements of materials science. Construction materials with broad applications in civil engineering include ceramics such as Portland cement concrete (PCC) and hot mix asphalt concrete, metals such as aluminum and steel, and polymers such as polymethylmethacrylate (PMMA) and carbon fibers. Current research in these areas focus around increased strength, durability, workability, and reduced cost.

#### Surveying

Elements of a building or structure must be correctly sized and positioned in relation to each other and to site boundaries and adjacent structures. Civil engineers are trained in the methods of surveying and may seek Professional Land Surveyor status.

### II. Give Russian equivalents of the following:

transportation – \_\_\_\_\_  
environmental engineers – \_\_\_\_\_  
to take on a role – \_\_\_\_\_  
necessary supplies – \_\_\_\_\_  
ceramics – \_\_\_\_\_  
portland cement concrete – \_\_\_\_\_  
polymethylacrylate – \_\_\_\_\_  
current research – \_\_\_\_\_  
increased strength – \_\_\_\_\_  
to be sized – \_\_\_\_\_  
site boundaries – \_\_\_\_\_  
methods of surveying – \_\_\_\_\_

### III. Translate the text and say whether these statements are true or false:

1. Construction forms tend to have higher business risk.
2. Very few construction engineers tend to take on a role that is more business-like in nature.
3. Construction engineering involves planning and execution of many designs.
4. Construction engineers have to do a lot of activities that are more business-like in nature.
5. Materials science is included in civil engineering.
6. Ceramics are construction materials with broad application.
7. Elements of a building must be correctly sized and positioned.
8. Civil engineers can be given Professional Land Surveyor status.

### IV. Continue the sentence:

1. Construction forms tend to have higher business risk than other types of ...
  - a. environmental engineering forms.
  - b. civil engineering forms.
  - c. sanitary engineering forms.
2. Construction engineers have to ...
  - a. closely monitor prices and goods on the world market.

- b. draft contracts on selling goods abroad.
  - c. draft and review contracts, evaluate logistical operations and monitor prices of necessary supplies.
3. Construction materials with broad applications in civil engineering include ...
    - a. ceramics, i.e. all types of concrete only.
    - b. ceramics, metals and polymers.
    - c. only hot mix asphalt concrete and carbon fibers.
  4. Construction engineering concerns ...
    - a. wastewater treatment.
    - b. the remediation of contaminated sites.
    - c. planning and execution of construction designs.

V. a) Complete the table:

Noun	Verb	Adjective
–	–	executed
transportation	–	–
–	Draft	–
–	–	applied
Focus	–	–
–	Reduce	–
–	–	trained
Size	–	–

b) Choose the word from the table to complete the sentence:

1. A lot of construction engineers have to ... and review contracts and do activities that are more business-like in nature.
2. Construction engineering involves ... of construction designs.
3. Construction engineers deal with the designs from ..., site development, environmental and many other engineers.
4. Ceramics are materials with broad ... in civil engineering.
5. Current research in construction materials ... around increased strength, durability, workability and things like that
6. ... cost of construction materials is the item that is paid much attention to.
7. Construction engineers must ... elements of a building correctly.
8. They ... civil engineers in the methods of surveying.

VI. Scan the text and answer the questions:

1. Execution of what designs does construction engineering deal with?
2. What kind of risk do construction forms tend to have?
3. What role do many construction engineers tend to take on?
4. What do construction engineers often have to do?
5. What science does civil engineering also include?
6. What construction materials with broad applications in civil engineering do you know?
7. What do current research of construction materials focus around?
8. How must elements of a building be sized and positioned?

9. How are civil engineers in the USA trained?

### Grammar revision:

I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. The speed of the rocket depends on the velocity of the escaping gases. (What)
2. We had to work hard to learn how to solve such equations. (Why)
3. There are many interesting articles about electronics at our library. (general)
4. Numbers can be multiplied in any order. (How)
5. We consulted a specialist before taking a decision. (Whom)

III. Open the brackets.

1. He (to work) at the mechanical shop now.
2. The energy that (to use) to put this engine in motion is not great.
3. A monumental work on mechanics (to complete) by Newton in 1687.
4. Tomorrow at this time they (to work) at the laboratory and (to make) interesting observations.
5. They (to finish) the experiment yesterday.

## Unit 6

I. Read the text:

### Careers

In the United States, there is no one typical career path for Civil Engineers. Most engineering graduates start with jobs of low responsibility, and as they prove their competence, are given more and more responsible tasks, but within each subfield of civil engineering, and even within different segments of the market within each branch, the details of a career path can vary. In some fields and in some forms, entry-level engineers are put to work primarily monitoring construction in the field, serving as the “eyes and ears” of more senior design engineers; while in other areas, entry-level engineers end up performing the more routine tasks of analysis or design. More senior engineers can move into doing more complex analysis or design work, or management of more complex design projects, or management of other engineers, or into specialized consulting, including forensic engineering.

Salaries for Civil Engineers in the United States have typically been lower than those for other fields of engineering, but entry-level salaries are higher than those in most non-engineering fields outside IT.

II. Give Ukrainian equivalents of the following:

low responsibility – \_\_\_\_\_

subfield of civil engineering – \_\_\_\_\_

can vary – \_\_\_\_\_

to monitor construction in the field – \_\_\_\_\_

to serve as the “eyes and ears” – \_\_\_\_\_

senior design engineers – \_\_\_\_\_

complex analysis or design work – \_\_\_\_\_

III. Translate the text and say whether these statements are true or false:

1. Civil Engineers in the United States have one typical career path.

2. Nowadays most engineering graduates don't have to prove their competence to be given more responsible tasks.
3. Within each subfield of civil engineering the details of a career path are the same.
4. In all fields and in all forms entry-level engineers start their work with monitoring construction in the field.
5. Civil engineers in the United States have salaries as those in other fields of engineering.

IV. *Continue the sentence:*

1. Most engineering graduates start with ...
  - a. more responsible tasks.
  - b. more routine tasks of analysis or design.
  - c. jobs of low responsibility.
2. Salaries of civil engineers in the United States are ...
  - a. higher than those in most non-engineering fields.
  - b. the same as in those of other fields of engineering.
  - c. lower than those of other fields of engineering.
3. In some forms entry-level engineers start their work with ...
  - a. monitoring construction in the field.
  - b. doing complex analysis and design work.
  - c. management of complex design projects.

V. a) *Complete the table:*

Noun	Verb	Adjective
—	manage	—
—	—	responsible
—	Vary	—
monitor	—	—
—	specialize	—
—	—	performed

b) *Choose the word from the table to complete the sentence:*

1. Nowadays most engineering graduates have to prove their competence to receive more ... tasks.
2. In the United States the career path for civil engineers in different subfields of civil engineering can ...
3. At the beginning of the career path entry-level engineers have to construction in the field.
4. More senior engineers ... more complex design projects.
5. In some fields entry-level engineers start their work monitoring construction in the field, while in other areas they ... the more routine tasks of design.
6. While entry level engineers start their work monitoring construction in the field, more senior engineers can move into management of other engineers or into ... consulting.

VI. Scan the text and answer the questions:

1. Is there only one typical career path for civil engineers in the United States?
2. How do most engineering graduates start their career path?
3. What do entry-level engineers have to do in some engineering forms?
4. What are more senior engineers meantime busy with?
5. How can salaries for Civil Engineers be compared with those for other fields of engineering?

