Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Локтионова Оксана Геннадьевна
Должность: проректор по учебной работе
Дата подписания: 06.10.2026 17:10:44
Уникальный программный ключ:
0b817ca911e6668abb13a5d426d39e5f1c11eabbf73e943df4a4851fda56d089

МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное образовательное учреждения высшего образования
«Юго-Западный государственный университет»
(ЮЗГУ)

Кафедра иностранных языков

УТВЕРЖДАЮ
Проректор по учебной работе
_____ О.Г. Локтионова
«__» _____ 2026 г.

Technical English (Part 1)

Методические указания для практических занятий и самостоятельной работы
по дисциплине «Иностранный язык» для студентов направлений подготовки 02.03.03, 04.03.01, 09.03.01, 09.03.03, 09.03.04, 10.03.01, 10.05.02, 11.03.02, 11.03.03, 12.03.04, 15.03.06, 18.03.01, 28.03.01, 30.05.03

Курск 2026

УДК 811.111(075.8)

Составитель: Е.А. Таныгина, А.Б. Ставинская

Рецензент
Кандидат филологических наук, доцент *А.В. Анненкова*

Technical English (Part 1) : методические указания для практических занятий и самостоятельной работы по дисциплине «Иностранный язык» для студентов направлений подготовки 02.03.03, 04.03.01, 09.03.01, 09.03.03, 09.03.04, 10.03.01, 10.05.02, 11.03.02, 11.03.03, 12.03.04, 15.03.06, 18.03.01, 28.03.01, 30.05.03 / Минобрнауки России, Юго-Зап. гос. ун-т; сост.: Е.А. Таныгина, А.Б. Ставинская. – Курск, 2026. – 61 с. – Библиогр.: с. 61.

Методические указания предназначены для усвоения необходимого минимума словарного состава текстов по техническим специальностям, включая общенаучную, терминологическую, служебную лексику, и включают в себя тексты для чтения, лексико-грамматические упражнения и тесты. Данное пособие также способствует формированию навыков перевода текста.

Предназначены для студентов направлений подготовки 02.03.03, 04.03.01, 09.03.01, 09.03.03, 09.03.04, 10.03.01, 10.05.02, 11.03.02, 11.03.03, 12.03.04, 15.03.06, 18.03.01, 28.03.01, 30.05.03 очной и заочной форм обучения.

Текст печатается в авторской редакции

Подписано в печать 17.09.26. Формат 60x84 1/16.
Усл.печ. л. 3,5. Уч.-изд. л. 3,2
Тираж 100 экз. Заказ 612 . Бесплатно.
Юго-Западный государственный университет.
305040, г. Курск, ул. 50 лет Октября, 94.

Module 1. INTRODUCTION COURSE

Exercises
(transformation of the sentences according to the models)

1. Replace with the pronouns.

*My father is a teacher. - **He** is a teacher.*

*My mother is a teacher. - **She** is a teacher.*

*My parents are teachers. - **They** are teachers.*

1. Your sister is a journalist. 2. His brother is a driver. 3. His mother and father are doctors. 4. Her grandfather is a scientist. 5. Their grandparents are pensioners. 6. My mother is a dentist. 7. Our parents are artists. 8. Your cousin is a student. 9. Her grandmother is a pensioner. 10. Your brother is a manager.

2. Open the brackets.

I (to be) a student.	*He (to be) a student.*	*She (to be) a student.*
*I **am** a student.*	*He **is** a student.*	*She **is** a student.*
We (to be) students.	*You (to be) students.*	*They (to be) students.*
*We **are** students.*	*You **are** students.*	*They **are** students.*

1. I (to be) a pupil. 2. He (to be) a worker. 3. He (to be) an employee. 4. They (to be) teachers. 5. We (to be) journalists. 6 You (to be) fitters. 7. They (to be) engineers. 8. She (to be) an actress. 9. I (to be) a doctor. 10. We (to be) scientists.

3. Transform into the plural.

***This is** a book. - **These are** books.*

***That is** a book. - **Those are** books.*

1. This is a notebook. 2. This is a clip. 3. That is a pen. 4. This is an article. 5. That is a ruler. 6. This is a composition. 7. That is a pin. 8. This is a journal. 9. That is a disc. 10. This is a cassette.

4. Replace with the absolute forms of the pronouns.

*This is **my** book.*	*This is **her** book.*	*This is **his** book.*
*This is **mine.***	*This is **hers**.*	*This is **his**.*
*This is **your** book.*	*This is **our** book.*	*This is **their** book.*
*This is **yours**.*	*This is **ours**.*	*This is **theirs**.*

1. This is my pen. 2. This is her pencil. 3. This is your dictionary. 4. This is our magazine. 5. This is his newspaper. 6. This is their journal. 7. This is my disc. 8. This is her cassette. 9. This is your composition. 10. This is our ruler.

5. Translate into English.

*Он учитель. - He **is** a teacher.*

*Он **был** учителем. - He **was** a teacher.*

*Они **были** учителями. - They **were** teachers.*

1. Он врач. 2. Его жена — учитель. 3. Их сын — бизнесмен. 4. Их дочь — студентка. 5. Мой папа — юрист. 6. Его брат был музыкантом. 7. Они были музыкантами. 8. Он был студентом. 9. Мои бабушка и дедушка — пенсионеры. 10. Мы были студентами.

6. Open the brackets.

I (to have) a book.	*He (to have) a book.*	*She (to have) a book.*
***I have** a book.*	***He has** a book.*	***She has** a book.*
We (to have) a book.	*You (to have) a book.*	*They (to have) a book.*
***We have** a book.*	***You have** a book.*	***They have** a book.*

1. I (to have) a disc. 2. You (to have) a cassette. 3. They (to have) a newspaper. 4. We (to have) a magazine. 5. He (to have) a notebook. 6. She (to have) an eraser. 7. She (to have) a ruler. 8. I (to have) a clip. 9. You (to have) a com- position. 10. He (to have) an article.

7. Open the brackets.

*My sister (to have) a book. - My sister **has** a book.*

*Our students (to have) books. - Our students **have** books.*

1. His cousin (to have) a composition. 2. Your pupils (to have) rulers. 3. Our parents (to have) magazines. 4. Her mother (to have) journals. 5. My teacher (to have) pencils. 6. My grandparents (to have) newspapers. 7. Their parents (to have) notebooks. 8. My pupils (to have) compositions. 9. Our students (to have) marks. 10. Our sister (to have) discs.

8. Translate into English.

1. У меня есть сочинение. 2. У них есть журналы. 3. У нее есть линейка. 4. У нас есть газеты. 5. У него есть диски. 6. У них есть кассеты. 7. У вас есть карандаши. 8. У меня есть словарь. 9. У нас есть кнопки. 10. У них есть книги.

9. Translate into English.

1. У меня был этот диск. 2. У них были эти кассеты. 3. У нее была эта линейка. 4. У него был этот журнал. 5. У вас были эти сочинения. 6. У нас были эти газеты. 7. У нее был этот блокнот. 8. У него был этот карандаш. 9. У них были эти ручки. 10. У меня были эти булавки.

10. Transform according to the model.

***As a rule**, my mother **knits** sweaters on weekends.*

***Yesterday** my mother **knit** a sweater.*

1. My friend usually reads books on weekends. 2. Sometimes he meets her after classes near the school. 3. She cleans windows on weekends every month. 4. My father always buys magazines after work. 5. As a rule, he translates texts after classes.

11. Transform according to the model.

***As a rule**, my father **reads** newspapers.*

***Tomorrow** my father **will read** newspapers.*

1. My brother's girlfriend often spends much time in the garden. 2. My sister's boyfriend seldom writes letters (will not). 3. My sister's boyfriend usually calls her after classes. 4. He always brings textbooks

from the library of our university. 5. On Mondays he reads newspapers in the reading hall of our university.

12. Open the brackets.

In two days they (to buy) a TV set.

***In two days** they **will buy** a TV set.*

1. In a year my friends (to leave) our city. 2. Next summer they (to swim) in this river. 3. Tomorrow I (to find) my brother's disc. 4. Next Thursday I (to bring) my brother's disc. 5. In a week my parents (to buy) a computer.

13. Open the brackets.

*They (to watch) TV yesterday. - They **watched** TV **yesterday**.*

*They (to see) this film yesterday. - They **saw** this film **yesterday**.*

1. Last year the students (to study) many subjects. 2. Last year she (to teach) many subjects. 3. Yesterday my mother (to wash) windows of our flat. 4. Yesterday his brother (to write) a composition. 5. A week ago we (to catch) a mouse.

14. Translate into English.

1. Как правило, они работают в офисе моего дяди. 2. Они всегда гуляют в парке нашего района. 3. Вчера мои родители купили картину известного художника. 4. На прошлой неделе мы плавали в бассейне нашего университета. 5. Они часто продают книги известных авторов.

15. Translate into English.

1. Его сын всегда получает хорошие оценки в школе. 2. Они всегда работают в саду по воскресеньям. 3. Мои дедушка и бабушка часто покупают газеты. 4. Наш преподаватель обычно задаёт много вопросов. 5. Эта девочка редко помогает мне.

16. Open the brackets.

The composition(s) about holidays always (to write) by the pupils.

*The composition(s) about holidays **is (are) always** written by the pupils.*

1. The letters often (to write) by him with the pencil. 2. The

questions always (to ask) by the teacher. 3. This text usually (to translate) by the students with the teacher's help. 4. As a rule, this journal (to read) by my sister. 5. This newspaper rarely (to buy) by my father.

17. Open the brackets.

The composition(s) about holidays (to write) yesterday.

The composition(s) about holidays ***was (were) written yesterday****.*

1. The letters (to write) by him with the pencil last week. 2. The questions (to ask) by the teacher last Thursday. 3. Yesterday this text (to translate) by the students with the teacher's help. 4. This journal (to read) by my sister last Sunday. 5. A day ago that newspaper (to buy) by my father.

18. Open the brackets.

The composition(s) about holidays (to write) by the pupils next week.

The composition(s) about holidays ***will be written*** *by the pupils* ***next week****.*

1. The letters (to write) by him in a month. 2. The questions (to ask) by the teacher next Thursday. 3. In a week this text (to translate) by the students with the teacher's help. 4. This journal (to read) by my sister next Sunday. 5. Tomorrow that newspaper (to buy) by my father.

