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МИНИСТЕРСТВО ОБРАЗОВАНИЯ МОСКОВСКОЙ ОБЛАСТИ  
Государственное образовательное учреждение высшего образования Московской области  
МОСКОВСКИЙ ГОСУДАРСТВЕННЫЙ ОБЛАСТНОЙ УНИВЕРСИТЕТ  
(МГОУ)

Кафедра иностранных языков

УТВЕРЖДЕН  
на заседании кафедры иностранных языков  
Протокол от « » 2021г., №  
Зав.кафедрой \_\_\_\_\_ Сарычева Л.В.

**ФОНД  
ОЦЕНОЧНЫХ СРЕДСТВ**

Учебная дисциплина

Иностранный язык в профессиональной коммуникации

Для студентов очной формы обучения

Направление подготовки

06.04.01 Биология

Программа подготовки

**Биоэкология**

Степень **Магистр**

Мытищи  
2021

## 1. Общие положения

Фонд оценочных средств – составная часть основной образовательной программы по соответствующему направлению подготовки и профилю подготовки. Нормативным актом, определяющим порядок видов контроля и аттестации студентов вузов, является «Типовое положение об образовательном учреждении высшего профессионального образования (высшем учебном заведении) Российской Федерации», утверждённое Постановлением Правительства России № 71 от 14 февраля 2008 г. Согласно данному Положению, высшее учебное заведение оценивает качество освоения образовательных программ путём осуществления текущего контроля успеваемости, промежуточной аттестации обучающихся и итоговой аттестации выпускников.

Фонд оценочных средств по дисциплине «Иностранный язык в профессиональной коммуникации» предназначен для контроля знаний, реализуемых по направлению подготовки 06.04.01 «Биология» профиль «Биоэкология».

## 2. Описание показателей и критериев оценивания компетенций на различных этапах их формирования, описание шкал оценивания

п/п	Код и содержание контролируемой компетенции	Основные показатели оценки результатов	Критерии оценивания
1.	УК-4– способен применять современные коммуникативные технологии, в том числе на иностранном языке, для академического и профессионального взаимодействия;	<u>Пороговый</u> знать: особенности делового профессионального общения в академической/научной среде;	ТЕКУЩИЙ КОНТРОЛЬ: практическое задание
		<u>Продвинутый</u> <u>Знать</u> особенности делового профессионального общения в академической/научной среде; <u>Уметь</u> анализировать научные события с оценкой их значимости, высказывать собственное мнение по проблемам, связанным с научной и профессиональной деятельностью.	ТЕКУЩИЙ КОНТРОЛЬ: Практическое задание, сообщение
2.	УК-5 – способен анализировать и учитывать разнообразие культур в процессе межкультурного взаимодействия;	<u>Пороговый</u> знать: стереотипы поведения и общения, формулы этикетной речи.	ТЕКУЩИЙ КОНТРОЛЬ: практическое задание
		<u>Продвинутый</u> <u>Знать</u> стереотипы поведения и общения, формулы этикетной речи. <u>Уметь</u> анализировать и осуществлять межкультурные контакты с зарубежными коллегами, создавать собственные образцы речи в сфере научной и профессиональной коммуникации.	ТЕКУЩИЙ КОНТРОЛЬ: Практическое задание, сообщение

3	ОПК-2 – способен творчески использовать в профессиональной деятельности знания фундаментальных и прикладных разделов дисциплин (модулей), определяющих направленность программы магистратуры.	<u>Пороговый</u> <u>Знать:</u> основные формы устной и письменной речи на основе изученного лексического материала, необходимого для взаимодействия в процессе профессиональной деятельности;	ТЕКУЩИЙ КОНТРОЛЬ: практическое задание
		<u>Продвинутый</u> <u>Знать:</u> основные формы устной и письменной речи на основе изученного лексического материала, необходимого для взаимодействия в процессе профессиональной деятельности; <u>Уметь:</u> анализировать информацию, четко и ясно формулировать мысли, логично и аргументировано излагать свою точку зрения; <u>Владеть:</u> навыком составления и редактирования документов на иностранном языке, а также навыком использования иностранного языка в процессе обсуждения и принятия организационных решений.	ТЕКУЩИЙ КОНТРОЛЬ: Практическое задание, сообщение
			ПРОМЕЖУТОЧНАЯ АТТЕСТАЦИЯ: зачет, экзамен

### Типовые контрольные задания

Контрольно-оценочные средства (КОС) предназначены для контроля и оценки образовательных достижений обучающихся, освоивших программу учебной дисциплины **«Иностранный язык»**. КОС включают контрольные материалы для проведения текущего контроля и промежуточной аттестации.

#### Текущий контроль

Текущий контроль предусматривает проверку отдельных знаний, умений и навыков студентов, полученных до начала обучения или во время обучения по дисциплине. Текущий контроль имеет целью оценить систематичность учебной работы студента в течение семестра. Текущий контроль предназначен для проверки достижения студентом отдельных учебных целей и выполнения части учебных задач программы учебной дисциплины. Формами текущего контроля по дисциплине «Иностранный язык» являются практические задания, сообщения.

**Практическое задание** – система заданий, позволяющая осуществить процедуру измерения уровня знаний и умений обучающегося.

**Сообщение** – конечный продукт, получаемый в результате планирования и выполнения комплекса учебных и исследовательских заданий. Позволяет оценить умения обучающихся самостоятельно конструировать свои знания в процессе решения практических задач и проблем, ориентироваться в информационном пространстве и уровень сформированности аналитических, исследовательских навыков, навыков

практического и творческого мышления. Может выполняться в индивидуальном порядке или группой обучающихся.

Практические задания и сообщения по учебной дисциплине «Иностранный язык» способствуют формированию в дальнейшем при изучении профессиональных модулей, следующих общепрофессиональных и профессиональных компетенций:

- самостоятельно анализировать имеющуюся информацию, ставить задачу, нести ответственность за качество работ и научную достоверность результатов;
- профессионально оформлять, представлять и докладывать результаты научно-исследовательских и производственно-технических работ по утвержденным формам;
- генерировать новые идеи и методические решения;
- уметь представлять учебный материал в устной, письменной и графической форме для различных контингентов слушателей.

### **Комплект практических заданий по дисциплине «Иностранный язык»**

#### **Assignment 1. Read and translate the text:**

##### **What are Transferrable Skills?**

Transferable skills are core skills, which are of value in different situations and jobs. Higher education will give you the opportunity to develop a wide range of transferable skills, which will be of considerable help to you in your further studies or in whatever chosen field of employment you may go into.

The sorts of things that are considered transferable skills are: having self-awareness, being able to communicate clearly with others, having initiative, demonstrating competence with IT, showing commitment to seeing things through to the end, being able to work independently, knowing how to tackle problems when they arise rather than becoming disheartened and giving up, managing all important deadlines, having numeracy skills, being able to lead others as well as being part of a team, presenting your ideas in a way that others can follow and understand, knowing how to undertake research and find evidence, thinking critically and asking the pertinent questions, analyzing evidence and making judgments on the results, bringing enthusiasm to tasks, using a foreign language, being flexible and open-minded, knowing how to network and introduce yourself to others, responding positively to new challenges, being decisive, having business acumen, being proactive.

Through the course of studies, you will have the chance to practice and develop many of these skills, along with numerous subject-specific skills related to your professional field.

**Name five top transferrable skills necessary to a good Master student / artist / teacher / businessperson.**

**Answer the following questions:**

- 1) What transferrable skills do you have?
- 2) What skills would you like to develop in your character?
- 3) What other transferrable skills, not mentioned above, could you name?

#### **Assignment 2. Scan the text in order to find the following information in it:**

- 1) The proportion of young people involved in post-school education in Britain:

*England & Wales* \_\_\_\_\_

*Scotland* \_\_\_\_\_

- 2) Higher education in Britain is received at \_\_\_\_\_

- 3) The first awarded degree \_\_\_\_\_

*The course lasts* \_\_\_\_\_

*Students are called* \_\_\_\_\_

- 4) The next awarded degree \_\_\_\_\_

*The course lasts* \_\_\_\_\_

*Students are called* \_\_\_\_\_

- 5) The highest degree \_\_\_\_\_

*The course lasts* \_\_\_\_\_

- 6) The number of terms \_\_\_\_\_
- 7) Vacations:
1. \_\_\_\_\_  
lasts \_\_\_\_\_
  2. \_\_\_\_\_  
lasts \_\_\_\_\_
  3. \_\_\_\_\_  
lasts \_\_\_\_\_

### Post-school Education in Britain

There is a considerable enthusiasm for post-school education in Britain. A large proportion of young people – about a third in England and Wales and almost half in Scotland – continue in education at a more advanced level beyond the age of 18. The higher education sector provides a variety of courses up to degree and postgraduate degree level, and carries out research. Higher education in Britain is traditionally associated with universities, though education of University standard is also given in other institutions such as colleges and institutes of higher education, which have the power to award their own degrees.

All degree courses last three years, however there are some four-year courses and medical and veterinary courses last five or six years. The British University year is divided into three terms. The vacations – a month at Christmas, a month at Easter, and three or four months in summer – are mainly periods of private study.

Students studying for the first degree are called undergraduates. At the end of the third year of study they sit for their examinations and take the Bachelor's Degree. Those engaged in the study of art subjects such as history, languages, economics or law take Bachelor of Arts (BA). Students studying pure or applied sciences such as medicine, dentistry, technology or agriculture get Bachelor of Science (BSc). When they have been awarded the degree, they are known as graduates.

Students who obtain their Bachelor degree can apply to take a further degree course, usually involving a mixture of exam courses and research. There are two different types of post-graduate courses – the Master's Degree (MA or MSc), which takes one or two years, and the higher degree of Doctor of Philosophy (PhD), which takes two or three years.

### **Assignment 3. Read and translate the text:**

#### **Some Steps to Effective Time Management**

Time management is a key to academic success. Students around the world learn this sooner or later. The best students are not necessarily those who are "smarter", but those who use their time effectively. When you plan your days and weeks in advance, time can be your friend rather than your enemy. Planning can help you get more done with less stress, disorganization and frustration.

Think about it. Have you ever heard of an athlete, even one who is paid millions of dollars a year, playing in a game without showing up for practice? Have you heard of a musician delivering a concert without taking time daily to rehearse? Have you heard of a scientist proclaiming a grand discovery without hundreds of failed trials? All these professionals know that in order to succeed in their professional areas, they have to put in their time.