**Grammar revision:**

I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. He will be busy with his research work. (general)
2. The scientists obtained new laboratory equipment. (What)
3. You must switch on the apparatus in time. (When)
4. We were taught how to handle these instruments. (Who)
5. The students have to study a lot of material. (Why)

III. Open the brackets.

1. The engine (not to function). It must (to repair).
2. We (to repeat) the experiment next month.
3. Our engineers (to put) the engine in motion yesterday.
4. They (to report) on the results of their observations by 10 o'clock tomorrow.
5. This area (to explore) by the scientists for several months last year

**Unit 7**

I. Read the text:

**Education and Licensure**

Prior to becoming a practicing engineer, civil engineers generally complete tertiary (college or higher) educational requirements, followed by several years of practical experience. Each country, state, or province individually regulates civil engineering practice.

In the U.S., one must become a licensed Professional Engineer to do any civil engineering work affecting the public or to legally represent oneself as a civil engineer. Licensure requirements vary slightly by state, but in all cases entail passing two licensure exams, the Fundamentals of Engineering exam and the Principles and Practice exam, and completing a state-mandated number of years of work under the supervision of a licensed Professional Engineer. In addition, an educational requirement must often be met. All states accept a four year Bachelor of Science (BS) or Bachelor of Engineering (BEng) degree in Civil Engineering. The acceptability of degrees in other fields varies by state; some states allow a person to substitute additional years of supervised work experience for the degree requirement. Although the American Society of Civil Engineers encourages states to raise the educational requirement to a graduate degree, advanced degrees are currently optional for civil engineers in the United States. Graduate study may lead either to a Master of Engineering, which is a Professional Master's degree, or to a Master of Science degree followed by a PhD in civil engineering or a sub-discipline.

II. Give Ukrainian equivalents of the following:

prior to becoming – \_\_\_\_\_

tertiary educational requirements – \_\_\_\_\_  
licensure requirements – \_\_\_\_\_  
a state-mandated number of years – \_\_\_\_\_  
under the supervision – \_\_\_\_\_  
varies by state – \_\_\_\_\_  
work experience – \_\_\_\_\_  
to be optional – \_\_\_\_\_  
currently – \_\_\_\_\_  
a requirement must be met – \_\_\_\_\_  
the acceptability of degrees – \_\_\_\_\_  
civil engineering practice – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Prior to becoming a practicing engineer, civil engineers have several years of practical experience.
2. A licensed Professional Engineer in the USA can do any civil engineering work affecting the public.
3. Licensure requirements vary greatly by state and entail passing two or three licensure exams.
4. In the US, to become a licensed Professional Engineer one should complete a state-mandated number of years of work under the supervision of a licensed Professional Engineer.
5. In Civil Engineering all states accept a Bachelor of Engineering degree only.
6. In the USA one cannot substitute additional years of supervised work experience for the degree requirement.
7. Nowadays advanced degrees are optional for civil engineers in the United States.

*.IV. Continue the sentence:*

1. To become a practicing engineer, civil engineers generally complete ...
  - a. secondary educational requirements.
  - b. higher educational requirements.
  - c. basic educational requirements.
2. To do any civil engineering work one must ...
  - a. become a licensed Professional Engineer.
  - b. get a Bachelor of Engineering degree.
  - c. complete a tertiary educational requirements.
3. Licensure requirements entail ...
  - a. passing the Fundamentals of Engineering exam and the Principles and Practice exam.
  - b. completing a state-mandated number of years of work.
  - c. passing the Fundamentals of Engineering exam and the Principles and Practice exam and completing a state-mandated number of years of work.
4. Some states allow a person to substitute ...
  - a. secondary educational requirements for the degree requirement.
  - b. the degree requirement for additional years of supervised work experience.
  - c. additional years of supervised work experience for the degree requirement.

V. a) Complete the table:

Noun	Verb	Adjective
—	—	practicing
—	regulate	—
—	—	licensed
education	—	—
—	—	supervised
—	—	required
addition	—	—

b) Choose the word from the table to complete the sentence:

1. Licensure ... entail passing two licensure exams.
2. A licensed Professional Engineer ... the work of a practicing engineer during several years of his practical experience.
3. To become a ... engineer, civil engineers generally complete higher educational requirements.
4. An ... requirement must often be met.
5. Some states allow a person to substitute ... years of supervised work experience for the degree requirement.
6. To do any civil engineering work in the US you must become a Professional Engineer.
7. Each country, state, or province individually ... civil engineering practice.
8. All states ... a four year Bachelor of Science or Bachelor of Engineering Degree.

VI. Scan the text and answer the questions:

1. What do civil engineers complete to become a practicing engineer?
2. Who regulates civil engineering practice?
3. Who can do any civil engineering work in the USA?
4. What do licensure requirements entail?
5. Who supervises the work of a practicing engineer during several years of his practical experience?
6. What degrees in Civil Engineering are accepted in the United States?
7. Is the situation with the acceptability of degrees in other fields the same in all states?
8. Are advanced degrees obligatory for civil engineers in the United States nowadays?
9. What degree follows after a Master of Engineering degree in the USA?

**Grammar revision:**

I. Explain the grammar phenomena underlined in the text

II. Put questions to the following sentences.

1. There are some radioactive elements in our laboratory. (general)
2. Our engineer wants to take part in this research work. (What)
3. She has got many books on your speciality. (How many)
4. A satellite in orbit remained in space. (Where)

5. Atoms of different kinds can join together in different ways. (How)

III. *Open the brackets.*

1. Scientists (to find) a way how to control the splitting of atoms.
2. Many complicated problems (to solve) with the help of computers now.
3. We (to be able) to examine this apparatus tomorrow.
4. The computational part of the experiment (to complete) before we began our work.
5. While I (to solve) these problems, I paid much attention to the correct computations

## Unit 8

I. *Read the text:*

### Construction engineering

Construction engineering concerns the planning and management of the construction of structures such as highways, bridges, airports, railroads, buildings, dams, and reservoirs. Construction of such projects requires knowledge of engineering and management principles and business procedures, economics, and human behavior. Construction engineers engage in the design of structures temporary, cost estimating, planning and scheduling, materials procurement, selection of equipment, and cost control.

Construction Engineering is differentiated from Construction Management from the standpoint of the use of math, science, and engineering to analyze problems and design a construction process. Construction engineers build many of the things that people use everyday. Construction engineering involves many aspects of construction including: commercial, residential, bridges, airports, tunnels, and dams. It is an extremely large industry that provides jobs to many and continues to grow. Currently there are nearly 6 million people working on construction in the United States

Construction engineers are in high demand so it is easy for a CE to get a job in any part of the country.

II. *Give Ukrainian equivalents of the following:*

- construction of dams and reservoirs – \_\_\_\_\_  
to require knowledge – \_\_\_\_\_  
management principles – \_\_\_\_\_  
human behavior – \_\_\_\_\_  
standpoint – \_\_\_\_\_  
use of math – \_\_\_\_\_  
to analyze problems – \_\_\_\_\_  
to involve many aspects – \_\_\_\_\_  
an extremely large industry – \_\_\_\_\_  
selection of equipment – \_\_\_\_\_

III. *Translate the text and say whether these statements are true or false:*

1. Construction of highways, bridges, airports, railroads, buildings, dams and reservoirs requires knowledge of parts of a building.