19. Translate into English.

1. Лимоны купили вчера. 2. Овощи принесли вчера. 3. Арбуз был съеден час назад. 4. Кашу давно съели. 5. Сок был выпит час назад.

20. Translate into English.

1. Виноград будет выращен в следующем году моим дедушкой. Мясо будет куплено им через час. 3. Свитер будет связан мамой вес- ной. 4. Молоко будет выпито маленьким ребенком ночью. 5. Сметана будет куплена ею в субботу.

21. Translate into English.

1. Как правило, хлеб покупается нашей бабушкой. 2. Обувь

обычно моется мною. 3. Свитер обычно вяжется моей мамой. 4. Кофе часто выбирается моим отцом. 5. Этот журнал, как правило, читается моей сестрой.

Test 1

A. Replace with the pronouns.

1. My uncle is a carpenter.
a) She
b) I
c) He
d) His

2. His daughter is a musician.
a) She
b) He
c) Hers
d) It

3. Their aunt is a manager.
a) He
b) She
c) They
d) Her

4. Our parents are physicians.
a) He
b) We
c) They
d) Our

5. My grandfather and grandmother are pensioners.
a) My
b) They
c) She
d) He

B. Choose the suitable forms of the verbs.

1. His uncle (to be) a fitter.
a) are
b) is
c) am

d) to be
2. My aunt (to have) those books.
a) have
b) to have
c) has
3. I (to be) his cousin.
a) is
b) are
c) am
d) to be
4. Their friends (to be) students.
a) is
b) are
c) to be
d) am
5. His son (to have) this article.
a) has
b) have
c) to have
6. This is my notebook, and that is … .
a) hers
b) your
c) you
d) me
7. … grandparents are pensioners.
a) Me
b) Mine
c) My
d) Hers
8. … are my pencils.
a) That
b) These
c) This
d) We

C. Choose the correct sentences.
1. Two years ago my father (to work) in the office of that joint

venture.

a) Two years ago my father work in the office of that joint venture.

b) Two years ago my father works in the office of that joint venture.

c) Two years ago my father worked in the office of that joint venture.

d) Two years ago my father will work in the office of that joint venture.

2. Next year we (to build) a house.

a) Next year we be build a house.

b) Next year we build a house.

c) Next year we built a house.

d) Next year we will build a house.

3. The friend of my sister seldom (to write) letters.

a) The friend of my sister seldom write letters.

b) The friend of my sister seldom writes letters.

c) The friend of my sister seldom writed letters.

d) The friend of my sister seldom shall write letters.

4. In four days he (to take) these books from the library.

a) In four days he will take these books from the library.

b) In four days he shall take these books from the library.

c) In four days he take these books from the library.

d) In four days he taked these books from the library.

5. Last Thursday I (to spend) much time in the park.

a) Last Thursday I spend much time in the park.

b) Last Thursday I will spend much time in the park.

c) Last Thursday I spent much time in the park.

d) Last Thursday I shall spend much time in the park.

D. Choose the suitable translation of the sentences.

1. Вчера он положил этот журнал в книжный шкаф.

a) Yesterday he put this magazine into the bookcase.

b) Yesterday he putted this magazine into the bookcase.

c) Yesterday he will put this magazine into the bookcase.

d) Yesterday he puts this magazine into the bookcase.

2. Три дня назад она получила письмо от своего друга.

a) Three days ago she get the letter from her friend.

b) Three days ago she got the letter from her friend.
c) Three days ago she will get the letter from her friend.
d) Three days ago she shall get the letter from her friend.
3. Через месяц они покинут этот район нашего города.
a) In a month they will left this district of our city.
b) In a month they left this district of our city.
c) In a month they will leave this district of our city.
d) In a month they shall leave this district of our city.
4. Предложения будут переведены с русского языка на английский.
a) The sentences will be translated from Russian into English.
b) The sentences will translated from Russian into English.
c) The sentences be translated from Russian into English.
d) The sentences shall be translated from Russian into English.
5. Задача была выполнена им.
a) The task was performed by him.
b) The task will be performed by him.
c) The task is performed by him.
d) The task performed by him.

Module 2. DIFFERENT TYPES OF EDUCATION

KEY VOCABULARY

Exercise 1. Read and guess the meanings of the new words.

1) *learning experiences*. Education includes different kinds of learning experiences.

2) *in the broadest sense.* In its broadest sense, education is the ways in which people get knowledge and understanding about the world and about themselves.

3) *to learn skills.* Pupils learn different skills.

4) *to gain knowledge.* People gain knowledge about the world.

5) *scheme.* We'll use this scheme when we discuss the problem.

6) *formal, informal.* We'll discuss formal and informal education.

7) *daily life.* People are involved in learning during their daily life.

8) *with good manners.* Children are taught to eat with good manners.

9) *to ride a bicycle.* Children learn to ride a bicycle.

10) *to take an exam.* He has to take different kinds of exams at the university.

11) *to be in charge of.* The Minister of Education is in charge of education at all the levels.

12) *to expect.* I expect she will pass the exam.

13) *both ... and ...* Education includes both informal and formal ways of learning.

14) *vocational education.* School systems provide both general and vocational education.

15) *gifted, physically or mentally handicapped.* Most countries provide education both for gifted and for physically or mentally handicapped children.

16) *adult.* The country provides education both for children and for adults.

17) *aim.* The aim of vocational education is to prepare students for a job.

18) *intelligent.* She is a very intelligent student.

19) *responsible.* The Minister of Education is responsible for education at different levels.

20) *to transmit.* The information is transmitted from one computer to an- other through a telephone line.

21) *cultural heritage.* The aim of general education is to transmit a common cultural heritage.

22) *carpentry*. Students are taught carpentry, metalwork and electronics at technical schools.

23) *further education.* After leaving school adults may take up further education.

24) *compulsory.* Primary and secondary education is compulsory in most countries.

25) *beyond.* The pupils who stay in school at the age of 16 and beyond this age will prepare for the General Certificate of Education examination at Advanced Level.

26) *to support.* The higher schools in the UK are mainly supported by public funds.

27) *by correspondence.* The Open University in the UK provides degree courses by correspondence.

28) *instead.* It's too wet to go for a walk, let's go to the swimming pool instead.

29) *junior, senior.* High schools in the USA may be junior and senior.

30) *to earn.* He earns much money.

Exercise 2. Try to enrich your vocabulary:

a) analyse the following words with different suffixes and divide them into two groups — nouns and adjectives:

informal, formal, education, different, experience, useful, language, teacher, television, instruction, childhood, learner, nation, general, vocational, special, intelligent, cultural, heritage, specialist, technical, professional, agriculture, architecture, pleasure, educational, public, independent, corporation, correspondence, assistance, Russian, American, conversation, national, attendance;

b) make up as many words as you can by combining different parts of the words:

in-	differ	-ent
	use	-ful
	teach	-er
	learn	-ist
	special	
	depend	

Exercise 3. Divide the following words and word combinations into two groups, those which describe a) informal education; b) formal education.

Library, museum, teacher, schools, colleges, universities, television programme, informal manner, to pass exams, certificate, diploma, degree, general education, vocational education, radio programme.

Exercise 4. Think over the definitions of the words and then:

a) agree or disagree with the following definitions

1. *Skill* is a special ability to do something well, especially as

gained by learning and practice.

2. *Sense* is good and especially practical understanding.

3. *Manner* is the way or method in which something is done or happens.

4. *Adult* is a fully grown person, especially a person over an age stated by law, usually 18 or 21.

5. *Heritage* is an object, custom, or quality which is passed down over many years within a nation, social group, or family, and is thought of as some- thing valuable and important which belongs to all its members.

b) match each word with its correct definition

carpentry, to transmit, experience, to gain, intelligent

1. The art of work of a person who is skilled at making and repairing wooden objects, especially one who does this as a job.

2. Having or showing powers of learning, reasoning or understanding.

3. To send or pass from one person, place, thing to another.

4. Knowledge or skill which comes from practice in an activity or doing something for a long time, rather than from books.

5. To get something useful, wanted.

EXPLORING GRAMMAR

Exercise 1. Read the sentences, point out the Continuous Tenses. Give the Russian equivalents.

1. We use this scheme when we are discussing the problem. 2. Now he is sitting at the lesson. 3. These learners are working now at about the same speed as their classmates. 4. At 10 o'clock tomorrow he will be taking the exam. 5. He is watching TV at the moment. 6. Primary school pupils are being taught such skills as reading, writing, and arithmetic. 7. They were receiving instructions in different subjects the whole month. 8. At the moment the pictures are being described by the pupils. 9. He was visiting the museum from 4 till 6 o'clock yesterday. 10. The classes are being attended by the students all the term.

Exercise 2. Make up your own sentences according to the models.

Model A: *He was visiting the exhibition the whole morning yesterday.*

The exhibition was being visited by him the whole morning yesterday.

1. The family was watching TV from 9 till 11 o'clock yesterday.

2. The whole morning yesterday she was translating the article. 3. Last morning at 10 o'clock he was buying a newspaper at that newsstand. 4. The student was reading the book all evening yesterday. 5. She was writing an article during 3 hours yesterday.

Model B: *She is writing a composition at the moment.*

She will be writing a composition at 9 o'clock tomorrow.

1. He is speaking English now. 2. The student is answering questions at the moment. 3. At present she is attending English classes. 4. He is writing a composition now. 5. The teacher is solving the problem together with his students now.

Exercise 3. Fill in the blanks to streamline the use of the Continuous Tenses. The words in brackets are given to help you.

1. At the moment he … the street (to cross). 2. Tomorrow at 9 o'clock they … a composition (to write). 3. The composition … by him now (to write). 4. Her daughter … the text from 5 till 6 o'clock yesterday (to translate). 5. The children … TV now (to watch). 6. At present the students … the material about the educational system in the country (to study). 7. The material about the educational system … by the students now (to study). 8. At the moment Mary … the book into the bookcase (to put). 9. He … the exam at 10 o'clock tomorrow (to take). 10. The students … texts during the English classes tomorrow (to translate).

Exercise 4. Make up sentences according to the models to practise the use of the Continuous Tenses.