Unfortunately, millions of students around the world behave otherwise. They appear for exams expecting magic! Without making adequate time to study, they hope to get the highest grades and are then disappointed or ashamed when the results prove otherwise.

There are a number of excellent time management systems that you can follow. Some strategies below could make a huge impact on your academic career.

**1. Organize your time:** Life improves when you decide to do things differently. In this case, the goal is to gain control over time, rather than letting it control you. It is about taking ownership (*владение*) of time, which is the essence (*суть*) of your life. The main objective of time management is for you to have a clear picture of your upcoming days, weeks, and months. It is a way for you to discover what time you have available to devote to study, recreation (*отдых, развлечение*), or other activities. Make the decision to be the master of your life, rather than its suffering slave!

**2. Assess your time:** Many students believe that they study a lot. Some even protest that they study all the time! In reality, this is far from the truth. The only way you will discover how many hours of your busy day you actually study is by completing a personal time assessment. The method requires you to keep track of everything you do for an entire week, from the time you wake up to the time you fall asleep.

That means recording every single detail. At the end of the week, add up the totals. For example, count the number of hours spent on eating, traveling, studying, talking on the phone, shopping, exercising, smoking, watching TV, being online, etc, until you have a complete picture of where your time goes. If you find you are losing a lot of time to activities other than studying, try to balance your schedule.

**3. Set your priorities:** The objective of time management is to allocate (*распределять*) time wisely, so you can achieve your goals. If you wanted to be an Olympic swimmer or ice skater, you would have to practice several hours a day for years. In the same way, to be a top student you must have a good idea of the study requirements. Even though each subject places different demands on you – reading, writing, research, experiments, assignments, essays, projects, papers, presentations, tests, and exams – by prioritizing, you will increase your chances of success. For each subject, decide how to complete all required tasks, over a weekly, monthly, and yearly basis.

**Assignment 4. Study the problems of the following students and recommend them the proper solutions based on the step(s) to effective time management, using the introductory phrases:**

*I (strongly) recommend you (not) to ...*

*Try (not) to ...*

*You'd better (not) ...*

*You should (not) ...*

*You may ...*

**Problem 1. Student A** is enjoying his first year. He has a lot of friends and a great social life. But this doesn't leave much time for work. **A** is anxious and guilty about this and to avoid these feelings he spends even more time going out.

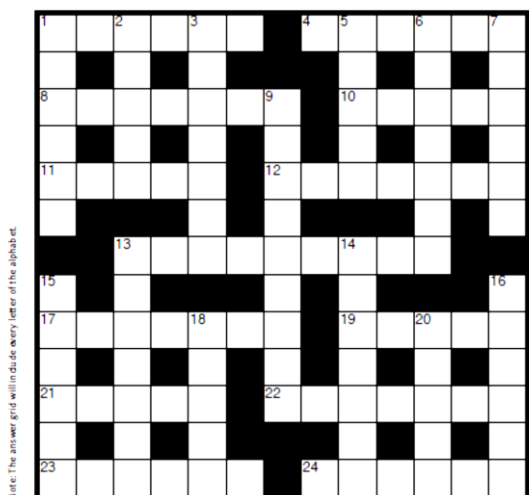
**Problem 2. Student B** is a perfectionist. She works all the time as she finds it hard to be realistic about how much she has to do. Her goals are defined as "I should work harder" or "I must do better". Because she feels that nothing she does is good enough, **B** doesn't know when to stop, so she ends up feeling overwhelmed.

**Problem 3. Student C** leaves everything to the last minute. For **C** this is an attempt to deal with anxiety about his work since it gives him no time to agonize about whether it is good enough. However, putting things off is actually very stressful and **C** encounters difficulties over more complex, long-term projects or if a last minute crisis occurs.

**Problem 4.** Every day **Student D** means to get up at 8.00am and start work, but other things always seem more important. The longer she puts it off, the bigger and more unmanageable her assignment seems. When **D** stops to look it is clear how much time she wastes. She also recognizes that she actually works better at night.

**Assignment 5. Do the crossword.**

## Speaking of Science



Note: The answer grid will include every letter of the alphabet.

BY EMILY COX AND HENRY RATHVON

## ACROSS

1. Volcanic glass full of cavities
4. Otological passages
8. Pisan who championed heliocentrism
10. Grassy South American plain
11. Unit of weight; snow leopard
12. Brand-new brant, perhaps
13. Site of the medulla oblongata (2 words)
17. Type of baleen whale like the humpback or minke
19. Word after *Canis* or *Ursa*
21. Target of a chemical “seeding”
22. Like the dodo, the moa, and *Homo floresiensis*
23. White of the eye
24. Straight-line configuration of three celestial bodies

## DOWN

1. Dove’s city cousin
2. Fruit in the genus *Cucumis*
3. Volcanologist’s depression?
5. Cartology project
6. Reappearance of a lost trait
7. Pore thing?
9. Cellular subunit such as a mitochondrion
13. Rodent hunter on a farm (2 words)
14. Fodder grass that’s also a man’s name
15. Evidence of a dinosaur’s passing
16. Made of small air bubbles, as foam
18. Calf’s feeding station
20. Female donkey

**Assignment 6.****A. Select the most appropriate words from the list below to complete the following paragraph:**

If a cell develops in such a way that it does one particular job very efficiently, it is said to be ..... . Such a cell is also said to be ..... to its function. A nerve cell is ..... for conducting impulses. It can do this efficiently because of its .....and the chemical reactions in its .....

*shape, vacuole, adapted, cytoplasm, size, specialised, mature, mitochondria*

**B. Classify the following under the headings 'Cell structure', 'Tissue', 'Organ' or 'System'.**

*bone, nucleus, skeleton, brain, nerve, mitochondrion, muscle, cytoplasm, epithelium, heart and blood vessels, stomach, alimentary canal, lung, lungs and windpipe*

**Assignment 7.****A. Which of the following statements are true?**

All cells

- (a) are specialised (d) contain chloroplasts
- (b) have a cell wall (e) have a cell membrane.
- (c) have cytoplasm (R)

**B. Match the following functions to the cell structures listed below:**

- (a) controls cell division (c) controls entry of substances into a cell
- (b) produces energy, (d) encloses a plant cell. (R)

*mitochondrion, cell membrane, nucleus, cell wall*

**C. Which of the following are important ‘greenhouse’ gases?**

*oxygen, water vapour, carbon dioxide, nitrogen oxides, ozone, methane, nitrogen*

### **Assignment 8.**

#### **A. Read the following extract which is taken from 'Can clean clothes damage your health?'**

Among the products of biotechnology is the 'biological' washing powder. Enzymes made by bacteria grown in massive fermenters can digest away stubborn stains on clothing, even in tepid water, and thus lower the cost of cleanliness. Enzymes in washing powders have a long history, but they were not introduced into Britain until the mid-1960s. Enzymes are biological molecules -proteins - that can alter the rate of particular chemical reactions but remain unchanged once the reactions are over. Some 2000 enzymes have been classified, and 150 have found commercial uses. Each kind of enzyme speeds up, or catalyses a particular reaction. Thus a small amount of enzyme can bring about a large and precisely controlled change in the appropriate starting materials.

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- (a) Where did the enzymes in washing powders come from?
- (b) How do the enzymes help reduce the costs of washing?
- (c) According to the article, what do enzymes do?
- (d) For how many years have enzymes been used in washing powders in Britain? (C)

#### **B. Put the following events in the most probable order.**

- (a) Predatory birds poisoned by insecticide.
- (b) Trees sprayed with insecticide.
- (c) Earthworms eat leaves which fall from trees.
- (d) Predatory birds eat small birds.
- (e) Beetles damage trees by spreading a virus.
- (f) Insecticide absorbed by tree leaves.
- (g) Small birds eat earthworms.

### **Assignment 9. Read the following passage which is taken from an article, 'The well-nourished vegetarian'. (An 'omnivorous' diet is one which includes meat as well as plant products.) (C)**

The third likely point of difference between vegetarian and omnivorous, diets is in the amount and type of fat in each. There are two main categories of fat in the diet: the triglycerides (most fats are in this category) and cholesterol. Both these classes of fat are also found in the blood. High levels of cholesterol in the blood are clearly related to a high incidence of coronary heart disease (which is the biggest single cause of death among Western men) and the bulk of evidence suggests that the link is causative. A high intake of triglycerides can raise blood cholesterol levels. But triglycerides are of two kinds, saturated and unsaturated; and it seems that whereas the saturated fats do indeed raise blood cholesterol levels, unsaturated fats (or, more specifically, the polyunsaturates, which are very unsaturated) reduce blood cholesterol levels. In general, the fats of animals (hard fats) are highly, saturated, while the oils of plants tend to be unsaturated.

There are notable exceptions: coconut oil, for instance, is highly saturated; and so too are some of the cheap refined oils sold for cooking. But corn, soya, sunflower or safflower oils in particular are highly unsaturated. So in general a vegetarian ought to eat less fat than an omnivore; ought to eat a higher proportion of polyunsaturates; and ought therefore to have lower blood cholesterol and suffer fewer of the diseases associated with high blood cholesterol.

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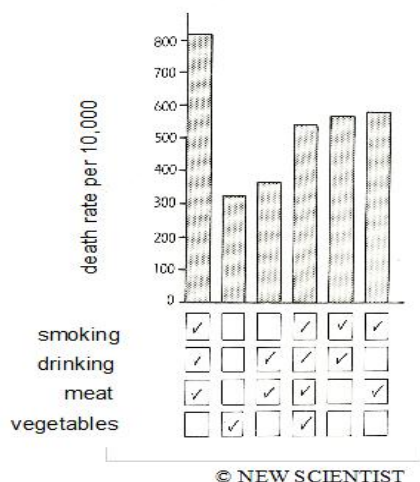
According to the article:

- (a) What are the two main categories of dietary fat?
- (b) What does '... the bulk of evidence suggests that the link is causative.' mean?
- (c) What are the two types of triglyceride?
- (d) Which of these is associated with high blood cholesterol?
- (e) Name a saturated fat (i) from an animal source, (ii) from a plant source.