2. Construction engineering concerns the planning and management of the construction of structures.
3. The design of structures is only a part of the activities construction engineers engage in.
4. Construction Engineering is almost the same as Construction Management from the standpoint of the use of math.
5. Construction engineering involves only residential building.
6. There are a lot of unemployed people in construction industry in the USA.
7. They don't need any construction engineers in the USA.

*IV. Continue the sentence:*

1. The planning and management of the construction of structures is the main task of ...
  - a. construction process.
  - b. construction Engineering.
  - c. construction Management.
2. Construction engineers engage in ...
  - a. making laws.
  - b. selling and buying goods.
  - c. cost estimating, materials procurement, selection of equip-ment, etc.
3. Construction engineers build many of the things ...
  - a. that are out of use today.
  - b. that people don't need.
  - c. that people use everyday
4. Construction engineers ...
  - a. aren't in great demand in the USA.
  - b. are wanted all over the USA.
  - c. are out of demand in the USA.

*V. a) Complete the table:*

Noun	Verb	Adjective
—	—	constructed
requirement	—	—
—	design	—
growth	—	—
—	—	building
—	manage	—
—	—	selected

*b) Choose the word from the table to complete the sentence:*

1. Construction of bridges, airports, railroads, buildings and things like that ... knowledge of engineering and management principles.
2. Construction engineering concerns the planning and ... of the construction of structures.
3. Construction engineering involves many aspects of ...

4. Construction engineering is an extremely large industry and continues ...
5. Construction engineers ... a lot of things that people use everyday.
6. Construction engineers engage in the design of structures, planning and scheduling, ... of equipment, cost control and so on.
7. Construction engineers engage in the ... of structures.

*VI. Scan the text and answer the questions:*

1. Construction of what structures concerns the planning and management in construction engineering?
2. What knowledge does construction of highways, bridges, airports, buildings and things like that require?
3. What do construction engineers deal with?
4. Does Construction Engineering differ from Construction Management?
5. Why are construction engineers very popular among people?
6. What aspects of construction does construction engineering involve?
7. Is construction engineering a large industry?
8. Do many people work on construction in the USA?
9. Are there many unemployed among construction engineers in the USA?

**Grammar revision:**

*I. Explain the grammar phenomena underlined in the text.*

*II. Put questions to the following sentences.*

1. Construction engineers build many of the things that people use everyday. (What)
2. Six million people are working on construction in the USA. (How many)
3. They tested the device again yesterday. (When)
4. The students will prepare some reports for the conference. (What)
5. The word "electricity" was known in ancient Greece. (Where)

*III. Open the brackets.*

1. This month he (to read) many articles on the development of engineering.
2. There (to be) a large physics laboratory at our university.
3. The students (to know) the results of the examination by 3 o'clock tomorrow.
4. During the experiment the scientist observed that a small electric current (to flow).
5. This method (to work out) by a young scientist last year.

**Unit 9**

*I. Read the text:*

**Career**

Construction is the largest industry in the United States. It provides jobs to millions ranging in all types of education. Construction engineers follow the plans of architects and sometimes design the actual structure. After the structure has been designed the engineers make sure it has been built correctly by testing and overseeing the construction.

Tasks – Construction engineers have a lot of responsibilities in their job. Certain tasks have to be completed everyday in order to get the job done correctly.

Analyzing reports is a main part of their job description. They must analyze maps, drawings, blueprints, aerial photography and other topographical information. Construction engineers also have to use computer software to design hydraulic systems and structures while following construction codes. They have to calculate load and grade requirements, liquid flow rates and material stress points to ensure that the structure can withstand stress. Keeping a safe workplace is key to having a successful construction company. It is the construction engineer's job to make sure that everything is conducted correctly. In addition to safety, the construction engineer has to make sure that the site stays clean and sanitary. Surveying the land before construction begins is also a job of the construction engineer. They have to make sure that there are no impediments in the way of where the structure will be built and if there are any they must move them. They also must estimate costs and keep the project under budget. Construction engineers have to test the soils and materials used for adequate strength. Finally, construction engineers have to provide construction information, including repairs and cost changes, to the managers.

*II. Give Ukrainian equivalents of the following:*

- to follow the plans – \_\_\_\_\_
- to oversee the construction – \_\_\_\_\_
- a main part – \_\_\_\_\_
- to analyze blueprints – \_\_\_\_\_
- topographical information – \_\_\_\_\_
- computer software – \_\_\_\_\_
- to withstand stress – \_\_\_\_\_
- a safe workplace – \_\_\_\_\_
- to conduct correctly – \_\_\_\_\_
- clean and sanitary – \_\_\_\_\_
- an impediment – \_\_\_\_\_
- in the way – \_\_\_\_\_
- cost changes – \_\_\_\_\_
- to test the soils – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Construction engineering provides jobs to millions having higher education only.
2. After the structure has been designed the engineers make sure it has been built correctly by testing the soils.
3. The main task of construction engineers concerns analyzing.
4. Construction engineers never use computer software in their work.
5. It is the construction engineer's job to make the site clean and sanitary.
6. Construction engineers have to survey the land before construction begins.
7. The soils and materials used have to be tested for adequate strength by the managers.
8. The managers are to be provided with construction information, including repairs and cost changes.

*IV. Continue the sentence:*

1. Construction industry provides jobs to ...
  - a. millions having higher education only.
  - b. millions of people having no education at all.
  - c. millions having different types of education.
2. Construction engineers follow the plans of architects and ...
  - a. sometimes make the site clean and sanitary.
  - b. oversee the construction.
  - c. decide what the size of the walls must be.
3. The main part of construction engineers' job description is ...
  - a. making aerial photography.
  - b. analyzing reports.
  - c. using computer software.
4. To have a successful construction company means ...
  - a. to follow construction codes.
  - b. to calculate load and grade requirements correctly.
  - c. to keep a safe workplace.
5. Construction engineers also must estimate costs ...
  - a. to keep a safe workplace.
  - b. to keep the site clean and sanitary.
  - c. to keep the project under budget.

V. a) complete the table:

Noun	Verb	Adjective
—	—	built
—	response	—
description	—	—
—	calculate	—
—	—	required
—	move	—
provision	—	—
—	Ensure	—

b) Choose the word from the table to complete the sentence:

1. Construction engineers have to make sure that there are no impediments in the way of where the structure will be ... .
2. Construction engineers have to ... construction information to the managers.
3. They have to calculate load and grade ... .
4. Construction engineers have a lot of ... in their job.
5. Certain ... have to be completed to ensure that everything is conducted correctly.
6. They have to make all the calculations to ... that the structure can withstand stress.
7. If there are any impediments in the way of where the structure will be built they must ... them.
8. Analyzing reports is a main part of their job ... .

VI. Scan the text and answer the questions:

1. Whom does construction industry provide jobs to?
2. Construction engineers follow the plans of architects, don't they?
3. How do construction engineers make sure the structure has been built correctly?
4. What is a main part of construction engineers' job description?
5. What do construction engineers have to use computer software for?
6. When do construction engineers have to conduct surveying the land?
7. What must construction engineers do with impediments that happen to be in the way of where the structure will be built?
8. Why do construction engineers have to test the soils and materials used?
9. What do construction engineers have to provide to the managers?