Model A: *Они пишут сочинение сейчас.*

They are writing a composition now.

1. Они посещают музей сейчас. 2. Студенты посещают лекции на протяжении всего семестра. 3. В данный момент они отвечают на вопросы. 4. В настоящее время обучающиеся сдают экзамены. 5. Они переводят текст сейчас.

Model B: *Он переводил статью вчера весь вечер.*
He was translating an article the whole evening yesterday.

1. Он отвечал на вопросы вчера в течение двух часов. 2. Студент готовился к занятиям весь вечер вчера. 3. Она посещала занятия по английскому языку в течение нескольких месяцев в прошлом году. 4. Преподаватель проверял тесты студентов вчера с 15.00 до 17.00. 5. Он читал газету вчера все утро.

READING

Exercise 1. Read the text.

DIFFERENT TYPES OF EDUCATION

Education includes different kinds of learning experiences. In its broadest sense, education is the ways in which people learn skills, gain knowledge and understanding about the world and themselves. A useful scheme for discussing education is to divide these ways of learning into two types: informal and formal.

Informal education involves people in learning during their daily life. For example, children learn their language simply when they listen to others and try to speak themselves. In the same informal manner, they learn to dress themselves, to eat with good manners, to ride a bicycle, or to make a telephone call. Education is also informal when people try to get information or to learn skills on their own initiative without a teacher. They may visit a book shop, library or museum. They may watch TV or listen to the radio. A lot of documentary and educational films and programmes can be watched in the Internet. People do not have to take tests or exams getting informal education.

The learners get formal education at different kinds of schools, colleges, universities. In most countries, people enter a system of formal education during their early childhood. In this type of education, people who are in charge of education decide what to teach. Then learners are studying these things with the teachers' help. Learners should come to school regularly and on time and try to work at about the same speed as their classmates. Learners have to take tests and exams. At the end of their learning, learners may earn a diploma, a certificate, or a degree as a mark of their success over the years.

The school systems of all modern nations provide both general and vocational education. Most countries also offer special education

programs for gifted and for physically or mentally handicapped children. Adult education programs are provided for people who wish to take up their education after leaving school. Most countries are spending a large amount of time and money for formal education of their citizens.

The aim of general education is to make children intelligent, responsible, well-informed citizens. It is designed to transmit a common cultural heritage rather than to develop trained specialists. Almost all elementary education is general education. In every country, primary school pupils are being taught skills they will use throughout their life, such as reading, writing, and arithmetic. They also receive instruction in different subjects, such as geography, history, etc. In most countries almost all young people continue their general education in secondary schools.

The aim of vocational education is primarily to prepare students for a job. Some secondary schools specialize in vocational programs. Technical schools are vocational secondary schools, where students are being taught more technical subjects, such as carpentry, metalwork, and electronics. Technical school students take some general education courses and vocational training. Universities and separate professional schools are preparing students for careers in such fields as agriculture, architecture, business, engineering, law, medicine, music, teaching, etc.

Exercise 2. Agree or disagree with the following statements.

1. There are two types of education. 2. A useful scheme for discussing education is to divide the ways of learning into two types. 3. Informal education involves people in learning during their daily life. 4. Formal education is given at different kinds of colleges. 5. General education is designed to develop trained specialists.

KEY VOCABULARY DEVELOPMENT

Exercise 1. Match the adjectives in column A with the nouns in column B to form meaningful phrases and then identify them at the sentence level in the text. It will help you understand the text in detail.

A	B
1) different	a) childhood
2) formal	b) scheme

3)	useful	c) amount
4)	large	d) education
5)	intelligent	e) subjects
6)	young	f) heritage
7)	good	g) manners
8)	early	h) schools
9)	cultural	i) citizens
10)	technical	j) people

Exercise 2. Decide which of the verbs on the left collocate with the nouns on the right and then identify the word combinations at the sentence level in the text. It will help you understand the text precisely.

1)	to include	a) subjects
2)	to involve	b) knowledge
3)	to learn	c) a call
4)	to gain	d) a show
5)	to ride	e) exams
6)	to make	f) a bicycle
7)	to get	g) people
8)	to enter	h) skills
9)	to watch	i) information
10)	to pass	j) the university

Exercise 3. Try to enrich your vocabulary:

a) find words in the text which have the same meanings as the following words:

to contain, to believe, the means, to study, to get, a kind, to talk, data, various, to be responsible for, a diploma, to want, to continue;

b) find words in the text whose meanings are opposite to the meanings of the following words:

informal, narrow, bad, different, the beginning, old, to give up, small, before;

c) replace the words in italics with the words with similar and opposite meanings:

1. This road is rather *broad*. 2. They study *different* subjects. 3. They want *to continue* their education. 4. The children are eating with

good manners. 5. They were reading the text at *the beginning* of the lesson.

Exercise 4. Complete the sentences: change the word in capitals at the end of each sentence to form a word that fits suitably in the blank space.

1. The British universities are … on the public system of education DEPEND.
2. … expects students to pass the exam TEACH.
3. Students should come to college … REGULAR.
4. Pupils are taught … subjects DIFFER.
5. … study various subjects with the teacher at the head LEARN.

Exercise 5. Insert the words at the sentence level: fill in the blanks with the missing words (the first letter of each word is given).

1. T… their life people are learning different kinds of skills. 2. They g… knowledge about the world. 3. We'll discuss the education using one useful s… 4. Children learn to r… a bicycle. 5. On their own i…, people may visit a museum. 6. The students have to p… exams. 7. They are in c… of education. 8. The students are working at about the same s… 9. Learners may e… a degree. 10. His certificate is a m… of his success over the years.

TEST 2

1. Choose the proper words and fill in the blanks.

1. When we were discussing educational systems of different countries we used ... .

A. skills
B. scheme
C. the ways
D. types

2. It is not difficult to use good ... when you are eating.

A. manners
B. children
C. schemes
D. speed

3. People ... knowledge about the world.

A. pass

B. gain

C. expect

D. support

4. To transmit common cultural heritage is ... of general education.

A. made

B. received

C. the aim

D. the design

5. The children are taught skills they will use ... their life.

A. above

B. throughout

C. though

D. thought

6. In most countries almost all young people ... their general education in secondary schools.

A. continue

B. offer

C. include

D. specialize

7. The system of education in Britain is divided into three stages: ..., secondary, and further education.

A. vocational

B. general

C. primary

D. special

8. British universities are ... corporations, but they are mainly supported by public funds.

A. independent

B. different

C. various

D. unique

9. Each state in the USA is in ... of organizing and regulating its own system of education.

A. responsible

B. nation
C. charge
D. system

10. High schools, ... and senior, provide secondary education in the USA.

A. primary
B. elementary
C. junior
D. vocational

2. The text contains different mistakes: 2 — in spelling, 5 — in grammar. Correct the mistakes and rewrite the text.

In most western nations, advanced general education is often called liberal education, which aim at broad mentall development, and teach learners to study a problem from diferent sides. The branches of learning that help in these development are called liberal arts. This branches includes the humanities, mathematics, and the biological, physical, and social sciences.

Module 3. SCIENCE AND TECHNOLOGY

KEY VOCABULARY

Exercise 1. Read and guess the meanings of the new words.

1) *science, scientist, scientific.* Science deals with facts and relationships among these facts. Scientists may try to solve difficult mathematical problems. They use different scientific methods.

2) *to search, researcher.* Some scientists search for clues to the origin of the universe. Researchers have examined this problem.

3) *to investigate.* Some researchers investigate why we act the way we do.

4) *to unify.* Scientists develop theories that help them order and unify the facts.

5) *to attempt.* Scientists attempt to solve mathematical problems.

6) *to explain.* Scientists try to explain different phenomena.

7) *to prove.* A theory becomes a part of scientific knowledge if it has been tested experimentally and proved to be true.

8) *complicated.* The theory is complicated and hard to comprehend.

9) *to appear.* Many new fields of science have appeared.

10) *boundary.* The boundaries between scientific fields have become less clear.

11) *to interconnect.* All sciences are closely interconnected.

12) *tool.* Different kinds of tools and machines make our life easier.

13) *discovery, invention.* Discoveries and inventions made by scientists help shape our views about ourselves and our place in the universe.

14) *to satisfy.* Technology means the use of people's inventions and discoveries to satisfy their needs.

15) *shelter.* Since people have appeared on the earth, they have had to get food, clothes, and shelter.

16) *steam engine.* Industrial technology began to develop with the invention of the steam engine, the growth of factories, and the mass production of goods.

17) *to contribute.* Science has contributed much to modern technology.

18) *nuclear power.* Some modern technologies, such as nuclear power production and space travel, depend heavily on science.

Exercise 2. Read the international words, mind the stress.

Fact, structure, mathematical, problem, systematic, method, theory, principle, test, group, natural, social, technical, basis, technology, machine, material, industrial, aspect, radio, television, telephone, communication, object, metal.

Exercise 3. Try to enrich your vocabulary:

a) **analyse the following words with different suffixes and divide them into two groups — nouns and adjectives:**

relationship, scientist, structure, researcher, mathematical, systematic, observation, general, scientific, natural, social, technical, numerous, influence, invention, industrial, development, production, different, television, communication;

b) **make up as many words as you can by combining**

different parts of the words:

re-	search	-er
inter-	experiment	-al
	close	-ion
	invent	-
		ment
	general	-ent
	develop	
	connect	
	product	
	differ	
	nation	

Exercise 4. Divide the following words into two groups, those which describe

a) science; b) technology.

Tools, steam engine, knowledge, systematic methods, theory, natural sciences, technical sciences, discoveries, to explain, television, radio, numbers, researchers, scientists, social sciences.

Exercise 5. Think over the definitions of the words and then

a) **agree or disagree with the following definitions:**

1. *Science* is the study of knowledge which can be turned into a system, and which usually depends on seeing and testing facts and stating general natural laws.
2. *Technology* is a branch of knowledge dealing with scientific and industrial methods and their practical use in industry.
3. *Research* is a serious and detailed study of a subject that is aimed at learning new facts, scientific laws, testing ideas, etc.
4. *Tool* is a piece of equipment that is designed to do a particular type of work.
5. *Shelter* is a building or something of the kind that gives protection.

b) **match each word with its correct definition:**

to prove, to search, to unify, to explain, to appear

1. To combine parts of something to form a single whole.
2. To make clear or easy to understand, usually by speaking or

writing.