### **Assignment 10. Read the text.**



A project in Japan, between 1965 and 1981, studied the diets and life-styles of 100,000 people, dividing them into categories according to their smoking and drinking habits, whether they ate meat and had a daily intake of vegetables. By 1981, 30,000 of the sample had died and the mortality rates for six of the groups are shown in the chart.



**Comment on the results with regard to**

- (a) smoking, (b) drinking, (c) eating meat  
(d) eating vegetables each day.

What other information about the trial would you need before you could confidently interpret the results?

**Assignment 11. Read the text and do the tasks.**

Background information Biology is the study of the world in which we live, through controlled and orderly observations and innovations. We study Biology in order to understand and apply knowledge of living things to everyday life. Its goal is to enable us to know ourselves and certain associations that determine sustainable development in the world in which we live. Several Biology subfields have explained special ways of looking at living things. These have led to the acquisition of information on the mode of life systems and integration into the socioeconomic development activities of the community and the environment. Therefore, Biology is not the kind of 'space' in which you should look for improved standards of living only but also develop your ability to critically think and creatively apply knowledge, to understand the universe

***What to do***

- Make a list of professions or types of specialised work that require knowledge of biological Science to produce a product or to provide a service. Consider the areas of nutrition, health, education, environment, tourism, agriculture, sports Science, etc.
- Plan activities based on your professional/specialist choice list, in a role play either by writing a story/a poem/a music piece/drama presentation on the person you want to become in future.
- Present what you have written to your class/school.

**Assignment 12.**

**Answer the following questions:**

1. Why is it difficult to define life? (Give at least two reasons.)
2. What are the characteristics of living matter? (Name at least three.)

**Using your dictionary, translate the following:**

The quality of life emerges on the level of the cell. Just as an atom is the smallest unit of an element, so too the cell is the smallest unit of life. The difference between a living cell and a conglomeration of chemicals illustrates some of the emergent properties of life. Fundamentally, all cells contain genes, units of heredity that provide the information needed to control the life of the cell; subcellular structures called organelles, these being miniature chemical factories that use the information in the genes and keep the cell alive; and a plasma membrane, a thin sheet surrounding the cell that both encloses a watery medium (the cytoplasm) that contains the organelles and separates the cell from the outside world. Some life-forms, mostly microscopic, consist of just one cell, but larger life-forms are composed of many cells whose functions are differentiated. In these multicellular life-forms, cells of similar type are combined into tissues, each performing a particular function. Various tissue types combine to make up a structural unit called an organ. Several organs that collectively perform a single function are called an organ system, and all the organ systems functioning cooperatively make up an individual living thing, the organism.

### **Assignment 13.**

- A. . Compose three sentences which would include all the words and word combinations below. Please pay attention to the examples below. You can use the constructions given there:**

*Examples:*

A cell *consists of/is composed of/comprises* the plasma membrane, the cytoplasm, and subcellular structures.

The plasma membrane, the cytoplasm, and subcellular structures *constitute/comprise* a cell.

The cell includes the nucleus and the cytoplasm.

*hereditary information* an individual *the biosphere* population *microscopic and multicellular life-forms* subcellular structures *non-living matter*

- B. Group these words according to any chosen criterion:**

individual *a community* the plasma membrane *a cell* subcellular structures *conversion of matter and energy* the cytoplasm *a habitat* the flow of matter *organic molecules* proteins *vital functions* genes *metabolism* the biosphere

### **Assignment 14.**

- A. Three tasks presented below are multiple choice tasks. Only one answer in each assignment is correct. Make your choice!**

A.. A scientist examines an organism and finds that it is eukaryotic, heterotrophic, and multicellular and that it absorbs nutrients. She concludes that the organism is a member of the kingdom:

- Bacteria. d. Fungi.
  - Protista. e. Animalia.
  - Plantae. f. Archaea.
2. Which statement is correct?
- Eukaryotic cells are simpler than prokaryotic cells.
  - 'Heterotroph' means 'self-feeder'.
  - Mutations are accidental changes in genes.
  - A scientific theory is similar to an educated guess.
  - Genes are proteins that produce DNA.
3. Which of the following are characteristics of living things?
- They reproduce.
  - They respond to stimuli.
  - They are complex and organized.
  - They acquire energy.
  - All of the above

- B. Match parts of the sentences:**

- |                       |  |
|-----------------------|--|
| 1. I can't admit      | a. my telling him what to do.  |
| 2. The accused denied | b. being treated in such a way.  |
| 3. We dislike         | c. his getting so much money for nothing.                              |
| 4. Do you feel like   | d. going out tonight?  |
| 5. Do you fancy       | e. stealing the money because I was in a different place at that time. |
| 6. Do you mind        | f. my closing the window? There is a draught.                          |
| 7. I strongly resent  | g. being guilty until his execution.                                   |
| 8. He can't stand     | h. playing some old tune?  |

### **Assignment 15.**

**I. Read the text. Some sentences have been taken out of the text and are listed below. Choose the correct sentence (a, b, c, etc.) for each gap in the text (1, 2, 3, etc.):**

(1) ... As a result, the bodies of all organisms use the same basic types of molecules. For this reason, humans can obtain nutrients from her organisms, and our bodies, in turn, can become nutrients for other organisms after we die.

(2) ... How are these molecules formed? What roles do these biological molecules play in our bodies and in the bodies of plants, insects, and fungi? Here we are talking about the basic types of organic molecules — the carbohydrates [ka:bəʊ'haidreits], lipids, proteins ['prəʊti:nz], and nucleic acids — that form the basis of life on Earth.

(3) ... The term is derived from the ability of living organisms to synthesize and use these molecules. *Inorganic* molecules include carbon dioxide and all molecules without carbon, such as water.

Although the common structure and function of the types of organic molecules among organisms afford unity, the tremendous range of organic molecules accounts for the diversity of living organisms and for the diversity of structures within single organisms and even within individual cells. This vast array of organic molecules, in turn, is possible because the carbon atom is so versatile. A carbon atom has four electrons in its outermost shell, with room for eight. (4) ... They become stable by sharing four electrons with other atoms, forming up to four single covalent bonds or fewer double or triple covalent bonds. Molecules with many carbon atoms can assume complex shapes, including chains, branches, and rings.

Organic molecules are much more than just complicated skeletons of carbon atoms, however. Attached to the carbon backbone are groups of atoms, called *functional groups* that determine the characteristics and chemical reactivity of the molecules. (5) ...

(6) ... the use of the same set of functional groups in virtually all organic molecules in all types of organisms and the use of the 'modular approach' to synthesizing large organic molecules.

**Sentences to be put into the spaces left:**

- These functional groups are far less stable than the carbon backbone and are more likely to participate in chemical reactions.
- All of the diverse forms of life, from bacteria and mushrooms to redwood trees and from sea urchins to humans, evolved from a distant common ancestor.
- Therefore, carbon atoms are able to form many bonds.
- The similarity among organic molecules from all forms of life is a consequence of two main features?
- What sorts of basic biological molecules make up living things?
- In chemistry, the term *organic* is used to describe molecules that have a carbon skeleton and also contain some hydrogen atoms.

**II. Give the headline of the text in one word, as a word combination, and a whole sentence.**

### **Assignment 16.**

**I. Think and choose the right answer:**

- Which of the following is not a function of polysaccharides in organisms?
  - Energy storage.
  - Storage of hereditary information.
  - Formation of cell walls.
  - Structural support.

e. Formation of exoskeletons.

2. Characteristics of carbon that contribute to its ability to form an immense diversity of organic molecules include its

- a. tendency to form covalent bonds.
- b. ability to bond with up to four other atoms.
- c. ability to bond together to form extensive, branched, or unbranched carbon skeletons.
- d. All of the above.

3. Foods that are high in fiber are most likely to be derived from

- a. plants.
- b. dairy products.
- c. meat.
- d. fish.
- e. all of the above.

4. Proteins differ from one another because

- a. the peptide bonds linking amino acids differ from protein to protein.
- b. the sequence of amino acids in the polypeptide chain differs from protein to protein.
- c. each protein molecule contains its own unique sequence of sugar molecules.
- d. the number of nucleotides in each protein varies from molecule to molecule.
- e. the number of nitrogen atoms in each amino acid differs from the number in all atoms.

5. Which, if any, of the following choices does not properly pair an organic compound with one of its building blocks (subunits)?

- a. Polysaccharides — monosaccharide.
- b. Fat — fatty acid.
- c. Nucleic acid — glycerol.
- d. Protein — amino acid.
- e. All are paired correctly.

6. Which of the following statements about lipids is false?

- a. Wax is a lipid.
- b. Unsaturated fats are liquid at room temperature.
- c. The body does not need any cholesterol.
- d. Both male and female sex hormones are steroids.
- e. Beef fat is highly saturated.

### **Assignment 17.**

**I. Put paragraphs of the following text in order, then read and translate it:**

#### **Energy Carriers in Cells**

**A** ATP is admirably suited to carry energy within cells. The bonds joining the last two phosphate groups of ATP to the rest of the molecule (sometimes called high-energy bonds) require a large amount of energy to form, so considerable energy can be trapped from exergonic reactions; it readily releases its energy in the presence of appropriate *enzymes*. Under most circumstances, only the bond joining the last phosphate group (the one joining phosphate to ADP to form ATP) carries energy from exergonic to endergonic reactions.

**B** Energy can also be transported within a cell by other *carrier molecules*. In some *exergonic* reactions, including both glucose metabolism and the light-capturing stage of photosynthesis, some energy is transferred to electrons. These energetic electrons (in some cases, along with hydrogen atoms) are captured by electron carriers.

**C** The life span of an ATP molecule is very short, because this energy carrier is continuously formed, broken apart to ADP, and *resynthesized*. More stable molecules, such as *sucrose*, *glycogen*, starch, or fat, store energy in our body for hours, days, or months.

**D** Common electron carriers include *nicotinamide adenine dinucleotide* and its relative *flavin adenine dinucleotide*. Electron-carrier molecules pick up electrons generated by exergonic reactions and hold them in high-energy outer electron shells. Hydrogen atoms are often picked up simultaneously. The electron is then deposited with another molecule to drive an endergonic reaction, typically the synthesis of ATP.