**Grammar revision:**

I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. Most substances expand or get bigger when they are heated. (When)
2. Zinc is cheaper than other metals. (What)
3. We have to take part in the industrial exhibition. (Where)
4. The equation can be simplified by different ways. (How)
5. The professor spoke about the new method. (What)

III. Open the brackets.

1. If a gas at any pressure (to permit) to expand, its temperature falls.
2. Certain new elements (to produce) artificially.
3. He (to solve) all these equations before the bell rang.
4. We (to finish) obtaining the data by the end of last week.
5. He said that the article on achievements in the field of mathematics (to appear) in the magazine next week.

**Unit 10**

I. Read the text:

**Construction engineers**

Construction engineers build structures that are used by people everyday so they have to be safe and be able to withstand the elements. To complete the job properly construction engineers have to have the knowledge of many different aspects. Those aspects include engineering, technology, design, math, construction, English, customer service, management, transportation, public safety, and computers. They use the engineering, technology, and math aspects to make sure they build the structure to the set standards. They use English, customer service, and management knowledge to deal with the people that could possibly buy the structure. They also use this knowledge to inform the management on how the project is coming along and if any changes are needed.

Most construction engineers have a love for math and science. In addition to these abilities there are many other skills needed to be a construction engineer. Critical thinking, listening, learning, problem solving, monitoring, and decision making are all very important in construction engineering. Construction engineers

have to be able to think about all aspects of a problem and listen to other's ideas so that they can learn everything about a project before it begins. After they have begun a project they must solve the problems that they encounter using math and science. They also have to monitor the workers on the job site for safety and to make sure that the project is on time and done correctly. Whenever a problem occurs it is up to the construction engineer to make the decision on how to fix it.

*II. Give Ukrainian equivalents of the following:*

to be safe – \_\_\_\_\_  
to complete the job – \_\_\_\_\_  
different aspects – \_\_\_\_\_  
to inform management – \_\_\_\_\_  
to buy the structure – \_\_\_\_\_  
a love for math and science – \_\_\_\_\_  
many other skills – \_\_\_\_\_  
all aspects of a problem – \_\_\_\_\_  
to learn everything about the problem – \_\_\_\_\_  
whenever a problem occurs – \_\_\_\_\_  
how to fix it – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Structures that are used by people everyday have to be safe.
2. To complete the job properly construction engineers have to have the knowledge of engineering and management only.
3. They use customer service and management knowledge to make sure they build the structure to the set standards.
4. To be a construction engineer you must have a love for literature.
5. Construction engineers don't have to know anything about a project before it begins.
6. They have to use math and science after a project have been started.
7. The workers have to monitor the construction process on the job site.
8. The construction engineers have to make the decision on how to fix any problem.

*IV. Continue the sentence:*

1. Construction engineers use math aspects ...
  - a. to withstand the elements.
  - b. to complete the job properly.
  - c. to build the structure to the set standards.
2. Critical thinking, listening, learning, problem solving are needed ...
  - a. to use a computer properly.
  - b. to be a construction engineer.
  - c. to monitor the workers on the job site.
3. Construction engineers can learn everything about a project before it begins ...
  - a. using English and management knowledge.
  - b. thinking about all aspects of a problem and listening to other's ideas.

- c. solving the problems that they encounter.
4. Construction engineers have to have the knowledge of many different aspects ..
  - a. to inform the management on how the project is coming along.
  - b. to deal with the people that could possibly buy the structure.
  - c. to complete the job properly.

V. a) Complete the table:

Noun	Verb	Adjective
–	Save	–
–	–	informed
make	–	–
–	–	used
–	manage	–
building	–	–
–	–	monitored

b) Choose the word from the table to complete the sentence:

1. Construction engineers use math aspects to make sure they ... the structure to the set standards.
2. Structures that are used by people everyday have to be ... and be able to withstand the elements.
3. They use management knowledge ... the management on how the project is coming along.
4. Construction engineers have to have the knowledge of engineering, technology, design, ..., public safety and things like that to complete the job properly.
5. Construction engineers have to ... sure that the project is on time and done correctly.
6. They also have to ... the workers on the job site for safety.
7. To complete the job properly construction engineers ... the knowledge of many different aspects.

VI. Scan the text and answer the questions:

1. Why do structures that construction engineers build have to be safe?
2. What do construction engineers have to have the knowledge of many different aspects for?
3. What knowledge do construction engineers have to have to make sure they build the structure to the set standards?
4. What knowledge do they use to deal with the people that could possibly buy the structure?
5. Who informs the management on how the project is coming along?
6. How do construction engineers can learn everything about a project before it begins?
7. What must construction engineers solve after they have begun a project?
8. Why do construction engineers have to monitor the workers on the job site?

9. Does the management or a construction engineer make the decision on how to fix any problem whenever it occurs?

### Grammar revision:

I. *Explain the grammar phenomena underlined in the text.*

II. *Put questions to the following sentences.*

1. Heat travels easily through some materials. (general)
2. When he went to the scientific conference, he met many scientists and engineers. (Whom)
3. We can add these fractions. (Why)
4. The first man to invent the radio was A.Popov. (Who)
5. We shall make the experiment under the direction of a skilled instructor. (How)

III. *Open the brackets.*

1. They (to practice) differential equations before they proceeded to the new material.
2. We (to study) ratio problems this week.
3. When the experiment (to finish), the engineers left the laboratory.
4. In the future scientists (to solve) new important problems in mathematics.
5. In the 19<sup>th</sup> century scientists (to be able) to establish experimentally the atomic theory of the structure of mater.

### Unit 11

I. *Read the text:*

#### *Construction engineers*

Construction engineers have many different kinds of abilities they use to do their job. Construction engineers use these abilities to communicate with other workers and to solve problems. They also have to use their abilities to know what kinds of materials to order and how to get those materials while staying under the budget.

Construction engineers have many activities that they have to do everyday. Those activities include drafting, decision making, computer interaction, communication, documenting, creative thinking, organizing, information collecting, estimating, and analyzing. Construction engineers use drafting to design structures and to show others how to build them. They have to analyze information and make the best decision and solve problems. Computers are an important tool used by construction engineers. They use them to write programs and solve equations. Communication is used everyday to interact with coworkers and supervisors. They have to communicate in person, by telephone, and through e-mail. Documentation is used to record important information that needs to be passed on to management. Most documenting is done in electronic form. Creative thinking is used to come up with new ideas and solve problems. Construction engineers have to be organized to accomplish goals and prioritize jobs. They have to gather information on the task at hand before they can start a project. This will help ensure that the job is completed correctly. In order to keep a project under budget, construction engineers have to estimate costs of materials and workers. Finally, they have to analyze data to find answers to problems they are having on the job site.

III. Give Ukrainian equivalents to the following:

- to stay under the budget – \_\_\_\_\_  
computer interaction – \_\_\_\_\_  
creative thinking – \_\_\_\_\_  
information collecting – \_\_\_\_\_  
to design structures – \_\_\_\_\_  
to interact with coworkers – \_\_\_\_\_  
to communicate in person – \_\_\_\_\_  
to be passed on to management – \_\_\_\_\_  
to gather information on task – \_\_\_\_\_  
to estimate costs of materials – \_\_\_\_\_

IV. Translate the text and say whether these statements are true or false:

1. Construction engineers use different kinds of abilities to communicate with each other.
2. Construction engineers have a lot to do every day.
3. The activities of the construction engineers include creative thinking and organizing parties.
4. Construction engineers don't use computers in their work.
5. Construction engineers have to communicate with coworkers by telephone only.
6. Creative thinking is used to solve problems.
7. Construction engineers have to analyze data to ask the workers questions.