3. To become able to be seen, to come into sight.

4. To show to be true by means of facts, documents, information, etc.

5. To try to find something or someone by looking carefully.

EXPLORING GRAMMAR

Exercise 1. Read the sentences, point out the Perfect Tenses. Give the Russian equivalents.

1. The boundaries between scientific fields have become less clear. 2. Has he ever researched this problem? 3. Scientific theories consist of general principles or laws that attempt to explain how and why something happens or has happened. 4. They will have translated the text by the end of the lesson. 5. The window had already been opened when they entered the room. 6. The scientific article has been recently written by him. 7. He has never told the truth. 8. He has found shelter in a small village. 9. Many fields of science have appeared. 10. Scientific knowledge has grown and become more complicated.

2.

Exercise 2. Make up your own sentences according to the models.

Model A*: He entered the university last year.*

He has already entered the university.

1. He tested it experimentally two days ago. 2. Yesterday he translated the scientific article. 3. They solved complicated mathematical problems not long ago. 4. She read this book last week. 5. She wrote her composition yesterday.

Model B: *She didn't write an article.*

She hasn't written an article yet.

1. He didn't pass the exam. 2. The scientists didn't test this phenomenon experimentally. 3. They didn't solve the problem. 4. She didn't read the article. 5. He didn't explain why it happens.

Exercise 3. Fill in the blanks to streamline the use of the Perfect Tenses. The words in brackets are given to help you.

1. He … already … this experiment (to do). 2. He … just … the exam (to pass). 3. … you ever … this book (to read)? 4. The article …

just … … by the students (to translate). 5. The scientific conference … … yet (to start).

Exercise 4. Make up sentences according to the models to practise the use of the Perfect Tenses.

Model A: *Они уже исследовали эту проблему.*

They have already investigated this problem.

1. Он только что доказал это экспериментально. 2. Она уже написала статью. 3. Он только что объяснил, почему это происходит. 4. Они уже доказали, что это правильно. 5. Он уже внес большой вклад в развитие науки.

Model B: *К десяти часам они завершат этот эксперимент. By 10 o'clock they will have finished this experiment.*

1. К понедельнику она напишет статью. 2. К следующей неделе он докажет это экспериментально. 3. К двум часам они переведут этот текст. 4. К следующему году он завершит исследование. 5. Научная конференция закончится к пяти часам.

READING

Exercise 1. Read the text, try to focus on its essential facts.

SCIENCE AND TECHNOLOGY

The word "science" comes from the Latin word "scientia" which means "knowledge". Science covers the broad field of knowledge that deals with facts and relationships among these facts.

Scientists study a wide variety of subjects. Some scientists search for clues to the origin of the universe and examine the structure of the cells of plants and animals. Other researchers investigate why we act the way we do or try to solve complicated mathematical problems.

Scientists use systematic methods of study to make observations and collect facts. They develop theories that help them order and unify facts. Scientific theories consist of general principles or laws that attempt to explain how and why something happens or has happened. A theory becomes a part of scientific knowledge if it has been tested experimentally and proved to be true.

Scientific study can be divided into three major groups: natural, social, and technical sciences. As scientific knowledge has grown and become more complicated, many new fields of science have appeared.

At the same time, the boundaries between scientific fields have become less clear. Numerous areas of science overlap and it is often hard to tell where one science ends and other begins. All sciences are closely interconnected.

Science has great influence on our lives. It provides the basis of modern technology — the tools and machines that make our life and work easier.

The discoveries and inventions made by scientists also help shape our view about ourselves and our place in the universe.

Technology means the use of people's inventions and discoveries to satisfy their needs. Since people appeared on the earth, they had to get food, clothes, and shelter. Through the ages, people invented tools, machines, and materials to make work easier. Nowadays, when people speak of technology, they generally mean industrial technology. Industrial technology began to develop about 200 years ago with the invention of the steam engine, the growth of factories, and the mass production of goods. It influenced different aspects of people's lives. The development of the car influenced the way people lived and worked. Radio and television changed their leisure time. The telephone revolutionized communication.

Science has contributed much to modern technology. Science attempts to explain how and why things happen. Technology makes things happen. But not all technology is based on science. For example, people had made different objects from iron for centuries before they learnt the structure of the metal. But some modern technologies, such as nuclear power production and space travel, depend heavily on science.

Exercise 2. Agree or disagree with the following statements.

1. Scientists make observations and collect facts. 2. The boundaries between scientific fields have become less clear. 3. It is easy to tell where one science ends and other begins. 4. Science provides the basis of modern technology. 5. All modern technologies depend on science.

KEY VOCABULARY DEVELOPMENT

Exercise 1. Match the adjectives in column A with the nouns in column B to form meaningful phrases and then identify them at the sentence level in the text. It will help you understand the text in

detail.

A	B
1)broad	a) word
2)systemati	b) problem
3)natural	c) theory
4)Latin	d) principle
5)different	e) groups
6)general	f) methods
7)major	g) field
8)industrial	h) objects
9)scientific	i) technology
10)	mathematical j) sciences

Exercise 2. Decide which of the verbs on the left collocate with the nouns on the right and then identify the word combinations at the sentence level in the text. It will help you understand the text precisely.

1)to cover	a) clues
2)to deal with	b) cells
3)to come from	c) problems
4)to search for	d) tools
5)to examine	e) fields
6)to investigate	f) facts
7)to develop	g) word
8)to divide into	h) theory
9)to provide	i) groups
10)	to shape j) basis
11)	to invent k) views

Exercise 3. Try to enrich your vocabulary:

a) find words in the text which have the same meanings as the following words:

wide, to research, to attempt, to examine, main, complex, difficult, to start, big, a motor, various, to study;

b) find words in the text whose meanings are opposite to the meanings of the following words:

narrow, easy, practice, artificial, old, more, to begin, small, little;

c) replace the words in italics with the words with similar and opposite meanings:

1. He happened to meet her in that *broad* street. 2. They are investigating *complex* problems. 3. It was a very *difficult* experiment. 4. They *started* researching this problem. 5. It was a *big* contribution.

Exercise 4. Complete the sentences: change the word in capitals at the end of each sentence to form a word that fits suitably in the blank space.

1. … examine the structure of the cells SEARCH.
2. The … of radio and television changed our leisure time INVENT.
3. This theory was … proved EXPERIMENT.
4. He has won a prize at the … conference NATION.
5. There are … scientific fields DIFFER.

Exercise 5. Insert the words at the sentence level: fill in the blanks with the missing words (the first letter of each word is given).

1. Science d… with a variety of subjects. 2. Scientists s… for the answers to the different questions. 3. The structure of the cells is e… by scientists. 4. Different theories u… the facts. 5. The b… of some scientific fields are not clear. 6. Natural, social and technical sciences are closely i… 7. T… the ages, people have invented tools, machines, and materials to make work easier. 8. Science c… much to modern technology. 9. Some modern technologies d… on science. 10. During our l… time we watch TV.

TEST 3

1. Choose the proper words and fill in the blanks.

1. *Scientists solve a … of complicated mathematical problems.*

A. origin
B. variety
C. universe
D. cell

2. *The researchers always try to … the facts.*

A. refer
B. measure
C. satisfy

D. unify

3. *When people speak of technology they usually mean ... technology.*

A. medical
B. nuclear
C. educational
D. industrial

4. *... make our life and work easier.*

A. Principles
B. Laws
C. Tools
D. Facts

5. *People had to get food, clothes and ... .*

A. shelter
B. machines
C. cars
D. technologies

6. *Science is ... much to modern technology.*

A. doing
B. making
C. contributing
D. explaining

7. *Science has great ... on our lives.*

A. attempt
B. influence
C. boundary
D. discovery

8. *Industrial technology began to develop with the ... of the steam engine.*

A. technology
B. discovery
C. invention
D. structure

9. *The boundaries between scientific fields have become ... clear.*

A. less
B. more

C. most
D. almost

10. *All sciences are closely … .*

A. investigated
B. unified
C. explained
D. interconnected

2. The text contains different mistakes: 2 - in spelling, 5 - in grammar. Correct the mistakes and rewrite the text.

Computers has changed the way people work. Many tasks which was performed by a large number of people is done now by computers. They provide scintists with understanding of nature. Computers produces new information so quikly that they have change people's views on the world.

Module 4. ENGINEERING IN THE 21st CENTURY

KEY VOCABULARY

Exercise 1. Read and guess the meanings of the new words.

1) *to design*. Engineers design structures, machines, apparatus, or manufacturing processes.

2) *cognizance.* They construct machines with full cognizance of their de- sign.

3) *to utilize, utilization*. Utilization of advanced systems and devices simplify our life.

4) *to encompass.* Engineering encompasses chemical, electrical, civil engineering, and mechanical engineering.

5) *predecessor.* This society was a predecessor of that one.

6) *processing.* Chemical engineering covers areas from biotechnology and nanotechnology to mineral processing.

7) *to overlap.* In each new field, considerable overlap takes place.

8) *core concepts*. Engineering applies the core concepts of mechanics, kinematics, material science, structural analysis to mechanical systems.

9) *to maintain.* Mechanical engineering tries to apply the core

concepts of different sciences to design, manufacture and maintain mechanical systems.

10) *computer-aided engineering, product lifecycle management.* These tools include both computer-aided engineering and product lifecycle management to design manufacturing plants.

11) *heating and cooling systems, robotics.* They design heating and cooling systems, robotics and medical devices.

12) *to emerge.* Mechanical engineering emerged as a field during the industrial revolution in Europe.

13) *to incorporate advancement.* Mechanical engineering incorporates advancements in technology.

14) *to pursue.* Mechanical engineers pursue developments in technology.

15) *to proceed*. They proceed to work on both power-producing and power-using machines.

16) *internal combustion engines.* Mechanical engineers work with power- producing machines such as electric generators, internal combustion engines, steam and gas turbines.

17) *material handling systems.* Material handling systems and robotics are used in manufacturing.

18) *artificial joints, heart valves*. Engineers should design products that are both challenging and exciting, for example, artificial joints and heart valves just to name a few.