**E** The most common energy-carrier molecule in cells is *adenosine triphosphate*, or ATP. It is a nucleotide composed of the nitrogen-containing base *adenine*, the sugar *ribose*, and three *phosphate* groups. Energy released in cells through *glucose* breakdown is used to drive the synthesis of ATP from adenosine diphosphate (ADP) and *inorganic* phosphate. ATP carries this energy to sites in the cell that perform energy- *requiring* reactions, such as the synthesis of proteins or muscle contraction. The ATP is then broken down to form ADP and inorganic phosphate. During these energy transfers, heat is given off at each stage, and there is a loss of usable energy.

## II. Choose the right answer:

ATP is important in cells because

- it is assembled into long chains that make up cells membranes.
- it acts as an enzyme.
- it accelerates diffusion.
- it transfers energy from exergonic reactions to endergonic reactions.
- all of the above.

## III. Fill in the blanks with appropriate terms from the text:

- Some substances in our organism are formed just for seconds, broken apart and then .....
- If a substance contains no carbon molecules, it is an ..... substance.
- ..... is among common electron carriers.
- The synthesis of proteins is an ..... reaction.
- During exergonic reactions heat is .....

## Assignment 18.

### I. Read the following text about fossils. There are several sentences taken out of the text. Put them into correct places:

As new lands were explored, excavations for roads, mines, and canals revealed that many rocks occur in layers. In some cases, a few strangely shaped rocks or fragments were found embedded within one of these layers. (1)... At first, fossils were thought to be ordinary rocks that wind, water or people had worked into life-like forms. As more and more fossils were discovered, however, it became obvious that they were in fact the remains of plants or animals that had died long ago and been changed into or in some ways preserved in rock. (2)... The classic image of a fossil is of bones or other hard parts (such as shells) that have been transformed into rock by aeons of geological processing. But fossils also include casts, molds, and other impressions that organisms left in ancient sediments before decomposing. Some of the most interesting and informative fossils are the trails, burrows, tracks, or droppings that organisms left behind. (3)...

These windows into the past are fascinating in and of themselves, but the distribution of fossils in rock can also be revealing. After studying fossils carefully, the British surveyor William Smith (1769—1839) realized that certain fossils were always found in the same layers of rock. Further, the organization of fossils and rock layers was consistent: Fossil type A could always be found in a rock layer resting atop an older layer containing fossil type B, which in turn rested atop a still older layer containing fossil type C, and so on.

(4)... Most fossils found in the lowest (and therefore oldest) rock layers were very different from modern forms; the resemblance to modern forms gradually increased upward toward younger rocks, as if here were indeed a ladder of Nature stretching back in time. Many of these fossils were the remains of plant and animal species that had gone extinct — that is, no members of the species still lived on Earth. Putting these facts together, scientists came to the inescapable conclusion that different types of organisms had lived at various times in the past.

- Fossil remains also showed a remarkable progression of form.
- These fossils (from Latin, meaning ‘dug up’) resembled parts or living organisms.

- c. In fact, any tangible trace of an organism that is preserved in rock or sediments is a fossil.
- d. The rapidly accumulating fossil discoveries also revealed that fossils come in many forms.

## II. Find in the text words meaning:

- 1. showed                      5. objects formed by molding
- 2. fixed firmly                6. feces
- 3. unchanged                7. similarity
- 4. ages                        8. no longer existing

## III. Which of the following are fossils?

- 1. Pollen grains buried in the bottom of a peat bog.
- 2. The petrified cast of a clam's burrow.
- 3. The impression a clam shell made in mud, preserved in mudstone.
- 4. An insect leg sealed in plant resin.
- 5. All of the above.

## Assignment 19.

**I. In 1858, Charles Darwin and Alfred Wallace independently described a mechanism for evolution in remarkably similar papers that were presented to the Linnaean Society in London. They stated that the evolutionary theory arises from scientific observations and conclusions based on them. But how did Darwin and Wallace arrive at the conclusion that life's huge variety of excellent designs arose by a process of descent<sup>1</sup> with modification? The chain of logic leading to this powerful conclusion turns out to be surprisingly simple and straightforward. Their theory is summarized below in modern terms. However, the observations and conclusions are not given in the right order. Your task is to match the observations and conclusions and to place them properly.**

**Observation 1:** *Natural populations* of all organisms have the potential to *increase rapidly*, because organisms can *produce* far more *offspring*<sup>2</sup> than are required merely to replace the parents. (A population consists of all the individuals of one species in a particular area.) Nevertheless, the sizes of most natural populations and *the resources available to maintain them* (such as food and *appropriate habitat*) *remain relatively constant* at the time.

**Conclusion ...:** Over many generations, *differential*, or unequal, *reproduction* among individuals with different *genetic makeup* changes the *overall genetic composition* of the population. This process is *evolution by natural selection*.

**Conclusion ...:** Therefore, there is *competition for survival and reproduction*. In each generation, many individuals must die young, *fail* to reproduce, *produce few offspring*, or produce *less-fit* offspring that fail to survive and reproduce in their turn.

**Conclusion ...:** The most well-adapted (the '*fittest*') individuals in one *generation* tend to be the ones that *leave the most offspring*. This is *natural selection*, the process by which the environment selects for those individuals whose traits best *adapt* them to that particular environment.

**Observation ...:** Individual members of a population differ from one another in their ability to *obtain resources*, *withstand environmental extremes*, *escape predators*, and so on.

**Observation ...:** At least some of the *variation* among individuals in *traits*<sup>3</sup> that *affect survival or reproduction* is due to *genetic differences* that may be *passed on* from parent to offspring.

### Notes

<sup>1</sup>**descent** — спуск, снижение; <sup>2</sup>**offspring** — потомок; <sup>3</sup>**trait** — характерная черта, особенность

## Assignment 20.

**I. Read the text and choose the definitions for the words in italic from the list below as in the example a:**

### **Prebiotic Conditions Would Allow Organic Molecules to Accumulate**

Prebiotic synthesis would not have been very efficient or very fast. Nonetheless, in a few hundred million years, large quantities of organic molecules could accumulate, especially because they didn't break down nearly as fast back then. On Earth today, most organic molecules have a short life; either they are digested by living organisms or they react with atmospheric oxygen. *Primeval* Earth lacked both life

and free oxygen, so these sources of *degradation* were absent. However, the *primordial* atmosphere also lacked the ozone layer, a region high in the atmosphere that is enriched with ozone molecules, which absorb some of the sun's high-energy ultraviolet (UV) light before it reaches Earth. During the early history of Earth, before the ozone layer formed, UV bombardment, which can break apart organic molecules, must have been *fierce*. Some places, however, such as those beneath rock *ledges* or at the bottoms of even fairly *shallow* seas, would have been protected from UV radiation. In these locations, organic molecules may have accumulated to relatively high levels.

Even in areas protected from the sun, however, it's unlikely that molecules dissolved in a huge ocean could reach the concentrations necessary to form spontaneously the more complex molecules that arose in the next stage of prebiotic evolution. The chemical reactions in which simple molecules combined to form larger molecules such as RNA and proteins required that the reacting molecules be packed closely together. Scientists have proposed several mechanisms by which the *requisite* high concentrations might have been achieved on early Earth.

One possibility is that shallow pools at the ocean's edge were filled with water by waves crashing onto the shore. Afterward, some of the water in the pool might have evaporated, concentrating the dissolved substances. Given enough cycles of refilling and *evaporation*, the molecules in these pools could have become a concentrated 'primordial soup' in which spontaneous chemical reactions could generate complex organic molecules. These molecules could then have become the building blocks of the first living organisms.

**Definitions of words in italics:**

- a. related to the period when the universe or the Earth first began to exist — *primeval*
- b. the process of the change of a liquid into gas or steam
- c. necessary for a particular purpose
- d. the process of changing into a worse condition
- e. with only a short distance from the top or surface to the bottom
- f. formed when the Earth or universe began
- g. very strong or severe
- h. a narrow surface that continues out from the side of a cliff, wall, or other surface

**Assignment 21.**

**A. Translate the following word combinations:**

1. a developing organism
2. a developed frog
3. a dividing cell
4. the divided world of the 20th century
5. intriguing results of latest experiments
6. intrigued observers of the advance of science
7. a misleading hypothesis
8. a proved theory
9. guided reactions
10. the guiding role of genes
11. failed attempts
12. to develop specialized structures
13. life-sustaining water

**B. Read the sentences below and discuss with your partner, if they are true for you:**

1. I was grown up to believe that life was a gift, and that I had to treasure it.
2. If there is some work to do, I prefer to do it alone.
3. Relatives can never become a source of problems.
4. I don't mind seeing a film, even if it is thought of as a bore.
5. I am looking forward to finding a good job with an international laboratory.
6. It's fun to be working together on one problem.
7. My best friend is thought to have studied in a biologically-biased class at school.
8. One of my teachers is known to have been working on the same problem for ten years.
9. If you are in university to study, most work is to be done at home.

10. I always suggest choosing the shortest way in solving any problem.

### **Assignment 22.**

**Read and translate the text. Summarize some of the methods of biotechnology:**

#### **A DNA Library**

Within the past few years, the technologies of recombinant DNA have mushroomed. We will follow a typical sequence of procedures that might be used to solve a particular problem or to produce a specific product.

The first task in recombinant DNA technology is to produce a DNA library — a readily accessible, easily duplicable assemblage of all the DNA of a particular organism. The entire set of genes carried by a member of any given species is called a genome. Why build a DNA library of a species' genome? A DNA library organizes the DNA in a way that researchers can use it. Restriction enzymes, plasmids, and bacteria are the most commonly used tools in assembling a DNA library.

Many bacteria produce restriction enzymes, which sever DNA at particular nucleotide sequences. In nature, restriction enzymes defend bacteria against viral infections by cutting apart the viral DNA. (The bacteria protect their own DNA, probably by attaching methyl groups to some of the DNA nucleotides.) Researchers have isolated restriction enzymes and use them to break DNA into shorter strands at specific sites.

Most restriction enzymes recognize and sever palindromic sections of DNA, in which the nucleotide order is the same in one direction on one strand as in the reverse direction on other strand. (A palindrome is word that reads the same forward and backward, such as 'madam'.) These single-stranded cut pieces of the DNA fragment are called 'sticky ends', because they will stick to (form hydrogen bonds with) other single- stranded cut pieces of DNA with the complementary series of bases. If the appropriate DNA repair enzyme (called DNA ligase) is added, DNA from different sources cut by the same restriction enzyme can be oined as if the DNA had occurred naturally. Segments of DNA from undamentally different types of organisms, such as bacteria and humans, can be joined if they have complementary sticky ends. Any different restriction enzymes have been isolated from various species of bacteria. Each cuts DNA apart at different but specific palindromic nucleotide sequences. The variety of restriction enzymes has enabled molecular geneticists to identify and isolate specific segments of DNA from many organisms, including humans.