V. Continue the sentence:

1. Construction engineers have many abilities ...
  - a. to do every day.
  - b. they use to do their job.
  - c. to design structures.
2. Construction engineers use documentation ...
  - a. to solve problems.
  - b. to analyze information.
  - c. to record information and to pass it onto management.
3. Construction engineers use estimating ...
  - a. to make the best decision and solve problems.
  - b. to keep a project under budget.
  - c. to show others how to build structures.

VI. a) Complete the table:

Noun	Verb	Adjective
construction	—	—
—	communicate	—
—	—	decisive
interaction	—	—
—	Create	—
organization	—	—

VII. Scan the text and answer the questions:

1. What kind of activities do construction engineers have to do every day?
2. What do construction engineers use their abilities for?
3. What do construction engineers use drafting for?
4. How do they manage to make the best decision and solve problems?
5. What do construction engineers use for writing programs and solving equations?
6. What is communication used for?
7. How do construction engineers pass important information onto management?
8. What is creative thinking used for?
9. Why do construction engineers have to be organized?
10. What do construction engineers have to do in order to keep a project under budget?
11. How do construction engineers find answers to problems they are having on the job site?

**Grammar revision:**

I. Explain the grammar phenomena underlined in the text

II. Put questions to the following sentences.

1. Any material changes when it is heated. (When)
2. Heat can also travel without the use of any material conductor. (How)
3. In ancient times people thought that heat was a material. (What)
4. The students have to study the laws of motion. (Why)
5. Gravity had been known long before Newton's time. (general)

III. Open the brackets.

1. He (to read) all these mathematical magazines by next Saturday.
2. There (to be) many ways of producing heat.
3. Certain new elements (to produce) artificially.
4. The Romans (to work) out a way of heating all the rooms in their houses with one fire.
5. We (to inform) him of the results of our work before he rang us up.

**Unit 12**

I. Read the text:

**Building construction**

Building construction is the process of adding structure to real property. The vast majority of building construction projects are small renovations, such as addition of a room, or renovation of a bathroom. Often, the owner of the property acts as laborer, paymaster, and design team for the entire project. However, all building construction projects include some elements in common – design, financial, and legal considerations. Many projects of varying sizes reach undesirable end results, such as structural collapse, cost overruns; those with experience in the field make detailed plans and maintain careful oversight during the project to ensure a positive outcome.

For projects of large size and/or unusual type, the owner will likely establish a team of workers and advisors to create an overall plan. This ensures that the project

will proceed in an orderly way to a desirable end. While no set list would establish what is needed or advisable for a particular project, frequently used advisors include mortgage bankers, accountants, lawyers, insurance brokers, architects, and engineers. While their roles overlap, each area of expertise addresses an element of what will be affected by the building construction project.

*III. Give Ukrainian equivalents to the following:*

- a vast majority – \_\_\_\_\_
- the owner of the property – \_\_\_\_\_
- design team – \_\_\_\_\_
- a varying size – \_\_\_\_\_
- an undesirable end result – \_\_\_\_\_
- detailed plans – \_\_\_\_\_
- to maintain – \_\_\_\_\_
- to ensure a positive outcome – \_\_\_\_\_
- to establish a team of workers – \_\_\_\_\_
- a particular project – \_\_\_\_\_
- an accountant – \_\_\_\_\_
- frequently – \_\_\_\_\_

*IV. Translate the text and say whether these statements are true or false:*

1. Building construction concerns adding structure to real property.
2. A small renovation often includes addition of a room, renovation of a bathroom and things like that.
3. The construction engineer usually acts as laborer, paymaster, and design team for the entire project.
4. Many projects of varying sizes reach desirable end results.
5. Those with experience in the field make it possible to ensure a positive outcome.
6. For projects of large size the owner creates an overall plan himself.
7. A group of advisors establish a set list of what is needed for a particular project.

*V. Continue the sentence:*

1. The owner of the property often acts as ...
  - a. a construction engineer.
  - b. a manager.
  - c. a laborer.
2. This ensures that the project will proceed in an orderly way to ...
  - a. an undesirable end result.
  - b. a desirable end.
  - c. a negative outcome.
3. All building construction projects include ...
  - a. small renovations.
  - b. financial and legal considerations.
  - c. cost overruns.

4. A team of workers and advisors is established to deal with ...
  - a. addition of a room.
  - b. projects of large size and unusual type.
  - c. renovation of a bathroom.
5. Mortgage bankers, accountants, lawyers, insurance brokers, architects and engineers make up ...
  - a. a team of workers for a particular project.
  - b. a team of design workers for a particular projects.
  - c. a team of frequently used advisors for a particular projects.

VI. Complete the table:

Noun	Verb	Adjective
—	Major	—
—	—	renovated
—	finance	—
desire	—	—
—	detail	—
—	—	addressed
advice	—	—

b) Choose the word from the table to complete the sentence:

1. All building construction projects include design, ... and legal considerations. 2. The vast ... of building construction projects are small renovations. 3. A team of workers and advisors create an overall plan to ensure that the project will proceed in an orderly way to a ... end. 4. Those with experience in the field make ... plans and maintain careful oversight during the project. 5. A set list of what is needed or ... for a particular project should be established. 6. Each area of expertise ... an element of what will be affected by the building construction project. 7. A building construction project sometimes includes addition of a room or ... of a bathroom.

VII. Scan the text and answer the questions:

1. What does building construction deal with?
2. What does a small renovation usually include?
3. How does the owner of the property usually act?
4. What do all building construction projects include?
5. What do many projects of varying sizes sometimes reach?
6. Why should careful oversight be maintained during the project?
7. What will the owner likely establish a team of workers and advisors for?
8. What ensures that the project will proceed in an orderly way to a desirable end?
9. Whom do frequently used advisors include?
10. Do their roles overlap?
11. What does each area of expertise address?

**Grammar revision:**

- I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. We met the chief of the expedition yesterday. (When)
2. To fulfill this task was not easy. (general)
3. This discovery will produce great changes in the field of electronics. (Where)
4. The gun recoils in the opposite direction. (How)
5. The results of the research must be presented next Monday. (When)

III. Open the brackets.

1. All these problems (to solve) with the help of computing machines before we obtained the final results.
2. Newton (to develop) a mathematical method indispensable in all questions concerning motion.
3. You (to learn) how to solve such problems if you study hard.
4. A rocket (to be able) to travel in space where there is no air.
5. Astrophysicists (to study) the structure of galaxies for a long time.

## Unit 13

I. Read the text:

### Residential construction

More and more families are looking into building their own homes, or contracting to have them built. Construction practices, technologies, and resources conform to state and local building codes. In most Australian states, a home owners warranty must be obtained prior to residential construction of dwellings less than three stories high.

Heavy/Highway construction

Heavy/Highway construction is the process of adding infrastructure to our built environment. Owners of these projects are usually government agencies, either at the national or local level. As in building construction, heavy/highway construction has design, financial, and legal considerations, however these projects are not usually undertaken for-profit, but to service the public interest. However, heavy/highway construction projects are also undertaken by large private corporations, including, among others, the golf courses, harbors, power companies, railroads, and mines, who undertake the construction of access roads, dams, railroads, general site grading, and massive earthwork projects. As in building construction, the owner will assemble a team to create an overall plan to ensure that the goals of the project are met.