19) *tough, flexible, responsive, smart.* Engineers can make materials that are not just lighter, tougher and more flexible but also responsive and smart.

20) *tiny.* They manufacture complex nanocomponents from these materials in order to create tiny machines.

21) *to cope with.* The student has managed to cope with his task.

Exercise 2. Read the international words, mind the stress.

Civilization, process, visualize, robotics, thermodynamics, structural analysis, architect, mechanical, electronic, protect, zone, vibroacoustic, information technology, automatically operated system, logical problem, reduce, optimum design, dynamics, machine.

Exercise 3. Try to enrich your vocabulary:

a) analyse the following words with different suffixes and divide them into two groups — nouns and adjectives:

combination, safety, energy, scientific, difference, mechanical, chemical, automation, engineering, pollution, consumption, considerable, structural, production, operation, different, industrial, advancement, development, generator;

b) make up as many words as you can by combining different parts of the words:

auto-	technology	-er
re-	design	-ance
mis-	vision	-al
nano-	structure	

Exercise 4. Divide the following terms into two groups, those which describe

a) engineering; b) mechanical engineering.

Chemical engineering, to maintain mechanical systems, electrical engineering, machinery, mechanical power, civil engineering, mechanical engineers, to test tools, engines, mechanical devices, internal combustion engines.

Exercise 5. Think over the definitions of the words and then:

a) agree or disagree with the following definitions

1. *Engineering* is application of scientific principles aiming at designing and developing structures, machines, and manufacturing processes.
2. *Mechanical engineering* is the science or profession dealing with studying, designing, or building machines.
3. *Biotechnology* is the use of bacteria and plant/animal cells for industrial or scientific purposes.
4. *Valve* is the part of a machine or piece of equipment that opens and closes in order to control the flow of air or liquid.
5. *Automation* is the process easing working environment.

b) match each word with its correct definition

competence, CAD (computer-aided design), cognizance, tool, concept

1. The process by which you recognize and understand something.

2. A piece of equipment that is designed to do a particular type of work.

3. The process of using drawings made by a computer to design machines, building, etc.

4. Skills, knowledge and suitable experience.

5. The idea of something that exists.

EXPLORING GRAMMAR

Exercise 1. Read the sentences, point out the infinitive. Give the Russian equivalents.

1. They decided to design advanced machines. 2. To utilize these principles is not easy. 3. Some companies hope to create streamlined, in terms of efficiency, safety devices. 4. To reduce hard physical labour engineers should design and develop smart machines. 5. Mechanical engineers plan to use highly energy-efficient machines. 6. The programme targeted on assisting with the design and manufacture of any kind of vehicles. 7. It is our plan to maximize the performance of the car. 8. They have to work together. 9. They should work hard to make a good progress. 10. It is a good question to be discussed.

Exercise 2. Make up your own sentences according to the models.

Model A: *To employ advanced technologies is our target.*

Our target is to employ advanced technologies.

1. To develop machines on the base of advanced materials is a completely new model. 2. To maintain performance excellence is a new concept. 3. To process all parts according to the design is an integral part of modern requirements. 4. To rely on old tools is quite a wrong approach. 5. To gain the lead in many technical fields is our plan.

Model B: *They decided to work on the structural integrity of the vehicle.*

They did not decide to work on the structural integrity of the vehicle.

1. They agreed to use those machines. 2. They wanted to work on power-producing machines. 3. They planned to apply those tools. 4. We

advised to test other devices. 5. He wanted to produce all the components.

Exercise 3. Fill in the blanks to streamline the use of the infinitive. The words in brackets are given to help you.

1. At the moment the engineers should … new methods in their fields (использовать). 2. They have decided … tools (проектировать). 3. We need … a completely new model (испытать). 4. Nowadays mechanical engineers have … developments in such fields as mechatronics and nanotechnology (продолжать). 5. The engineers have managed … more efficient machines (конструировать).

Exercise 4. Make up sentences according to the models to practise the use of the infinitive.

Model A: *The device which we should use is very complex.*

The device to be used is very complex.

1. The proposal which they should discuss is wrong. 2. The progress that she should make is pretty tough. 3. The way which we should choose is the right one. 4. The idea which they should come up with is too promising. 5. The project which we should sign is very profitable.

Model B: *Чтобы подготовить этот доклад, вы должны пойти в библиотеку.*

To prepare this report you should go to the library.

1. Чтобы использовать новые материалы, вы должны установить новое оборудование. 2. Чтобы продвигаться успешно, мы должны провести эксперимент вовремя. 3. Чтобы сконструировать эту модель, вы должны много работать. 4. Чтобы использовать эти машины, их нужно испытать. 5. Чтобы исследовать эту проблему, они должны использовать новые приборы.

READING

Exercise 1. Read the text, try to focus on its essential facts.

ENGINEERING

Engineering is *"the creative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing*

processes, or works utilizing them singly or in combination; or to construct or operate the same with full cognizance of their design; or to forecast their behavior under specific operating conditions; all as respects an intended function, economics of operation or safety to life and property. One who practices engineering is called an engineer, and those licensed to do so may have more formal designations such as Professional Engineer, Chartered Engineer. The broad discipline of engineering encompasses a range of more specialized subdisciplines, each with a more specific emphasis on certain fields of application and particular areas of technology". The American Engineers' Council for Professional Development (ECPD), the predecessor of ABET (Accreditation Board for Engineering and Technology).

Engineering has the following branches: chemical engineering (covering areas from biotechnology and nanotechnology to mineral processing), electrical engineering, civil engineering, mechanical engineering. Beyond these four, historically, naval engineering and mining engineering claim on being major branches as well as aerospace, petroleum, biosystems, biomedical, industrial, and nuclear engineering. New fields are combined with the traditional fields and then form new branches, for example, Earth Systems Engineering and Management that involve such subject areas as anthropology, engineering, environment science, ethics, and philosophy. In each new field, considerable overlap takes place, especially in the areas of application of science to such disciplines as physics, chemistry, and mathematics.

Within our interests lies mechanical engineering. **Mechanical engineering** is known as a branch of engineering that tries to apply the core concepts of physics, mechanics, kinematics, thermodynamics, materials science, structural analysis, materials science to the analysis, design, manufacture, and maintenance of mechanical systems. It is a well-known fact that mechanical engineering involves production and usage of heat and mechanical power for design, production, and operation of machines and tools. To use these core concepts along with different tools, mechanical engineers use both computer-aided engineering and product lifecycle management to design and analyze manufacturing plants. They use them in industrial equipment and machinery, heating and cooling systems, transport systems, aircraft, watercraft, robotics, medical devices, etc.

Mechanical engineering emerged as a field during the industrial revolution in Europe in the 18th century. As for mechanical engineering science, it emerged in the 19th century as a result of developments in the field of physics. Mechanical engineering has managed to incorporate advancements in technology. As a result, today mechanical engineers pursue developments in such fields as composites, mechatronics, and nanotechnology. Mechanical engineering manages to overlap with aerospace engineering, civil engineering, electrical engineering, petroleum engineering, and chemical engineering to various extents. Mechanical engineers' tasks are to research, design, develop, manufacture and to test tools, engines, machines, and other mechanical devices. They proceed to be working on both power-producing machines such as electric generators, internal combustion engines, steam and gas turbines and on power-using machines such as refrigeration and air-conditioning equipment, machine tools, material handling systems, elevators and escalators, industrial production equipment, and robots used in manufacturing. Mechanical engineers also seek to design tools that other engineers need for their work.

Exercise 2. Agree or disagree with the following statements.

1. Engineering encompasses only chemical, electrical, and civil engineering. 2. Mechanical engineering applies core concepts of physics, mechanics, materials science to the design, manufacture, and maintenance of mechanical systems. 3. Mechanical engineers use these core concepts along with different tools. 4. Mechanical engineering emerged in the 17th century. 5. Mechanical engineering overlaps with aerospace engineering, mechatronics, and nanotechnology.

KEY VOCABULARY DEVELOPMENT

Exercise 1. Match the words in column A with the words in column B to form meaningful phrases and then identify them at the sentence level in the text. It will help you understand the text in detail.

A	B
1) scientific	a) advancements
2) manufacturing	b) principle
3) power-using	c) science

4) material	d) machines
5) forecast	e) behaviour
6) computer-aided	f) product
7) product lifecycle	g) management
8) advanced	h) structures
9) incorporate	**i)** knowledge

Exercise 2. Decide which of the verbs on the left collocate with the nouns on the right and then identify the word combinations at the sentence level in the text.

1) to utilize	a) apparatus
2) to design	b) structures
3) to forecast	c) behaviour
4) to encompass	d) machines
5) to create	e) areas
6) to cover	f) subdisciplines
7) to overlap	g) concepts
8) to apply	h) physics
9) to maintain	**i)** systems

Exercise 3. Try to enrich your vocabulary:

a) find words in the text which have the same meanings as the following words:

use, to use, main, to construct, predict, wide, to embrace, field, to pro- duce, various, to investigate, job, to look for;

b) find words in the text whose meanings are opposite to the meanings of the following words:

less, within, old, external, to lose, narrow, the same, unknown;

c) replace the words in italics with the words with similar meanings:

1. Engineering is the creative use of scientific principles *to construct* structures. 2. They planned *to use* those machines. 3. Engineering *embraces* some *fields*. 4. Mechanical engineers *produce* and maintain mechanical systems. 5. Mechanical engineers' tasks are *to investigate*, design, develop, manufacture, and to test tools.

Exercise 4. Complete the sentences: change the word in

capitals at the end of each sentence to form a word that fits suitably in the blank space.

1. Many … do their best to produce advanced machines MANUFACTURE.
2. Social and … damage is also caused by the growing discrepancy between technical competences in different regions ECONOMY.
3. Very small machines, gears, and robots will be applied … in medicine BROAD.
4. A number of problems in different areas will have to be solved within mechanical engineering to turn these still-visionary concepts into … REAL.
5. Mechanical engineering maintains its predominant role thanks to the … and use of new materials and advanced technologies DEVELOP.

Exercise 5. Insert the words at the sentence level: fill in the blanks with the missing words (the first letter of each word is given).