Suppose now that human DNA is isolated from white blood cells and is cut apart into many small fragments with a restriction enzyme. The same restriction enzyme is then used to sever the DNA of bacterial plasmids. Now both human and plasmid DNA have complementary sticky ends that, when mixed, form hydrogen bonds. When DNA ligase is added, it bonds the sugar-phosphate backbones together, inserting segments of human DNA into plasmids.

The new rings of plasmid-human DNA (recombinant DNA) are mixed with bacteria, which take up the recombinant DNA. Millions or billions of plasmids collectively could incorporate DNA from the entire human genome. Usually, 100 to 1,000 times more bacteria than plasmids are used, so that no individual bacterium ends up with more than one recombinant DNA molecule. The resulting population of bacteria containing recombinant plasmid-human DNA constitutes a human DNA library.

### **Assignment 23.**

**A. Match two parts of the sentences:**

1. One can assume this
2. We expect the scope of the research
3. Most people consider science
4. I made my roommate
5. One can watch more and more people
6. You begin naturally to think
7. The author's major concern is to make the reader
8. We can find the consequences of the experiment
  - a. To be astonishingly dramatic.
  - b. to be far from ordinary life.
  - c. clear the room after the party.



- d. such course of events to be a disaster.
- e. to expand greatly.
- f. realize the consequences of tampering with nature.
- g. to be a very simple question.
- h. move into biology from other branches of science.

**B. Translate the following sentences into Russian1:**

1. The history of the last 30 years shows him to have done very well.
2. This allowed the rules to be followed.
3. We know him to have established a school of his own.
4. They considered all water on the surface of the planet to have been liberated by volcanic action.
5. This analysis permitted them to tackle the problem directly.
6. This information enabled forecasts for the next few years to be made.
7. We know him to have objected to this style of research on previous occasions.

**Assignment 24.**

**Complete the text with the correct option A – C. Consult the dictionary if necessary:**

**DNA Fingerprinting: A Tool for Medical Detective**

The use of (1) ..... fragment length (2) ..... (RFLPs) in DNA fingerprinting has caused a (3) ..... in many fields of biology. Nowhere has the impact of this technique been felt more than in forensics, the (4) ..... of information to be used as evidence in court proceedings. First used in a court case in 1986 in which blood (5) ..... from males in an entire British village were tested to solve the rape and murder of two young women, DNA testing has since entered the mainstream of forensic science. Because the PCR (polymerase chain reaction) technique allows (6) ..... of minute quantities of DNA, enough DNA to produce a DNA fingerprint can easily be obtained from a semen stain, cells at the base of a (7) ....., skin fragments found under a victim's fingernails after a struggle, or a speck of dried blood. Forensic scientists have recently discovered that they can swab off objects regularly handled by a suspect, such as a telephone handset, a briefcase handle, or the inside of vinyl gloves, and use DNA fingerprinting on the collected 'fingerprints' themselves.

Some fascinating cases have used DNA from other species to solve murders. When a Phoenix, Arizona, woman was found strangled near a palo verde tree in 1992, the prime suspect denied having been at the crime scene. However, palo verde (8) ..... were found in the bed of the suspect's pickup truck. Homicide (9) ..... turned to Dr Timothy Helentjaris, then at the University of Arizona. In his research on the evolution of crop plants, he had found considerable differences of the DNA fingerprints of (10) ..... plants.

Helentjaris was given the seeds from the suspect's truck along with seeds collected from a dozen palo verde trees in the area, only one of which was near the body. Without knowing which was which, Helentjaris (11) ..... DNA from the seeds and used PCR to amplify it.

DNA fingerprinting showed that the pattern from the seeds found in the truck exactly matched the pattern from only one of the dozen trees — the one nearest the body. In an important additional test, Helentjaris found that this pattern was also different from that of seeds collected from 18 trees at random sites around Phoenix. This information was (12) ..... in (13) ..... the suspect's alibi, and he was found guilty of first-degree murder. DNA fingerprinting, combined with PCR, promises to revolutionize other areas of biology and medicine as well. For instance, a group of British and Russian scientists used PCR to identify the remains of the Russian royal family, Tsar Nicholas Romanov II, his wife, Alexandra, and three of their five children.

In 1997, Oxford researchers using DNA fingerprinting were able to (14) ..... the longest (15) ..... (16) ..... ever traced. They extracted DNA from the bones of a 9000-year-old skeleton found in 1903 in a (17) ..... near the town of Cheddar, England. Wondering if (18) ..... of the 'Cheddar Man' might still live in the area, they analysed DNA from local families; amazingly, they found a match in a Cheddar schoolteacher.

1 A destruction

B restriction

C retraction

2 A polymerisms	B polymorphisms	C polyolithisms
3 A revolution	B revolt	C riot
4 A collocation	B gathering	C collection
5 A examples	B species	C samples
6 A amplification	B implication	C simplification
7 A shaft of bone	B shaft of feather	C hair shaft
8 A weeds	B reeds	C seeds
9 A researchers	B investigators	C explorers
10 A individual	B separate	C detached
11 A elicited	B derived	C extracted
12 A critical	B crucian	C crucial
13 A demolishing	B embellishing	C abolishing
14 A pounce	B renounce	C announce
15 A humane	B human	C humanistic
16 A lineage	B linkage	C linage
17 A cave	B cavity	C hollow
18 A descendants	B ancestors	C ascendants

### **Assignment 25**

#### **I. Read the text. Do you agree with the author?**

##### **A Throw-Away Society**

I entered a big supermarket to shop: I needed several cans of drinks, a few chocolates, a disposable tablecloth and some paper tissues, plastic glasses and plates (not to wash the dishes afterwards) and a number of items one would buy when their friends are coming to your place to relax and have fun. I packed everything into big celluloid bags, free to be taken by anyone, and left carrying with me two dozens of objects rapped in various kinds of plastic to throw away 40 % of what I had bought as rubbish. I think it doesn't surprise anyone nowadays that we have to throw many things away after using them. We do not know what to do with a colourful wrapping or an empty box of chocolates. These things can be easily bought next time you are in a shop. So we throw them away. We do not know where to put industrially used materials. So we pour them into the sea or deposit them in huge cemeteries of rubbish. A human being has become so used to having everything new and shining that one would spend all his or her money to buy a new mobile phone even if the old one is still working. It is fashionable. It is reliable. For a society to become environmentally aware, more than just a course of lectures at a school or college is needed. One may listen to a hundred lectures but what can he do if he is made to throw away half of the things he's bought? We do not pay attention to that — it has become normal. Dustbins are being filled every day with new tons of rubbish. ecycling has become a major issue in the previous century and no doubt it is being much thought about today. Most European and some Asian countries have started recycling programmes, and one can find three dustbins for different kinds of waste products in the garden of the average Englishman. The garbage is then collected and sent to special factories that use recycled materials to produce new things. To recycle is to survive.

### **Assignment 26**

#### **Read the text. The exercise after the text will help you with the new words:**

##### **The Discovery of the Double Helix**

**A.** In the early 1950s, many biologists realized that the key to understanding inheritance lay in the structure of DNA. They also knew that whoever deduced the correct structure of DNA would receive recognition from fellow biologists, fame in the popular press, and very possibly the Nobel Prize. Less obvious were the best methods to employ and who would be the person to do it.

**B.** The betting favourite in the race to discover the structure of DNA had to be Linus Pauling of Caltech. Pauling probably knew more about the chemistry of large organic molecules than did any person alive, and he had realized that accurate models could aid in deducing molecular structure. Like Rosalind Franklin and Maurice Wilkins, Pauling was an expert in X-ray diffraction techniques. Finally, he was almost frighteningly brilliant. In 1950s, he demonstrated these traits by showing that many proteins were coiled into single-stranded helices. Pauling, however, had two main handicaps. First, for years he had concentrated on protein research, and therefore he had little data about DNA. Second, he was active in the

peace movement. During the early 1950s, some government officials, including Senator Joseph McCarthy, considered such activity to be potentially subversive and possibly dangerous to national security.

**C.** The second most likely competitors were Wilkins and Franklin, the English scientists who had set out to determine the structure of DNA by the most direct procedure, namely the careful study of the X-ray diffraction patterns of DNA. They were the only scientists who had very good data about the general shape of the DNA molecule. Unfortunately for them, their methodical approach was also slow. **D.** The door was open for the eventual discoverers of the double helix, James Watson and Francis Crick, two young scientists (American and English, respectively) with neither Pauling's tremendous understanding of chemical bonds nor Franklin and Wilkins's expertise in X-ray analysis. They did have three crucial advantages: (1) the knowledge that models could be enormously helpful in studying molecular structure, a lesson learned from Pauling's work on proteins; (2) access to the X-ray data; and (3) a driving ambition to be first.

**E.** Watson and Crick did no experiments in the ordinary sense of the word; rather, they spent their time thinking about DNA, trying to construct a molecular model that made sense and fit the data. Because they were based in England and because Wilkins was very open about his and Franklin's data, Watson and Crick were familiar with all the X-ray information relating to DNA. This information was just what Pauling lacked. Because of Pauling's presumed subversive tendencies, the US State Department refused to issue him a passport to leave the United States, so he could neither attend meetings at which Wilkins presented the X-ray data nor visit England to talk with Franklin and Wilkins directly.

**F.** Watson and Crick knew that Pauling was working on DNA structure and were terrified that he would beat them to it. In his book *The Double Helix*, Watson recounts his belief that, if Pauling could have seen the X-ray pictures, 'in a week at most, Linus would have the structure'.

**G.** You might be thinking now, 'But wait just a minute! That's not fair. If the goal of science is to advance knowledge, then everyone should have access to all the data. If Pauling was the best, he should have discovered the double helix first.' Perhaps so. But science is an activity of scientists who, after all, are people too. Although virtually all scientists want to see the advancement and benefit of humanity, each individual also wants to be the one responsible for that advancement and to receive the credit and the glory. The ambition to be first helps inspire the intense concentration, the sleepless nights, and the long days in the laboratory that ultimately produce results.