II. Give Ukrainian equivalents to the following:

- to conform – \_\_\_\_\_
- home owners warranty – \_\_\_\_\_
- to obtain – \_\_\_\_\_
- to add infrastructure – \_\_\_\_\_
- a harbor – \_\_\_\_\_
- a government agency – \_\_\_\_\_
- a local level – \_\_\_\_\_
- profit – \_\_\_\_\_ a
- public interest – \_\_\_\_\_
- a mine – \_\_\_\_\_
- to undertake the construction – \_\_\_\_\_
- to create an overall plan – \_\_\_\_\_

III. Translate the text and say whether these statements are true or false:

1. More and more families want to build their own homes.
2. A home owners warranty must be obtained to construct a dwelling less than three stories high.
3. Heavy construction is the process of adding a structure to real property.
4. Only private agencies usually own the projects concerning the process of adding infrastructure to our built environment.
5. Heavy/highway construction projects are undertaken for profit.
6. Heavy construction projects concerning golf courses, harbors, power companies, rail roads are undertaken by government agencies.
7. An overall plan is created to ensure that the goals of the projects are met.

IV. Continue the sentence:

1. A home owners warranty must be obtained ...
  - a. before residential construction of dwellings.
  - b. due to residential construction of dwellings.
  - c. after residential construction of dwellings starts.
  
2. A lot of families nowadays are looking into ...
  - a. building their own flats.
  - b. contracting to have their own golf courses.
  - c. contracting to have their own homes built.
3. Heavy construction is the process of adding ...
  - a. structures to real property.
  - b. a room or renovation of a bathroom.
  - c. golf courses, harbors, power companies and things like that to our built environment.
4. Heavy/highway construction projects are undertaken ...
  - a. for profit.
  - b. to service the public interest.
  - c. to service the government interest.
5. The owners ... to ensure that the goals of the project are met.
  - a. himself creates an overall plan
  - b. assembles a team to create an overall plan
  - c. undertakes all measures

VI. a) Complete the table:

Noun	Verb	Adjective
—	Build	—
—	—	contractual
—	Reside	—
• nance	—	—
—	—	interesting
—	Environ	—
creation	—	—

		assembled
--	--	-----------

b) Choose the word from the table to complete the sentence:

1. Heavy/highway construction deals with adding infrastructure to our built ... .
2. Heavy/highway construction has design, ..., and legal considerations.
3. Many families nowadays are ... building their own homes.
4. A home owners warranty must be obtained prior to ... construction of dwellings.
5. Heavy/highway construction projects are undertaken to service the public ...
6. A team of advisors ... an overall plan to ensure that the goals of the project are met.
7. Construction practices, technologies, and resources conform to state and local ... codes.
8. The owner of the project will ... a team to create an overall plan.

VII. Scan the text and answer the questions:

1. What are more and more families looking into?
2. When must a home owners warranty be obtained?
3. What does heavy/highway construction deal with?
4. Who is the owner of heavy/highway construction projects?
5. Are heavy/highway construction projects undertaken for profit?
6. What do heavy/highway construction projects include?
7. What does the owner of the project assemble a team of advisors for?
8. What do a team of advisors create an overall plan for?

### Grammar revision:

I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. Newton spent a lot of time constructing models. (Why)
2. As long as the expanding gases provide thrust, the rocket will move forward. (How long)
3. To launch the satellite, we had to make use of the step principle.(What)
4. Every object on Earth exerts a force of attraction on every other object. (What force)
5. Careful experiments have shown good results. (What)

III. Open the brackets.

1. The early works by Tsiolkovsky (to follow) by a number of very important works in the field of astronautics.
2. He (to work) at the mechanical shop now.
3. Force (to act) on matter to produce motion in a given direction.
4. The scientists (to continue) their research work next year.
5. If she (to work) hard, she (to pass) her exams successfully.

## Unit 15

I. Read the text:

### Industrial construction

Industrial construction, though a relatively small part of the entire construction industry, is a very important component. Owners of these projects are usually large, for-profit, industrial corporations. These corporations can be found in such industries as medicine, petroleum, chemical, power generation, manufacturing, etc. Processes in these industries require highly specialized expertise in planning, design, and construction. As in building and heavy/ highway construction, this type of construction requires a team of individuals to ensure a successful project.

#### Design team

In the modern industrialized world, construction usually involves the translation of paper or computer based designs into reality. A formal design team may be assembled to plan the physical proceedings, and to integrate those proceedings with the other parts. The design usually consists of drawings and specifications, usually prepared by a design team including architects, interior designers, civil engineers, cost engineers (or quantity surveyors), mechanical engineers, electrical engineers, and structural engineers. The design team is most commonly employed by (i.e. in contract with) the property owner. Under this system, once the design is completed by the design team, a number of construction companies or construction management companies may then be asked to make a bid for the work, either based directly on the design, or on the basis of drawings and a bill of quantities provided by a surveyor. Following evaluation of bids, the owner will typically award a contract to the lowest responsible bidder.

#### III. Give Russian equivalents to the following:

- petroleum – \_\_\_\_\_
- to manufacture – \_\_\_\_\_
- to involve – \_\_\_\_\_
- paper based – \_\_\_\_\_
- to assemble – \_\_\_\_\_
- a physical proceeding – \_\_\_\_\_
- to integrate – \_\_\_\_\_
- commonly – \_\_\_\_\_
- to employ – \_\_\_\_\_
- a construction company – \_\_\_\_\_
- to base – \_\_\_\_\_
- a quantity surveyor – \_\_\_\_\_
- to provide – \_\_\_\_\_
- typically \_\_\_\_\_
- a bidder – \_\_\_\_\_

#### IV. Translate the text and say whether these statements are true or false:

1. Industrial construction is a large part of the entire construction industry.
2. Large, for-profit, industrial corporations own industrial construction projects.
3. Processes in medicine, petroleum, chemical, manufacturing and other industries require common expertise in planning and construction.
4. Industrial construction requires a team of civil engineers to ensure a successful project.
5. Construction usually involves the translation of computer based designs into paper.

6. The physical proceedings are planned by a formal team of individuals.
7. A design team usually prepares a successful project.
8. A design team usually consists of individuals and owners.
9. The design team is usually in contact with the property owner.
10. After the design is completed construction companies can make a bid for the work.
11. The owner usually awards a contract to the most famous bidder.

V. *Continue the sentence:*

1. Owners of industrial construction projects are usually ...
2. Industrial construction requires a team of individuals ...
3. A formal design team may be assembled ...
4. After the design is completed a number of construction companies or construction management companies may be asked ...
5. After evaluation of bids the owner usually awards a contract ...

VI. a) *Complete the table:*

Noun	Verb	Adjective
-	succeed	-
form	-	-
-	-	proceeded
-	Prepare	-
provision	-	-
-	-	based
-	respond	-

b) *Choose the word from the table to complete the sentence:*

1. A ... design team usually prepares drawings and specifications.
2. The design usually consists of drawings and specifications, usually ... by a design team.
3. Industrial construction requires a team of individuals to ensure project.
4. A formal design team may be assembled to plan the physical ... .
5. Construction usually involves the translation of paper or computer ... designs into reality.
6. A surveyor is a person who usually ... a bill of quantities.
7. The owner usually awards a contract to the lowest ... bidder.