1. It is the branch of e… that involves the production and usage of heat and mechanical power for the design, production, and operation of machines and t… . 2. Mechanical engineering has managed to incorporate a… in technology. 3. Mechanical engineers are pursuing developments in such fields as composites, mechatronics, and n… . 4. Considerable o… exists in each new field. 5. Mechanical engineering tries to apply the c… c… of different sciences. 6. Mechanical engineers design, manufacture and m… mechanical systems. 7. This field e... in the 19th century. 8. They usually use i… c… engines.

TEST 4

1. Choose the proper words and fill in the blanks.

1. ... is the creative application of scientific principles to particular branch.

A. engineering
B. aerospace
C. civil engineering
D. petroleum

2. One who practices engineering is called ... .

A. a charted engineer
B. an engineer
C. a professional engineer
D. a respected engineer

3. Engineering encompasses ... branches.

A. two
B. four
C. three
D. four main and other branches

4. New fields are combined together with the traditional ones ...

.

A. to form new branches
B. to use new concepts
C. to advance existing
D. to overlap

5. In each new field, considerable ... exists.

A. overlap
B. breakthrough
C. gap
D. cover

6. Mechanical engineering is known as a branch of... .

A. engineering
B. aerospace
C. civil engineering
D. industrial engineering

7. Mechanical engineering uses core concepts for the entire life cycle of ... .

A. mechanical systems
B. equipment
C. tools
D. transport system

8. Mechanical engineers pursue developments in such fields as ... .

A. composites
B. nanotechnology
C. chemistry
D. composites, mechatronics, nanotechnology

9. Mechanical engineers design tools that other ... need for the work.

A. engineers
B. scientists
C. managers
D. devices

10. Mechanical engineers design, manufacture, and ... mechanical systems.

A. respect
B. heat
C. combine
D. maintain

2. The text contains different mistakes: 4 — in spelling, 3 — in grammar. Correct the mistakes and rewrite the text.

Mehanical engineering are a scientific and technical basis for machinery advansements. It is due to the fact that it use new materials and enhanced tehnologies. The main goals of engineering is to streamline mashines in terms of efficiency, safety, reliability and ecological performance.

Module 5. FLEXIBLE MANUFACTURING SYSTEMS

KEY VOCABULARY

Exercise 1. Read and guess the meanings of the new words.

1) *flexible manufacturing system (FMS).* FMS is a manufacturing technology.

2) *to incorporate.* FMS incorporates a system view of manufacturing.

3) *to evolve.* The concept of FMSs went on evolving at that time.

4) *to succeed in.* Computerized numerical controls succeeded in bringing a controlled environment to the factory floor.

5) *numerically controlled, direct-numerically-controlled machines.* They managed to control the manufacture using numerically-controlled and direct-numerically-controlled machines.

6) *sophisticated material-handling systems.* Early FMSs contained sophisticated material-handling systems.

7) *incredibly.* Early FMSs were controlled by incredibly complex soft- ware.

8) *flexible cell.* The trend in FMS is towards small versions of the traditional FMS called flexible manufacturing cells (FMC).

9) *to introduce a wide scale automation.* The progress of computing machines allowed introducing a wide scale automation of all branches of industry.

10) *independent development.* The progress of computing machines led to independent development of automation process.

11) *computer-aided designing (CAD).* Automated data processing includes automated control systems and computer-aided designing.

12) *computer-aided manufacturing (CAM).* Automation of production technology includes numerically-controlled equipment, computer- aided manufacturing, and industrial robots.

13) *to be interconnected.* The various cells for machining are interconnected by an automated transport system.

14) *loading, unloading stations.* The various machining cells are interconnected via loading or unloading stations by an automated transport system.

15) *possibility.* This prospect of automation and flexibility presents the possibility of producing non-standard parts.

16) *competitive advantage.* They employ different competitive advantages to maintain a lead in this industry.

17) *to approach.* The general objectives of FMS are to approach the efficiencies and economies of mass production.

18) *small- and medium-lot-size production.* FMS maintains the flexibility required for small- and medium-lot-size production of variety of parts.

19) *to fall within.* Two kinds of systems for manufacturing fall within the FMS spectrum.

20) *generic.* A generic FMS consists of some components.

21) *set-up time, change-over.* A set of stations do not require significant set-up time or change-over between successive jobs.

22) *milling, boring, drilling.* These machines perform operations of milling, boring, drilling, etc.

23) *routing.* Computers direct the routing of jobs through the system.

24) *to be capable of.* Computers are capable of performing complex tasks.

25) *to track.* Computers track the status of all jobs in progress.

26) *to ensure.* A network of supervisory computers and microprocessors is to ensure that the right tools are available for the job.

27) *to provide the monitoring.* Computers provide the monitoring of correct performance of operations.

28) *to require attention.* Computers signal problems requiring attention.

29) *to make customizations.* Machines can be used to assemble different parts and to make customizations.

30) *to implement.* Several companies decided to implement flexible manufacturing systems.

31) *agility.* The common word for today's manufacturer is agility.

Exercise 2. Read the international words, mind the stress.

Computer, control, technology, philosophy, concept, system, version, machine, group, product, problem, central, component, operation, result, cooperation, material, final, automation, complex, instruction, signal.

Exercise 3. Try to enrich your vocabulary:

a) analyse the following words with different suffixes and divide them into two groups — nouns and adjectives:

numerical, technological, automation, operation, flexibility, possibility, arrangement, conversion, requirement, different, flexible, numerical, environment, expensive, version, traditional, development, industrial, various, famous, production, significant, computer, instruction, station, performance;

b) make up as many words as you can by combining different parts of the words:

	move	-or/er	
re-	operate	-ance	-ly
	perform	-tion	
	tradition	-al	
	develop	-ment	

Exercise 4. Divide the following words into two groups, those which belong to

a) automated data processing; b) automation of production technology.

Computer-aided manufacturing, industrial robots, automated control systems, CAM, computer-aided design, numerically-controlled equipment, CAD.

Exercise 5. Think over the definitions of the words which appear in the texts and dialogues and then:

a) agree or disagree with the following definitions

1. *FMS (flexible manufacturing system)* is a manufacturing system in which there is some amount of flexibility that allows the system to react in the case of changes, whether predicted or unpredicted.
2. *CNC (computer numerical control)* is the method of controlling machines by the application of digital electronic computers and circuitry (design or de- tailed plan for an electric circuit).
3. *Agile manufacturing* is the manufacturing that has created the processes, tools, to respond quickly to customers' needs and market changes while still controlling costs and quality.
4. *Flexible* means able to make changes or to deal with the situation that is changing.
5. *A network* is a set of computers that are connected to each other so that each computer can send and receive information to and from other computers.

b) match each word with its correct definition

scale, system, manufacture, robot, component

1. A machine that can do work by itself.
2. One of the different parts that a machine or piece of equipment consists of.
3. A set of connected things that work together for a particular purpose.
4. The size of something, especially when it is big.
5. The process of making goods in large quantities in a factory.

EXPLORING GRAMMAR

Exercise 1. Read the sentences, point out the gerund. Give the Russian equivalents.

1. By changing the speed of machining they significantly increased the performance. 2. We apply different technologies for performing two or more functions simultaneously. 3. They have to analyse manufacturing of automobiles. 4. You may use these technologies for maximizing the performance of the machines. 5. We are interested in producing non-standard parts. 6. It is worth installing new machinery. 7. On checking the set of work stations we found the reason of their failure. 8. Providing monitoring of operations we identified the problems requiring special attention. 9. They are thinking of saving huge amounts of money by switching to flexible manufacturing systems. 10. They missed the opportunity of producing low quality products.

Exercise 2. Make up your own sentences according to the models.

Model A: *They designed that model. They did not use the computer.*

They designed that model without using the computer.

1. They assembled the car parts. They did not use FMS. 2. They improved the processes. They did not increase the price. 3. They performed different operations. They did not make production more flexible. 4. They controlled the production. They did not apply incredibly complex software. 5. They tried to attach doors to the car. They did not use special equipment.

Model B: *When they introduced wide scale automation, independent automation processes began to develop.*

On introducing wide scale automation, independent automation processes began to develop.

1. When we came to the plant, we installed new machinery. 2. When they returned to the workshop, they installed the necessary equipment. 3. When the idea of FMS was proposed, computerized numerical controls succeeded in bringing a controlled environment to the factory floor. 4. When they started to use FMS, they increased the number of units produced per hour. 5. When they completed the manufacturing, they faced many problems.

Exercise 3. Fill in the blanks to streamline the use of the gerund. The words in brackets are given to help you.

1. The microprocessors are capable of … several functions (to perform). 2. FMS is famous for … a manufacturing technology (to be). 3. FMS incorporates a system view of … (to manufacture). 4. The concept of FMS continued … (to evolve). 5. … the monitoring of operations is very important (to provide).

Exercise 4. Make up sentences according to the model to practise the use of the gerund.

Model: *Прочитав эти данные, они рассмотрели вопрос о совершенствовании системы.*

After reading these data they decided to upgrade this system.

1. Изучив данные о применении нового оборудования, производители решили установить новые станки с числовым управлением на все производственные линии. 2. Прочитав информацию о ГАП (гибкое автоматизированное производство), они изменили свое решение. 3. После того как идея ГАП была представлена, она продолжала развиваться. 4. После того как производители изучили все недостатки и преимущества этой системы, они были готовы поддержать новый проект. 5. После того как он рассмотрел схему, он мог назвать компоненты этой системы.

READING

Exercise 1. Read the text, try to focus on its essential facts.

FLEXIBLE MANUFACTURING SYSTEM

Flexible Manufacturing System (FMS) is famous for being both a manufacturing technology and a philosophy. “System” is the key word for a flexible manufacturing system. FMS incorporates a system view of manufacturing. The FMS idea was proposed in England (1960s) under the name “System 24”. It was a flexible machining system that could operate without human operators 24 hours a day but being controlled by a computer.

The concept of flexible manufacturing systems went on evolving at that time when robots, programmable controllers, and computerized numerical controls succeeded in bringing a controlled environment to the factory floor in the form of numerically-controlled and direct-

numerically-controlled machines. Early FMSs were large and very complex, consisting of dozens of Computer Numerical Controlled machines (CNC) and sophisticated material-handling systems. They were too expensive and they were controlled by incredibly complex software.