**H.** Linus Pauling remained in the dark about the correct X-ray pictures of DNA and was beaten to the correct structure. When Watson and Crick discovered the base-pairing rule that was the key to DNA structure, Watson wrote a letter about it to Max Delbruck, a friend and advisor at Caltech. He asked Delbruck not to reveal the contents of the letter to Pauling until their structure was formally published. Delbruck, perhaps more of a model scientist, firmly believed that scientific discoveries belong to the public domain and promptly told Pauling all about it. With the class of a great scientist and a great person, Pauling graciously congratulated Watson and Crick on their brilliant solution of the DNA structure. The race was over.

**I. In paragraphs A—H of the text find words meaning the following:**

1. praise, respect or admiration (A)
2. the person or animal who is expected to win the competition (B)
3. correct or true in every detail (B)
4. very intelligent (B)
5. a disadvantage that prevents you from doing something well (B)
6. intended to destroy the power of the government (B)
7. to start working in order to achieve an aim (C)
8. in the order in which they were mentioned (D)
9. special skill or knowledge that you get from experience, training or studying (D)
10. to do something before someone else (F)
11. to say what happened (F)
12. praise for something you have done or achieved (G)
13. after a process or activity has ended (G)
14. to make known (something secret or hidden) (H)

## Assignment 27

**A. Read the following passage about Gregor Mendel's life. Find six false facts in the story below:**

Before settling down as a monk in the monastery of St Thomas in Brünn (now Brno, in the Czech Republic), Gregor Mendel tried his hand at several pursuits, including teaching health care. To earn his medical certificate, Mendel attended the University of Vienna for 2 years, where he studied botany and mathematics only. This training proved very important to his later experiments, which were the foundation for the modern science of genetics. At St Thomas in the mid-1700s, Mendel carried out both his monastic duties and broke ground in a series of experiments on inheritance in the common edible pea. Although Mendel knew little about genes or chromosomes, we can more easily follow his experiments after a brief look at some modern genetic concepts.

**B. Match parts of the sentences and translate the resulting text into both Russian and English:**

1. Bacteria from the DNA library are sparsely distributed over a culture...  
a. ...последовательность нуклеотидов, комплементарных нужному гену.
2. Each bacterium multiplies into a visible bacterial population (called a colony)...  
b. ...на чашку для культивирования.
3. A sheet of special filter paper is pressed...  
c. ...чашках, воспроизводя нужный ген.
4. It picks up a few bacteria from each colony, ...  
d. ...местоположением бактериальных колоний на первоначальной чашке для культивирования.
5. The original culture dish... e. ...содержащей питательную среду.  
e. ...содержащей питательную среду.
6. The filter paper is placed in a basic solution, breaking open the bacteria, freeing the plasmids, and...  
f. ...содержащую единичный тип комбинации «плазмида — ДНК человека».
7. The paper is bathed in solution of neutral pH that contains a DNA probe (yellow),...  
g. ...бактерий, содержащих плазмиды с нужным геном.
8. The probe hydrogen-bonds only to plasmid DNA that is complementary to the nucleotide sequence of the probe and...  
h. ...разделяя двунитевую ДНК плазмид на одиночные нити.
9. The locations of radioactivity on the paper are matched to the...  
i. ...следовательно, содержит человеческий ген.
10. Colonies in the same position consist of...  
j. ...остается в сохранности.
11. Samples of these bacteria are now cultured in new...  
k. ...сохраняя позиции колонии.

**Assignment 28**

**I. Read the extract from a textbook and write out all the terms relevant to the topic of the unit and their definitions contained in the text:**

A gene's specific physical location on a chromosome is called a locus (plural 'loci'). Homologous chromosomes carry the same genes, located at the same loci. Although the nucleotide sequence at given gene locus is always similar on homologous chromosomes, it may not be identical. These differences allow different nucleotide sequences at the same gene locus on two homologous chromosomes to produce alternate forms of the gene, called alleles. Human A, B, and O blood types, for example, are produced by three alleles of the same gene.

If both homologous chromosomes in an organism have the same allele at a given gene locus, the organism is said to be homozygous at that gene locus. ('Homozygous' comes from Greek words meaning 'same pair'.) If two homologous chromosomes have different alleles at a given gene locus, the organism is heterozygous ('different pair') at that locus and is called a hybrid. During meiosis, homologous chromosomes are separated, so each gamete receives one member of each pair of homologous chromosomes. Therefore, all the gametes produced by an organism that is homozygous at a particular gene locus will contain the same allele. Gametes produced by an organism that is heterozygous at the same gene locus are of two kinds: half of the gametes contain one allele, and half contain the other. (...)

Mendel's choice of the edible pea as an experimental subject was critical to the success of his experiments. In plants, a male gamete, which for simplicity we'll call the sperm, is contained in each

pollen grain. The structure of the pea flower normally prevents another flower's pollen from entering. Instead, each pea flower normally supplies its own pollen, so the egg cells in each flower are fertilized by sperm from the pollen of the same flower. This process is called self-fertilization. Even in Mendel's time, commercial seed dealers sold many types of peas that were true-breeding. In true-breeding plants, all the offspring produced through self-fertilization are homozygous for a given trait and are essentially identical to the parent plant.

Although peas normally self-fertilize, plant breeders can also mate plants by hand, a process called cross-fertilization. Breeders pull apart the petals and remove the stamens, preventing self-fertilization. By dusting the carpels with pollen they have selected, breeders can control cross-fertilization. In this way, two true-breeding plants can be mated to see what types of offspring they produce.

In contrast to earlier scientists, Mendel chose to study traits — heritable characteristics — that are unmistakably different forms, such as white flowers versus purple flowers, and he worked with one trait at a time. These factors allowed Mendel to see through to the underlying principles of inheritance. Equally important was the fact that Mendel counted the numbers of offspring with each type of trait and analysed the numbers. The use of statistics as a tool to verify the validity of results has since become an extremely important practice in biology.

**II. Add to the list of terms the following and write their definitions in English:**

- |                                |   |
|--------------------------------|---|
| 1. first-generation offspring  | 8. phenotype                                  |
| 2. second-generation offspring | 9. the Punnett square method (by R.C.Punnett) |
| 3. parental generation         | 10. test cross                                |
| 4. Mendel's law of segregation | 11. linkage                                   |
| 5. dominant allele             | 12. crossing over                             |
| 6. recessive allele            |   |
| 7. genotype                    |   |

**Assignment 29**

**II. Complete the text with the correct option A – C:**

***Mycorrhizae* Are Fungi Associated with the Roots of Many Plants**

Mycorrhizae (*single* 'mycorrhiza') are important (1) ..... associations between fungi and plant roots. Over 5,000 species of mycorrhizal fungi (mostly basidiomycetes) are known to grow in intimate (2) ..... with the roots of about 80% of all plants that have (3) ....., including most trees. These associations (4) ..... both the plant and its fungal partner. The (5) ..... of mycorrhizal fungi surround the plant root and commonly invade the root cells. The fungus digests and absorbs minerals and organic nutrients from the soil, passing some of them directly into the root cells. The fungus also absorbs water and passes it to the plant — an advantage in dry, sandy soils. In return, sugar produced photosynthetically by the plant is passed from the root to the fungus. Plants that participate in this unique relationship, especially those in poor soils, tend (6) ..... and more vigorously than do those deprived of the fungus. (7) ..... new data suggest that mycorrhizae and other types of fungi may be undergoing a (8) ..... decline that could threaten the health of forests and the communities of plants and animals that rely on them.

Some scientists believe that mycorrhizal associations may have been important in the invasion of land by plants more than 400 million years ago. Such a relationship between an aquatic fungus and a green alga ((9) ..... to terrestrial plants) could have helped the alga (10) ..... the water and mineral nutrients it needed to survive out of water.

- |                    |                    |                |
|--------------------|--------------------|----------------|
| 1 A symbolic       | B symbiotic        | C symptomatic  |
| 2 A association    | B assortment       | C assimilation |
| 3 A stems          | B branches         | C roots        |
| 4 A benefit        | B do harm          | C destroy      |
| 5 A hyphal         | B hyphen           | C hyphae       |
| 6 A to grow larger | B to grow together | C to grow lean |
| 7 A Exciting       | B Encouraging      | C Disturbing   |
| 8 A tragic         | B dramatic         | C bad          |
| 9 A ancestral      | B predecessor      | C ancestor     |
| 10 A require       | B quire            | C acquire      |

**Assignment 30**

**A. a) Check the Russian translation of the words and phrases below:**

- |  |   |
|--|---|
| 1. peptides                                | a. amino-acid derivatives               |
| 2. steroids                                | b. prostaglandins                       |
| 3. target cells bind to receptors          | c. intracellular second messengers      |
| 4. cyclic AMP                              | d. diffuse through the plasma membranes |
| 5. the hormone-receptor complex            | e. the transcription of specific gene.  |
| 6. thyroid hormones                        | f. negative feedback                    |
| 7. to inhibit further secretion of hormone | g. the mammalian endocrine system       |
| 8. clusters of cells                       | h. a network of capillaries             |
| 9. the thyroid and parathyroid glands      | i. the pancreas                         |
| 10. the adrenal glands                     | j. the pineal gland                     |
| 11. thymus                                 | k. the hypothalamus — pituitary complex |

**B. Think and choose the right answer:**

1. Steroid hormones .....
  - a. alter the activity of genes.
  - b. trigger rapid, short-term responses in cells.
  - c. work via second messengers.
  - d. initiate open channels in plasma membranes.
  - e. bind to cell-surface receptors.
2. Examples of posterior pituitary hormones are .....
  - a. FSH (follicle-stimulating hormone) and LH (luteinizing hormone).
  - b. prolactin and parathormone.
  - c. secretin and cholecystokinin.
  - d. melatonin and prostaglandin.
  - e. ADH (antidiuretic hormone) and oxytocin.
3. Negative feedback to the hypothalamus controls the level of ..... in the blood.
  - a. thyroxine
  - b. estrogen
  - c. glucocorticoids
  - d. insulin
  - e. all of the above
4. The primary targets for FSH are cells in the .....
  - a. hypothalamus.
  - b. ovary.
  - c. thyroid gland.
  - d. adrenal medulla.
  - e. pituitary gland.
5. The kidney is a source of .....
  - a. thyroxine and parathormone.
  - b. calcitonin and oxytocin.
  - c. renin and erythropoietin.
  - d. ANP (atrial natriuretic peptide) and epinephrine.
  - e. glucagon and glucocorticoids.
6. Hormones that are produced by many different body cells and cause a variety of localized effects are known as .....
  - a. peptide hormones.
  - b. parathormones.
  - c. releasing hormones.
  - d. prostaglandins.
  - e. exocrine hormones.