VII. *Scan the text and answer the questions:*

1. Industrial construction is a relatively small part of the entire construction, isn't it?
2. Who are the owners of industrial construction projects?
3. Where can these corporations be found?
4. What kind of expertise do processes in these industries require?

5. What does industrial construction require a team of individuals for?
6. What does construction usually involve in the modern industrialized world?
7. What may a formal design team be assembled for?
8. Who usually prepares drawings and specifications?
9. Whom does a design team include?
10. Who commonly employs the design team?
11. When may a number of construction companies or construction management companies be asked to make a bid for a work?
12. Who provides a bill of quantities?
13. Whom does the owner typically award a contract to?

### **Grammar revision:**

*I. Explain the grammar phenomena underlined in the text.*

*II. Put questions to the following sentences.*

1. Trigonometry includes all kinds of investigations of trigonometric functions of angles and numbers. (What)
2. She has learned to solve such problems. (How)
3. They came to the laboratory to obtain the data they needed. (Why)
4. There will be some changes in our project. (How many)
5. This question may be of great scientific importance. (general)

*III. Open the brackets.*

1. The new device for creating pressure (to speak) much about by the students of our group. 2. When the experiment (to finish), the engineers left the laboratory. 3. If you (to throw) something up into the air, it (to fall) to the ground. 4. During the experiment the scientist observed that a small electrical current (to follow). 5. We often (to use) diagrams at our lesson.

### **Unit 17**

*I. Read the text:*

#### **Concrete**

The most common form of concrete consists of Portland cement, construction aggregate (generally gravel and sand) and water.

Concrete does not solidify from drying after mixing and placement; the water reacts with the cement in a chemical process known as hydration. This water is absorbed by cement, which hardens, gluing the other components together and eventually creating a stone-like material. When used in the generic sense, this is the material referred to by the term concrete.

Concrete is used more than any other man-made material on the planet. It is used to make pavements, building structures, foundations, motorways/roads, overpasses, parking structures, brick/block walls and bases for gates, fences and poles.

As of 2005, about six billion cubic meters of concrete are made each year, amounting to the equivalent of one cubic meter for every person on Earth. Concrete powers a US\$35 billion industry which employs over two million workers in the

United States alone. Over 55,000 miles of freeways and highways in America are made of this material. China currently consumes 40 % of world cement production.

II. Give Ukrainian equivalents to the following:

- common form – \_\_\_\_\_  
 Portland cement – \_\_\_\_\_  
 solidify – \_\_\_\_\_  
 chemical process – \_\_\_\_\_  
 hydration – \_\_\_\_\_  
 harden – \_\_\_\_\_  
 pavement – \_\_\_\_\_  
 overpass – \_\_\_\_\_  
 pole – \_\_\_\_\_  
 amount to – \_\_\_\_\_  
 employ – \_\_\_\_\_  
 freeways and highways – \_\_\_\_\_

III. Translate the text and say whether these statements are true or false:

1. Concrete consists of Portland cement, gravel and sand.
2. Concrete hardens after mixing and placement.
3. Concrete isn't used more than any other natural material on the planet.
4. We use concrete to make cars and heavy trucks.
5. Concrete wasn't used till the year 2005.
6. Since 2005 the production of concrete has increased greatly.
7. Very few workers in the United States deal with concrete production.
8. They do not use concrete in making highways in the United States.
9. China consumes only a small part of world cement production

IV. Continue the sentence:

1. The most common form of concrete consists of ...
2. Concrete hardens ...
3. Concrete is used more than any other ...
4. A great deal of concrete is made each year, amounting ...

VI. a) Complete the table:

Noun	Verb	Adjective
–	Place	–
reaction	–	–
–	–	absorbed
–	Park	–
consumer	–	–
–	–	employed
hardener	–	–

b) Choose the word from the table to complete the sentence:

1. In the process of concrete production the water is ... by cement, which hardens, creating a stone-like material.
2. Concrete is used to make foundations, brick walls, building and structures, pavements and things like that.
3. Concrete production industry ... over two million workers in the United States alone.
4. Concrete does not solidify from drying after mixing and ... .
5. China currently ... 40 % of world cement production.
6. The water ... with the cement in chemical process known as hydration.
7. After the water is absorbed by cement, the aggregate usually ... .

*VII. Scan the text and answer the questions:*

1. What does the most common form of concrete consist of?
2. When does concrete harden?
3. How is this process called?
4. What is concrete used for?
5. Is concrete a popular material?
6. How much concrete is made each year?
7. How many people does concrete production employ in the United States?
8. How many miles of highways are made of concrete in America?
9. Who is the largest consumer of world cement production?

**Grammar revision:**

*I. Explain the grammar phenomena underlined in the text.*

*II. Put questions to the following sentences.*

1. Chemical materials and products will always be of great importance for all branches of the national economy in our country. (What)
2. The explorers saw no modern houses and no trace of civilization for many days. (How long)
3. Two powerful ventilators have been purifying the air in the room for half an hour. (Where)
4. The scientists of the Pulkovo observatory have made a valuable contribution to the study of the space. (Who)
5. The engineers of research laboratory developed some new methods of work. (general)

*III. Open the brackets.*

1. Next year the restoration of this old house (to pay) special attention to.
2. The building of analog computers (to begin) at the start of the 20th century.
3. We (to use) to having electricity and gas in our houses but a hundred years ago people (not to have) either.
4. Lundberg (to believe) that by the year 2021, there (to be) no longer oil for gasoline makers to use.
5. They (to maintain) constant temperature in the chamber since the beginning of the experiment.

**Unit 18**

*I. Read the text:*

**Woodworking**

Woodworking is the forming and shaping of wood to make useful and decorative objects. It is one of the oldest crafts and ranks as a popular hobby and an important industry. A skilled woodworker with a well-equipped home workshop can build items as simple as a birdhouse or as complicated as decorative furniture. Tools for a workshop can be purchased at hardware and department stores. Lumber retail stores and hobby shops sell a wide variety of wood.

The construction industry employs carpenters who construct the wooden framework of buildings. Other kinds of woodworkers include finish carpenters and cabinetmakers. Finish carpenters do the inside trim work around windows, cabinets, and other features that must fit exactly. Cabinetmakers design, shape, and assemble furniture, built-in cabinets, and stairways.

The history of woodworking goes back to about 8,000 B.C., when people first used an ax as a woodworking tool. In the Middle Ages, woodworkers and other craft workers formed organizations called guilds. The guilds were similar in some ways to today's labor unions

*II. Give Ukrainian equivalents to the following:*

- skilled woodworker – \_\_\_\_\_
- decorative furniture – \_\_\_\_\_
- department store – \_\_\_\_\_
- wide variety of wood – \_\_\_\_\_
- must fit exactly – \_\_\_\_\_
- assemble furniture \_\_\_\_\_
- stairway – \_\_\_\_\_
- woodworking tool \_\_\_\_\_
- called guilds – \_\_\_\_\_
- be similar in some ways – \_\_\_\_\_
- other kinds – \_\_\_\_\_
- shaping of wood – \_\_\_\_\_
- ranks as a popular hobby \_\_\_\_\_
- framework of a building – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Woodworking is a comparatively new industry.
2. Any woodworker can build simple and complicated items as well.
3. Wood for a workshop can be purchased at a department store.
4. You can find a wide variety of wood at lumber retail stores.
5. Carpenters are often employed in the construction industry.
6. Cabinetmakers do not deal with woodworking.
7. Finish carpenters usually do the work on the roof of the building.
8. An ax as a woodworking tool was first used long before Christ.
9. Today carpenters form organizations called guilds.