Currently, the trend in FMS is towards small versions of the traditional FMS, called flexible manufacturing cells (FMC). Today two or more CNC machines are considered a flexible cell and two or more cells — a flexible manufacturing system. The progress of computing machines allowed to introduce a wide scale automation of all branches of industry and led to independent development of automation processes:

– Automated Data Processing: the appearance of Automated Control Systems and Computer-Aided Designing (CAD);

– Automation of Production Technology: the appearance of Numerically-Controlled Equipment, Computer-Aided Manufacturing (CAM) and Industrial Robots.

Thus, a flexible manufacturing system is a group of numerically-controlled machine tools, interconnected by a central control system. The various cells for machining are interconnected via loading and unloading stations by an automated transport system. Simply defined, it is an automated production system that produces one or more families of parts in a flexible manner. Today, this prospect of automation and flexibility presents the possibility of producing non-standard parts to create a competitive advantage. Stated formally, the general objectives of FMS are to approach the efficiencies and economies of mass production, and to maintain the flexibility required for small- and medium-lot-size production of a variety of parts. Two kinds of systems for manufacturing fall within the FMS spectrum: assembly systems for assembling components into final products and systems of forming, which actually form components or final products.

A generic FMS consists of the following components:

– a set of work stations which contain machine tools that do not require significant set-up time or change-over between successive jobs; typically, these machines perform operations of milling, boring, drilling, etc.;

– a material-handling system allowing to move between any

pair of machines so that any job routing can be followed;

– a network of supervisory computers and microprocessors which are capable of performing some or all of the following tasks: directing the routing of jobs through the system; tracking the status of all jobs in progress so it is known where each job is to go next; passing instructions for the processing of the operation to the station; ensuring that the right tools are available for the job; and providing the monitoring of correct performance of operations and signaling problems requiring attention;

– a storage, locally at the work stations, and (or) centrally at the system level.

Exercise 2. Agree or disagree with the following statements.

1. FMS is both a manufacturing process and a philosophy. 2. Early FMSs were small with several CNC machines. 3. Today two or more CNC machines are thought of being a flexible cell and two or more cells make up a flexible manufacturing system. 4. FMS is a group of numerically-controlled machine tools interconnected by a central control system. 5. The main components of FMS are: a set of workstations with machine tools, a material-handling system, a network of supervisory computers and storage.

KEY VOCABULARY DEVELOPMENT

Exercise 1. Match the words in column A with the words in column B to form meaningful phrases and then identify them at the sentence level in the text. It will help you understand the text in detail.

A	B
1) controlled	a) software
2) various	b) system
3) sophisticated	c) scale
4) wide	d) environment
5) flexible	e) controllers
6) programmable	f) robots
7) human	g) controls
8) numerical	h) operator
9) manufacturing	i) technology

10) industrial j) cells

Exercise 2. Decide which of the verbs on the left collocate with the nouns on the right and then identify the word combinations at the sentence level in the text. It will help you understand the text precisely.

1) to incorporate	a) system
2) to propose	b) changes
3) to assemble	c) tools
4) to require	d) functions
5) to perform	e) change-over
6) to interconnect	f) idea
7) to respond to	g) parts
8) to present	h) components
9) to provide	i) environment
10) to produce	**j)** possibility

Exercise 3. Try to enrich your vocabulary:

a) find words in the text which have the same meanings as the following words:

main, to continue, to develop, complex, nowadays, adaptable, information, different, manufacture, purpose, type, to include, to fulfil, through, work, considerable;

b) find words in the text whose meanings are opposite to the meanings of the following words:

unknown, indirect, modern, simple, cheap, less, standard, beyond, disadvantage;

c) replace the words in italics with the words with similar meanings:

1. We are to install a set of work stations containing machine tools which do not require *considerable* set-up time or change-over between successive jobs. 2. They were automated, too expensive and controlled by incredibly *complex* software. 3. They *continue* installing the equipment. 4. There are *different* tools in the workshop. 5. The system *includes* some components.

Exercise 4. Complete the sentences: change the word in

capitals at the end of each sentence to form a word that fits suitably in the blank space.

1. The general objectives of FMS are to approach the … and economies of mass production and to maintain the flexibility required for small- and medium-lot-size production of a variety of parts EFFICIENT.
2. It provides essential monitoring of correct … of operations and signals problems which require attention PERFORM.
3. It led to … development of automation processes DEPEND.
4. FMS is an automated … system PRODUCT.
5. It led to the … of automated control systems APPEAR.

Exercise 5. Insert the words at the sentence level: fill in the blanks with the missing words (the first letter of each word is given).

1. Early FMSs were large and very complex, consisting of dozens of C… N… C… machines (CNC) and s… material-handling systems. 2. A material- handling system is automated and f… . 3. Supervisory computers and microprocessors p… different tasks. 4. FMS i… a system view of manufacturing. 5. The concept of FMS went on e… . 6. Computerized numerical controls s… in bringing a controlled environment to the factory floor. 7. Early FMSs were controlled by i… complex software. 8. The progress of computing machines allowed introducing a wide s… automation of all branches of industry. 9. Flexibility presents the p… of producing non-standard parts. 10. Two kinds of systems for manufacturing fall w… the FMS spectrum.

TEST 5

1. Choose the proper words and fill in the blanks.

1. FMS is … .

A. a technology
B. a cell
C. an idea
D. a manufacturing technology and a philosophy

2. The idea of FMS was proposed under the name … .

A. “system 24”
B. “system 01”
C. “system 12”

D. “system 007”

3. Early FMSs were… .

A. internal
B. chemical
C. electrical
D. large and very complex

4. Two or more CNC. machines are… .

A. a flexible cell
B. FMS
C. a flexible element
D. a set of CNC

5. Two or more cells are … .

A. FMS
B. a control system
C. a set of cells
D. a handling system

6. FMS is a group of … .

A. NC machine tools
B. control system
C. CNC
D. automated controllers

7. The prospect of flexibility is to produce … .

A. non-standard parts
B. spare parts
C. defective parts
D. units

8. Supervisory computers signal about … .

A. problems
B. shortage
C. assessment
D. report

9. An agile manufacturer is … manufacturer on the market.

A. the fastest
B. the slowest
C. the shortest
D. the lowest

10. FMS allows to achieve … .

A. agility
B. barriers
C. obstacles
D. labour force

2. The text contains different mistakes: 2 — in spelling, 4 — in grammar. Correct the mistakes and rewrite the text.

One of the ideas behind FMS are allowing the business to forsee and to prioritize the goals of inovations in technology. Technological barriers are involve in slowing the efforts of be more adaptable. It require additional planning to cope with these obstacles.

Module 6. COMPUTERS

KEY VOCABULARY

Exercise 1. Read and guess the meanings of the new words.

1) *to embed.* Computers have deeply embedded in our lives.

2) *analog computer, digital computer.* We can speak about analog computers and digital computers.

3) *to measure a quantity.* Analog computers worked with physical quantities, such as weight, speed, temperature. They solve problems by measuring a quantity in terms of another quantity.

4) *to deal with numbers.* Digital computers deal with numbers.

5) *at the appropriate time.* A memory unit stores information and makes it available at the appropriate time.

6) *random-access memory (RAM), read-only memory (ROM).*The memory consists of the two main parts called the primary memory — RAM and the secondary memory — ROM.

7) *to perform calculations.* An arithmetic-logical unit performs calculations.

8) *processing unit.* The term “computer” refers to the central processing unit (CPU).

9) *to issue commands.* The central processing unit issues commands to other parts of the system.

10) *to be termed.* An input/output unit is collectively termed I/O.

11) *to insert, to remove.* An input/output unit inserts data into a machine and removes data from it.

12) *hardware*. The visible units are physical components of a

data processing system, or hardware.

13) *to house the motherboard.* The case or chassis houses the motherboard.

14) *systems software, application software*. Software programmes are of two types: system software and application software.

15) *indispensable, irreplaceable.* Computers have become indispensable and irreplaceable in many spheres of our life.

Exercise 2. Read the international words, mind the stress.

Modern, manual, computer, idea, calculate, mathematician, automatic, control, progress, electronics, commercial, terminal, instruction, winchester, disc, result, component, industry, business, scanner, service, voicemail, ma- chine, automatic, system, analog, communication, operation, primitive, data.

Exercise 3. Try to enrich your vocabulary:

a) **analyse the following words with different suffixes and divide them into two groups — nouns and adjectives:**

specialist, general, important, memory, advantage, regular, digital, calculation, available, additional, electronic, visible, processor, communication, basic, numerical, information, computation, initial, likeness, performance, visual, magnetic, arithmetic, general, logical, storage, solution, environment, scanner, adaptable, printer;

b) **make up as many words as you can by combining different parts of the words:**

non-	digit	-ize	-er/-or
un-	adapt	-al	-tion
ir-	standard	-able	
in-	replace	-ive	
	put		

Exercise 4. Divide the following words into two groups, those which describe

a) **computer systems; b) functional units of the computer.**

Analog, input/output devices, control unit, measurement, application software, digital, software, arithmetic-logical unit,

programmes, system programmes, memory, pocket computer, notebook, central processing unit.

Exercise 5. Think over the definitions of the words and then:

a) agree or disagree with the following definitions

1. *Computer* is a programmable machine that can store, retrieve, and process data.
2. *Memory* is a physical device to store such information as data or programmes on a temporary or permanent basis.
3. *Hardware* is mechanical and electronic parts that constitute a computer system, as distinguished from the computer programmes that drive the system.
4. *CPU (central processing unit)* is a principal part of any digital computer system, generally composed of the main memory, a control unit and an arithmetic-logical unit.
5. *Data processing* is manipulation of data by a computer.

b) match each word with its correct definition

character, data, to feed, random, to house

1. Information given in the form of characters.
2. A written language symbol.
3. To place, to locate something.
4. To insert information into the computer.
5. Chosen or happening without any particular method, pattern or purpose.

EXPLORING GRAMMAR

Exercise 1. Read the sentences, point out Participle I and Participle II. Give the Russian equivalents.