**Assignment 31**

# I. Look through the text. Put all the paragraphs in order:

## The Evolution of Hormones

**A** Thyroxine regulates the seasonal molting of most vertebrates. From snakes to birds to the family dog, surges of thyroxine stimulate the shedding of skin, feathers, or hair. In humans (who neither migrate regularly, metamorphose, nor molt), thyroxine regulates growth and metabolism.

**B** The use of chemicals to regulate cellular activity is extremely ancient. The diversity of life on Earth rests upon a conservative foundation: a relative handful of chemicals coordinate activities within single cells and among groups of cells. Life's diversity originated in part by changing the systems used to deliver the chemicals and by evolving new types of responses. Early in their evolution, animals developed a complemented to hormonal communication that provides faster, more precise delivery of chemical messages: the nervous system. The nervous system permits rapid responses to environment stimuli, flexibility in response options, and ultimately consciousness itself.

**C** Not long ago, vertebrate endocrine systems were considered unique to our phylum, and the endocrine chemicals were thought to have evolved expressly for their role in vertebrate physiology. In recent years, however, physiologists have discovered that hormones are evolutionarily ancient. Insulin, for example, is found not only in vertebrates but also in protists, fungi, and bacteria, although research has not yet determined the function of insulin in most of those organisms. Protists also manufacture ACTH, even though they have no adrenal glands to stimulate. Yeasts have receptors for estrogen but no ovaries. Thyroid hormones have been found in certain invertebrates, such as worms, insects, and molluscs, as well as in vertebrates. Even among vertebrates, the effects of chemically identical hormones, secreted by the same glands, may vary dramatically from organism to organism. Let's look briefly at the diverse effects that the thyroid hormone thyroxine has on several different organisms.

**D** In amphibians, thyroxine has the dramatic effect of triggering metamorphosis. In 1912, in one of the first demonstrations of the action of any hormone, the tadpoles were fed minced horse thyroid. As a result, the tadpoles metamorphosed prematurely into miniature adult frogs. In high mountain lakes in Mexico, where the water is deficient in the iodine needed to synthesize thyroxine, natural selection has produced one species of salamander that has the ability to reproduce while still in its juvenile form.

**E** Some fish undergo radical physiological changes during their lifetimes. A salmon, for example, begins life in fresh water, migrates to the ocean, and returns to fresh water to spawn. In the stream where the salmon hatched, fresh water tends to enter the fish's tissues by osmosis; in salt water, the fish tends to lose water, becoming dehydrated. The salmon's migrations, therefore, require complete revamping of salt and water control. In salmon, one of the functions of thyroxine is to produce the metabolic changes necessary to go from life in streams to life in the ocean and back.

## Assignment 32

### A. Match the words in A with their definitions in B and translate them into Russian:

**A**

- |                    |                      |
|--------------------|----------------------|
| 1. homeostasis     | 5. endocrine gland   |
| 2. salivary gland  | 6. hypothalamus      |
| 3. pituitary gland | 7. negative feedback |
| 4. retina          |                      |

**B**

- a multilayered sheet of nerve tissue at the rear of camera-type eyes, composed of photoreceptor cells plus associated nerve cells that refine the photoreceptor information and transmit it to the optic nerve
- a situation in which a change initiates a series of events that tend to counteract the change and restore the original state. In physiological systems it maintains homeostasis
- a ductless, hormone-producing gland consisting of cells that release their secretions into the extracellular fluid from which the secretions diffuse into nearby capillaries
- an exocrine gland that releases saliva into the mouth
- a region of the brain that controls the secretory activity of the pituitary gland; synthesizes, stores, and releases certain peptide hormones; directs autonomous nervous responses
- an endocrine gland, located at the base of the brain, that produces several hormones, many of which influence the activity of other glands
- the maintenance of a relatively constant environment required for the optimal functioning of cells, maintained by the coordinated activity of numerous regulatory mechanisms, including the respiratory, endocrine, circulatory, and excretory systems

## **B. Read and translate the text.**

### **Life**

All of us have an intuitive understanding of what it means to be alive. However, defining life is difficult, partly because living things are so diverse and non-living matter looks like life in some cases. What's more, living things cannot be described as the sum of their parts. The quality of life emerges as a result of incredibly complex, ordered interactions among these parts. Among the characteristics of living things that, taken together, are not shared by non-living things are the following: living things consist of organic molecules, they acquire and use materials and energy from their environment and convert them into different forms, they grow and reproduce.

### **Assignment 33**

**Read and translate the following text:**

#### **Robot Cricket Finds Her Mate**

The cheerful chirping of a cricket is actually the 'call song' of the male as he attempts to attract a female. The female follows the song unerringly, deftly detouring around obstacles and ignoring other sounds en route to her prospective mate. How intelligent is this apparently purposeful behaviour? Barbara Webb, a psychologist at the University of Edinburgh, Scotland, attacked this problem in a novel way; she built robot female cricket. Webb's goal was to find out whether mate-finding behaviour could be distilled down to taxes, relatively simple responses to stimuli, such as responses that could be wired into an electronic robot (and thus wired into genetically predetermined neural connections). Although its tangle of wires appears bewildering, the circuitry of the robot is trivial when compared with the potential complexity of neural connections — even in a cricket's brain.

On the laboratory bench, a loudspeaker 'male cricket' broadcasts its species-specific call song: short, regularly repeating tones. As the robot rolls forward, microphonic ears conduct the song to electronic circuitry that filters it from other sounds and adds together the repeating syllables of the song that reach each ear. The summed sounds in the ear closest to the loudspeaker reach a critical threshold level first, activating a mechanism that turns the robot toward the sound. The turning halts when an equal intensity of sound hits both ears. Sensory 'bumpers' help the robot detour around obstacles. The success of 'robocricket' surpassed Webb's expectations; it not only found its 'mate' but it unexpectedly mimicked other cricket-searching behaviours. Placed between two loudspeakers that broadcast at equal volume, the robot, like a real cricket, arbitrarily chose one speaker. If the repeating syllables of the song were altered between the two speakers, the robot (again, like a real cricket) first positioned itself exactly between them, then made an arbitrary choice. The electronic circuitry provides insights into mechanisms that could be used by a simple nervous system to produce complex adaptive behaviour.

### **Assignment 34**

**Complete the abstract with the correct option A – C. Consult the dictionary if necessary:**

#### **Animals May Defend Territories That Contain Resources**

In many animal (1) ....., (2) ..... for (3) ..... takes the form of territoriality, the defence of an area where important resources are located. The (4) ..... resources may include places to mate, raise young, feed, or store (5) ....., Territorial animals generally (6) ..... most or all of their activities to the defended area and (7) ..... their presence there. Territories may be defended by males, females, a mated pair, or entire social groups (as in the case of defence of their nest by social insects). However, territorial behaviour is most commonly seen in adult males, and territories are normally defended against members of the same species, who compete most directly for the resources being protected. For example, they can be a tree where a woodpecker stores acorns, small (8) ..... in the sand used as nesting sites by cichlid fish, a hole in the sand used as a home by a crab, or an area of forest (9) ..... food for a squirrel.

(10) ..... and defending a territory require considerable time and energy, yet territoriality is seen in animals as diverse as worms, arthropods, fish, birds, and (11) ....., The fact that organisms as unrelated as worms and humans independently (12) ..... similar behaviour suggests that territoriality provides some important (13) ....., (14) ....., Although the particular benefits depend on the species and the type of territory it defends, some broad generalizations are possible. First (as with dominance hierarchies), once a territory is established through aggressive interactions, relative peace (15) ..... as boundaries are recognized and respected. The saying 'good fences make good neighbours' also applies to



nonhuman territories. One reason for this (16) ..... is that an animal is highly motivated to defend its territory and will often defeat even larger, stronger animals that attempt to invade it. (17) ..... , an animal outside its territory is much less secure and more easily defeated.

For males of many species, successful territorial defence has a direct impact on reproductive success. In these species, females are attracted to a high-quality (18) ..... territory, which might have features such as large size, (19) ....., food, and secure nesting areas. Males who successfully defend the most desirable territories have the greatest chance of mating and passing on their genes. For example, experiments have shown that male sticklebacks that defend large territories are more successful in (20) ..... mates than are males who defend small territories. Females who select males with the best territories increase their own (21) ..... success and pass their genetic traits (typically including their mate-selection preferences) to their offspring.

Territories are advertised through (22) ....., sound, and (23) ..... . If the territory is small enough, the owner's mere presence (24) ..... by aggressive displays at (25) ....., can be a (26) ..... defence. A mammal that owns a territory but cannot always be present may use pheromones to scent-mark its terrestrial boundaries. Male rabbits use pheromones secreted by glands in their chin and by anal glands to mark their territories. Hamsters rub the areas around their (27) ..... with secretions from special glands in their glands.

1 A specimen	B species	C samples
2 A competence	B competition	C competency
3 A resources	B reserves	C supply
4 A defended	B defeated	C deseeded
5 A meal	B nourishment	C food
6 A restrict	B refrain	C restore
7 A advise	B adverse	C advertise
8 A destinations	B depressions	C degressions
9 A supplying	B procuring	C providing
10 A Acquiring	B Requiring	C Requiting
11 A mammas	B mammoths	C mammals
12 A evoked	B evolved	C involved
13 A adaptive	B adoptive	C abortive
14 A disadvantages	B disabilities	C advantages
15 A prevails	B prevents	C prewires
16 A aspect	B extent	C respect
17 A Inversely	B Conversely	C Diversely
18 A breeding	B blooming	C brooding
19 A abundant	B redundant	C excessive
20 A detracting	B attracting	C attributing
21 A creative	B productive	C reproductive
22 A seeing	B sight	C vision
23 A smell	B scent	C fragrance
24 A force	B enforce	C reinforce
25 A interveners	B intruders	C interrupters
26 A sufficient	B suffocating	C suffruticose
27 A fangs	B teeth	C dens

### **Assignment 35**

**Match the terms (1-6) with their definitions (A-F).**

1. Corpus callosum

A. A pair of structures, originating from the forebrain, that contain the centers concerned with the major senses, voluntary muscle activities, and higher brain functions, such as language and memory.