*IV. Continue the sentence:*

1. A skilled woodworker with a well-equipped home workshop can ...
2. Wood for woodworking can be purchased at ...
3. Carpenters are employed by the construction industry to ...

4. Built-in cabinets and stairways are designed ...
5. Finish carpenters deal with ...

V. a) Complete the table:

Noun	Verb	Adjective
—	decorate	—
—	—	ranked
equipment	—	—
—	purchase	—
—	—	varied
employment	—	—
—	include	—
—	—	trimmed
assembly	—	—
—	organize	—

b) Choose the word from the table to complete the sentence:

1. The wooden framework of buildings is constructed by carpenters who are ... by the construction industry.
2. There are other kinds of woodworkers which ... finish carpenters and cabinetmakers.
3. Nowadays woodworking ... as a popular hobby and an important industry.
4. Cabinet makers design, shape and ... furniture, built-in cabinets and stairways.
5. Woodworkers form and shape wood to make useful and ... objects.
6. The inside ... work is usually done by finish carpenters.
7. You can ... tools for a workshop at a hardware store.
8. In ancient times woodworkers formed ... called guilds.
9. A wide ... of wood is sold in lumber retail stores.
10. Having good ... at a home workshop a woodworker can build simple and complicated items as well.

VII. Scan the text and answer the questions:

1. What is woodworking?
2. When does the history of woodworking begin?
3. Where can a skilled woodworker build simple and complicated items?
4. Where can you buy tools for a workshop?
5. What do lumber retail stores sell?
6. Who constructs the wooden framework of buildings?
7. What other professions do woodworkers include?
8. What do cabinetmakers deal with?
9. Who does the inside trim work around wooden features that must fit exactly?
10. When did people use an ax as a woodworking tool?
11. When did woodworkers start forming guilds?
12. Were the guilds similar to any today's organizations?

**Grammar revision:**

I. Explain the grammar phenomena underlined in the text.

II. Put questions to the following sentences.

1. The students were listening to the professor with great attention. (Who)
2. The discovery of radio waves by A. Pavlov in 1895 had a great value for mankind. (general)
3. Students of railway transport Institutes study various aspects of railway science. (What)
4. Einstein explained the photoelectric effect by means of Planck's quantum theory. (How)
5. The study of light was Newton's favourite study. (What)

III. Open the brackets.

1. Electricity (to do) a lot of work for us. 2. Lomonosov's works (to lay) the foundations of physics, chemistry, astronomy, geology and geography in Ukraine. 3. The prominent scientist Academician Joffe (to make) a great contribution to the study of semiconductor physics. 4. Some power stations already (to use) atomic energy to generate electricity for peaceful aims. 5. We (to know) that gravity (to attract) all matter toward the centre of the Earth.

## Unit 20

I. Read the text:

### Sanding and Finishing

Sanding removes tool marks and makes wood surfaces smooth for finishing. Sanding should not begin until the wood has been cut to its final size. Most abrasive paper manufactured for use by hand has rough particles of the minerals fint or garnet. Aluminum oxide is a common sanding material used in such machines as a portable belt sander or a vibrating sander. Portable belt sanders work better than vibrating sanders on large wood surfaces.

Woodworkers use a variety of finishes to protect wood and to bring out the beauty of the grain. A stain is a dye that colors wood without hiding the pattern and feel of the grain. Paint covers the grain of the wood and provides a color of its own. Varnish, shellac, and lacquer add a hard, glossy finish while exposing the beauty of the wood. Wax protects varnish and has a smooth, shiny finish when polished. Enamel is a type of glossy paint.

II. Give Ukrainian equivalents to the following:

smooth for finishing – \_\_\_\_\_

final size – \_\_\_\_\_

manufactured for use by hand – \_\_\_\_\_

aluminum oxide – \_\_\_\_\_

beauty of the wood – \_\_\_\_\_

a stain – \_\_\_\_\_

a dye – \_\_\_\_\_

that colors wood – \_\_\_\_\_

provides a color of its own – \_\_\_\_\_

a varnish – \_\_\_\_\_

a shellac – \_\_\_\_\_  
 shiny finish – \_\_\_\_\_  
 an enamel – \_\_\_\_\_

*III. Translate the text and say whether these statements are true or false:*

1. Finishing makes wood surfaces smooth for sanding.
2. Before sanding the wood should be cut to its final size.
3. Most abrasive paper manufactured for use by hand is very soft.
4. Vibrating sanders are the best machines used for sanding large wood surfaces.
5. A variety of lacquers is used to protect wood.
6. A stain is used for painting wood and hiding the pattern of the grain.
7. Finishes cover wood and provide a color of its own.
8. Varnish, shellac, and lacquer are used for exposing the beauty of the wood.
9. Wax is used for providing a smooth and shiny finish

*IV. Continue the sentence:*

1. Sanding makes wood surfaces smooth for finishing ...
2. Abrasive paper is manufactured for ...
3. A variety of finishes are used ...
4. Woodworkers use ... to color wood and to add a hard, glossy • nish to its surface

*VI. a) Complete the table:*

Noun	Verb	Adjective
–	finish	–
–	–	protected
manufacture	–	–
–	vary	–
–	–	colorful
polish	–	–
–	expose	–
provision	–	–

*b) Choose the word from the table to complete the sentence:*

1. They ... abrasive paper for use by hand and by machines as well.
2. The wood should be cut to its ... size before sanding.
3. A stain is used to ... wood and to bring out the pattern of the grain.
4. ... finishes are used to guard wood and to show the beauty of the grain.
5. The grain of the wood is covered with paint which ... the color of its own.
6. Woodworkers usually use varnish to protect wood from ... to weather.
7. Wax is usually used to protect varnish and to ... wood surface.
8. The main aim of all the finishes used by wood workers is to ... wood and to provide the color of its own.

*VII. Scan the text and answer the questions:*

1. How do woodworkers make wood surfaces smooth for finishing?
2. When should woodworkers begin sanding?
3. For what use is most abrasive paper manufactured?
4. What common sanding material is used in sanding machines?
5. What sanding machines are considered to be the best ones?
6. What do woodworkers use to protect wood?
7. Does a stain hide the pattern and feel of the grain?
8. What are varnish, shellac, and lacquer used for?
9. How do woodworkers make the surface of the wood smooth and shiny?

### **Grammar revision:**

*I. Explain the grammar phenomena underlined in the text.*

*II. Put questions to the following sentences.*

1. Man widely uses aluminium. (general)
2. Iron melts more easily than butter. (What)
3. Our laboratory was provided with all the necessary instruments last year. (When)
4. Everyone can solve this problem. (Who)
5. They had to consult the expert. (Whom)

*III. Open the brackets.*

1. Different kinds of batteries (to use) in radio engineering. 2. Within several years nuclear power stations (to generate) a great amount of electric power. 3. They (to finish) testing the device last week. 4. There (to be) a large physics laboratory at our institute. 5. He (to reject) our proposal.