1. When entering the Internet, I always find the required information. 2. If compared with the analog computer, digital computers have other functions. 3. When used, voltage represents other physical quantities in analog computers. 4. While dealing with discrete quantities, digital computers count rather than measure. 5. At the moment our computer systems are inputting, storing, processing, controlling, and outputting data. 6. Combined capabilities of both analog and digital computers belong to hybrid computers. 7. Having finished the research, they analysed the data obtained. 8. Having translated the programme

into the machine language, he put it into a computer. 9. Having been well prepared for the test, postgraduates managed to answer all the questions the tutor asked them. 10. When entering data correctly into the computer system, they avoid the need for further adjustments by a person.

Exercise 2. Make up your own sentences according to the models. Model A: *When properly programmed, computers don't err.*

Having been properly programmed, computers don't err.

1. When well regulated, the equipment operates well. 2. When documents correctly filled in, they don't need extra checks. 3. When loaded, the numbers are stored on the platforms of storage. 4. When loaded with cargo, cars can move between stations. 5. When moved, the ball located on the bottom side of the mouse turns rollers.

Model B: *A smartphone is a mobile phone that offers a more advanced computing ability.*

A smartphone is a mobile phone offering a more advanced computing ability.

1. A smartbook is a concept of a mobile device that falls between smartphones and netbooks. 2. A smartbook is a gadget that delivers features found in smartphones. 3. BlackBerry is a line of mobile e-mail that functions as a Personal Digital Assistant (PDA). 4. Twitter is a social and micro blogging service that enables users to send and read other users' messages called tweets. 5. An iPhone is a camera phone that includes text messages, visual voicemail, a portable media player, and web browsing facilities.

Exercise 3. Fill in the blanks to streamline the use of the Participle I and Participle II. The words in brackets are given to help you.

1. A computer is … numbers and orders into memory (to insert). 2. An electronic digital computer is a system … and … a very large amount of data (to process, to store). 3. The computer is a system … numerical computations (to perform). 4. The computer is a device … instructions with extreme speed (to follow). 5. The numbers and the instructions are … in the computer memory (to store). 6. The arithmetic-logical unit is a device … circuits … the arithmetic computations (to

contain, to perform). 7. The codes … by computer designers are … on number of systems (to use, to base). 8. Having been coded the instruction … … to the central processing unit (to be transmitted). 9. … the functions of storage units, we controlled the processing unit (to discuss). 10. … to the CPU, the instructions made an arithmetic-logical unit perform some operations (to deliver).

Exercise 4. Make up sentences according to the models to practise the use of the verbals.

Model A: *Вам следовало бы прочитать об удивительных свойствах компьютера раньше.*

You should have read about wonderful features of computers earlier.

1. Вам следовало бы заказать эти устройства раньше. 2. Ему следовало бы ввести данные в запоминающее устройство раньше. 3. Вам следовало бы раньше рассмотреть эту систему как крупномасштабную цифровую систему. 4. Вам следовало бы знать об этом устройстве раньше. 5. Вам следовало бы выполнить вычисления раньше.

Model B: *Для того чтобы выполнять тысячи вычислительных действий в минуту, были разработаны компьютеры.*

To perform thousands of computations per second computers were designed.

1. Использовались транзисторы для того, чтобы сделать компьютеры более надежными. 2. Для того чтобы сократить время для вычисления, были применены эти устройства. 3. Аналитический двигатель был изобретен для того, чтобы хранить данные. 4. Для того чтобы интегрировать большое количество элементов электронной цепи в маленький чип, транзисторы были уменьшены в размерах. 5. Прикладное программное обеспечение используется для того, чтобы разрешить специальные проблемы, связанные с обработкой различных данных.

READING

Exercise 1. Read the text, try to focus on its essential facts.

COMPUTER LITERACY

A computer is one of the most important items society possesses today. Computers have deeply imbedded in our lives, so we can hardly imagine our life without them. But what is a computer? What are the main parts of this gadget? Let's try to sort it out. As we know, all computer systems perform functions of inputting, storing, processing, controlling, and outputting. So, there should be units performing these functions. The functional units of a digital computer are:

- storage or memory — to store information and make it available at the appropriate time;
- arithmetic-logical unit (ALU) — to perform the calculations;
- control unit (CU) — to control and coordinate data movements within the central processing unit (CPU), between the CPU and the other components of the computer system;
- input/output unit (collectively termed I/O) — to insert data into a machine or to remove them from it for further consideration.

Speaking more precisely, "computer" refers to the central processing unit together with the internal memory. The CU and ALU are collectively known as CPU. The CPU coordinates all the actions performed by various components of the computer, by issuing commands to other parts of the system and by acting on responses.

The memory, one of the basic components, is often called storage. It stores calculation programmes, calculation formulae, initial data, intermediate and final results. Generally, memory consists of two main parts called the primary, or internal memory (RAM), and the secondary, or external memory (ROM). The advantage of the primary memory is an extremely high speed. The secondary memory in its turn has a comparatively low speed, but it can store a far greater amount of information than the primary memory.

Now if we look at the computer, what can we see? The case, or chassis, houses the following units: motherboard holding the CPU and physically connecting all the other main parts of the computer; HDD (hard disc drive, commonly called "winchester" in the youth slang); and a power supply unit. The visible units are physical components of a data processing system, or hardware.

Not visible is the software. Software programmes are of two types: system software and application software. System software is the programmes designed to control the operation of a computer system.

They do not solve specific problems. Application software is the programmes written to solve specific tasks.

Output devices rendering information in the form of words, sounds, and pictures are a monitor, printers, speakers, etc. Input devices, enabling information to pass into a computer are a keyboard, a mouse, scanners, digital cameras, sound cards, etc.

Exercise 2. Agree or disagree with the following statements.

1. Computers have deeply embedded into our lives. 2. All computers perform functions of inputting, storing and controlling. 3. The functional units are storage, a control unit, and input/output. 4. The memory is often called storage. 5. The visible units are hardware, whereas invisible ones are software.

KEY VOCABULARY DEVELOPMENT

Exercise 1. Match the adjectives in column A with the nouns in column B to form meaningful phrases and then identify them at the sentence level in the text. It will help you understand the text in detail.

A		B	
1)	appropriate	a)	speed
2)	functional	b)	results
3)	digital	c)	units
4)	internal	d)	time
5)	initial	e)	information
6)	high	f)	tasks
7)	specific	g)	memory
8)	intermediate	h)	computer
9)	available	i)	components
10)	various	j)	data

Exercise 2. Decide which of the verbs on the left collocate with the nouns on the right and then identify the word combinations at the sentence level in the text. It will help you understand the text precisely.

1) to control	a) problems

2) to solve	b) operations
3) to insert into	c) parts
4) to imagine	d) information
5) to connect	e) data
6) to remove	f) calculations
7) to perform	g) units
8) to house	h) life
9) to store	i) machine
10) to issue	**j)** commands

Exercise 3. Try to enrich your vocabulary:

a) **find words in the text which have the same meanings as the following words:**

significant, to name, device, to fulfil, to insert, parts, storage, different, to contain, to join, to keep, exactly, basic, to get;

b) **find words in the text whose meanings are opposite to the meanings of the following words:**

with, to input, beyond, external, into, approximately, final, low, disadvantage, hardware, invisible;

c) **replace the words in italics with the words with similar meanings:**

1. What are the *basic parts* of this *device*? 2. An arithmetic-logical unit *fulfils* the calculations. 3. The case *contains* several units. 4. The motherboard *joins* the main parts of the computer. 5. Output devices *present* information in the form of words, sounds, and pictures.

Exercise 4. Complete the sentences: change the word in capitals at the end of each sentence to form a word that fits suitably in the blank space.

1. A … computer deals with numbers DIGIT.
2. An input unit inserts data into a machine for further … CONSIDER.
3. A computer has several … units FUNCTION.
4. The secondary memory has a … low speed COMPARE.
5. The secondary memory can store a far … amount of information GREAT.

Exercise 5. Insert the words at the sentence level: fill in the blanks with the missing words (the first letter of each word is given).

1. The memory, one of the basic components, is also called s… . 2. M… stores programmes and formulae. 3. The C… coordinates all functions of the computer. 4. The memory consists of RAM and R… . 5. The C… and ALU are known as the CPU. 6. Memory makes information available at a… time. 7. The ALU performs c… . 8. The CPU i… commands to other parts of the system. 9. RAM is an i… memory. 10. ROM is an e… memory.

TEST 6

1. Choose the proper words and fill in the blanks.

1. The system ... is usually stored in read-only memory.

A. hardware
B. software
C. firmware
D. variety

2. Instructions and data are fed through the ... devices

A. output
B. input
C. control
D. memory

3. A computer can perform very complex numerical…

A. communication
B. instructions
C. computations
D. tasks

4. Numbers and instructions forming the programme are ... in the memory.

A. stored
B. solved
C. settled
D. simulated

5. The control unit serves for ... orders.

A. reading
B. inputting
C. interpreting

D. fulfilling

6. Magnetic disks constitute the ... storage media.

A. internal

B. primary

C. secondary

D. main

7. Magnetic ... were the main elements used in digital computers for many years.

A. cores

B. tapes

C. disks

D. drives

8. Input-output devices allow the computer to ... with its external environment.

A. compute

B. communicate

C. command

D. cooperate

9. Electronic memories have ... capacities for data storage.

A. more

B. larger

C. less

D. similar

10. The control unit ... instructions from the programme.

A. sends

B. changes

C. obtains

D. gains

2. The text contains different mistakes: 2 — in spelling, 4 — in grammar. Correct the mistakes and rewrite the text.

The most comon keyboard device use the QWERTY keyboard. It called a “QWERTY” keyboard because there is the first six letters on the top left of the keyboard. The multimedia input devices is digit kamera, webcam, video capture, scanner, and voice data entry.

Библиографический список:

1. Английский язык для технических вузов : учебник / Т.А. Карпова, Т.В. Асламова, Е.С. Закирова, П.А. Красавин ; под общ. ред. А.В. Николаенко. — М. : КНОРУС, 2014. — 352 с.
2. Меркулова Е.М. Английский язык. Чтение, письменная и устная практика. – СПб.: «Союз», 2007. – 365 с.
3. Farrel, M. British Life and Institutions. – London: Chancerel International Publishers Ltd, 2000. – 144 p
4. Ibbotson M. Professional English in Use. Engineering. Cambridge University Press, 2009.