2. Cerebral hemispheres

B. Describes phenotypic character or condition recognizable at, and usually before, birth. The term usually refers to hereditary or inborn conditions that are most often harmful.

3. Stroke

C. A clear watery fluid containing glucose, salts, and a few white blood cells, that are found in the internal cavities and between the surrounding membranes of the central nervous system. It cushions and protects nerve tissues.

4. Cerebrospinal fluid

D. A paroxysmal event due to abnormal, excessive, hypersynchronous discharges from an aggregate of CNS neurons. Epilepsy is diagnosed when there are recurrent numerous events due to a chronic, underlying process.

5. Seizure

E. A thick band of nerve fibers that connects the two cerebral hemispheres in the brain of placental mammals. It enables coordination of the functions of the two hemispheres.

6. Congenital

F. A rapidly developing loss of brain function(s) due to disturbance in the blood supply to the brain, caused by a blocked or burst blood vessel.

### **Assignment 36**

#### **A. Give definitions to the following terms connected with water:**

to dehydrate / to rehydrate

to condense

fluid

water balance

hormone

kidney

sweating

evaporation

#### **B. Match the following terms (1-4) with their definitions (a-d):**

1. Obesity

a. A unit of energy in the metric system.

2. Calorie

b. A medical condition in which excess body weight has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems.

3. Randomised control trial

c. A plan of care written by a physician or other health care professional.

4. Prescription

d. A specific type of scientific experiment, and the gold standard for a clinical trial.

### **Assignment 37**

#### **A. Read the following definitions of ecology and choose the most suitable one from your point of view:**

Ecology is a branch of science dealing with the relations of plants and living things to each other and to their environment.

Ecology is the natural relationship between plants, animals and people, and the places where they live.

#### **B. Study the difference between these words:**

*Ecology, ecological, environment, environmental.*

These words are sometimes used in the same way although they have different meanings. We have already defined the term “ecology”, and the adjective connected with ecology is ecological. Environment refers to the places or situations in which plants, animals and people live. The adjective “environmental” has the same meaning. Sometimes “ecological” and “environmental” are used with the same nouns and have the similar meaning.

### **Assignment 38**

**A. Find Russian equivalents for the following English words and expressions:**

argument  
cell  
cellular  
despite/in spite of  
diverse  
efficient  
living things  
photosynthesis  
substance  
surroundings  
survival  
to argue for centuries  
to be accepted  
to be capable of  
to be unresolved  
to capture the energy  
to convert the energy  
to reproduce  
to respond to

**B. Read and translate the following text:**

**Characteristics of Living Things**

Making up a list of the characteristics of living things is not as easy as it might sound. In fact, scientists have argued for centuries over the basic characteristics that separate life and nonlife. Some of these arguments are still unresolved. Despite these arguments, there do seem to be some generally accepted characteristics common to all living things. We can state with some confidence that all living things: are made up of one or more units called cells, · reproduce, · grow and develop, · obtain and use energy, respond to their environment.

**Assignment 39**

**A. Fill in the correct word(s) from the list below:**

a body of knowledge  
carrying out research  
an invaluable tool  
to bring about  
to keep healthy  
fruitful  
an entire living organism  
despite different arguments  
comes to an end

1. The whole course in General Biology attempts ... .. an understanding of the terms “bios” (life) and “logos” (study or science).
2. Science is viewed as ... .. accumulated over centuries.
3. The knowledge of biology helps us ... .. and also enables people to solve many scientific and everyday problems.
4. In ... .. modern biologists use the scientific method that covers several stages.
5. In almost all areas of biology the computer has become ... .. that can be used to perform complex tasks and analyse quantities of data.
6. The symbiosis of sciences is extremely ... ..
7. ... .. there do seem to be some generally accepted characteristics common to all living things.
8. A single cell itself can form ... ..
9. The ability to reproduce ... ..

**B. Match the following words with the definitions:**

- |                 |  |
|-----------------|--|
| 1. contribution | A quality of not being the same                          |
| 2. disease      | B plant with seeds in pods, used for food                |
| 3. explanation  | C science or practice of farming                         |
| 4. variety      | D statement, fact, circumstance that make plain or clear |
| 5. science      | E giving ideas, suggestions, helping to bring about      |
| 6. zoologist    | F tendency to pass characteristics on to offspring, etc. |
| 7. heredity     | G illness; disorder of body or mind or of plants         |
| 8. inheritance  | H knowledge arranged in an orderly manner                |
| 9. pea          | I deriving qualities from ancestors                      |
| 10. agriculture | J expert in the science studying animals                 |

**Assignment 40****Put each of the following words in its place in the passage below:**

conservatism	stability	building	national	vision
associations	gardening	living	thatched	pond
opportunities	privilege	common	health	crime

**The Love of Nature**

Most of the British live in towns and cities. But they have an idealized \_\_\_\_\_ (1) of the countryside. To the British, the countryside has almost none of the negative \_\_\_\_\_ (2) which it has in some countries, such as poor facilities, lack of educational \_\_\_\_\_ (3), unemployment and poverty. To them, the countryside means peace and quiet, beauty, good \_\_\_\_\_ (4) and no \_\_\_\_\_ (5). Most of them would live in a country village if they thought that they could find a way of earning a \_\_\_\_\_ (6) there. Ideally, this village would consist of \_\_\_\_\_ (7) cottages built around an area of grass known as a "village green". Nearby, there would be a \_\_\_\_\_ (8) with ducks on it. Nowadays such a village is not actually very \_\_\_\_\_ (9), but it is a stereotypical picture that is well-known to the British.

Perhaps this love of the countryside is another aspect of British \_\_\_\_\_ (10). The countryside represents \_\_\_\_\_ (11). Those who live in towns and cities take an active interest in country matters and the British regard it as both a right and a \_\_\_\_\_ (12) to be able to go "into the country" whenever they want to. Large areas of the country are official "\_\_\_\_\_ (13) parks" where almost no \_\_\_\_\_ (14) is allowed.

Even if they cannot get into the countryside, many British people still spend a lot of their time with "nature". They grow plants. \_\_\_\_\_ (15) is one of the most popular hobbies in the country.

**Assignment 41****A. Fill in the blanks using the following words:****Phenomena, data, species, nucleus, hypothesis, data, analysis, medium**

- Ecologists studied all the \_\_\_\_\_ that had led to the catastrophe in this region.
- The \_\_\_\_\_ was confirmed by the \_\_\_\_\_ obtained in the experiments.
- We will be ready to finish the \_\_\_\_\_ of our results after getting some additional \_\_\_\_\_.
- A lot of endangered \_\_\_\_\_ are included into the Red Book.
- The cell consists of the \_\_\_\_\_ and a mass of protoplasm.
- Most living things can't live in aggressive \_\_\_\_\_ because it destructs their vital organs.

**B. Find the meanings of the following words and expressions in a dictionary and translate them into Russian:**

establish = set up (v) realize = understand (v)  
 appoint (v) follow (v)  
 retain = receive (v) available (adj)  
 summarize (v) amount of (n)  
 prominent = outstanding (adj) opportunity (n)  
 undergraduate (n) post-graduate (n)  
 supervision (n) issue (n)  
 adviser = advisor (n) ontribution (n)

major in = specialize (v)  
 as far as sth is concerned  
 to solve a research problem  
 to take an active part in  
 share information about sth  
 to make (a great) contribution to = to contribute to  
 to have a good command of English.

### **Assignment 42**

**A. Complete the sentences below with the words from the box:**

<b>natural vegetation research</b>	<b>fatigue</b>
<b>greenhouse</b>	<b>planned</b>
<b>tirelessly</b>	<b>fundamental work</b>
<b>described</b>	<b>volumes</b>

1. It was Prof. P. Krylov who (.....) to construct the (.....) of the Botanical Garden.
2. Prof. P. Krylov considered the (.....) to be the most important problem for all Siberian botanists.
3. A person can work here (.....) all day long without feeling a (.....).
4. By 1914 the scientist had completed the first (.....) called "The Siberian Flora" which consisted of seven (.....).
5. Since 1934, Lydia Sergievskaya regularly went on expeditions around Siberia, studied and (.....) over forty-three species of the Siberian flora.

**B. Fill in the correct word(s) from the list below:**

<b>volumes</b>	<b>learn</b>
<b>multi-level system</b>	<b>besides the specialized</b>
<b>natural vegetation</b>	<b>was engaged in exploring</b>
<b>research departments</b>	<b>was transferred</b>
<b>medicine</b>	<b>all day long</b>
<b>tireless efforts</b>	

1. Tomsk University was established due to ..... and ideas of the progressively-minded people of that time.
2. Originally, Tomsk University had only one faculty – that of .....
3. In the early 2000 the Biology and Soil Studies Faculty ..... into the Institute of Biology.
4. ...., the students are taught the History of Russia, Cultural Studies, Physical Education, Russian and English.
5. As far as the English language is concerned, the Biology students ..... it in order to read understand and summarize scientific books.
6. At present, the Institute of Biology includes several .....
7. Prof. P. Krylov considered the (.....) to be the most important problem for all Siberian botanists.
8. A person can work here (.....) without getting tired.
9. By 1914 the scientist had completed the work entitled "The Siberian Flora" which consisted of seven (.....).
10. L.Sergievskaya ..... the flora of Western Siberia.
11. In the late 1990s, the transition to a ..... system of education started.

### **Assignment 43**

*Put the paragraphs of the following text in order, then read and translate the text.*

#### **Ozone Layer Depletion**

##### **Causes of ozone depletion. What is the ozone layer? The ozone hole**

№ \_\_\_\_ Ozone (O<sub>3</sub>) is a gas, and a variant of oxygen (O<sub>2</sub>). Although it is present in very small amounts in the atmosphere, significant reductions or increases in this gas can have important environmental consequences. Ozone in the Earth's stratosphere is created by ultraviolet light striking

oxygen molecules containing two oxygen atoms (O<sub>2</sub>), splitting them into individual oxygen atoms (atomic oxygen); the atomic oxygen then combines with unbroken O<sub>2</sub> to create ozone, O<sub>3</sub>.

Ozone occurring higher up in the atmosphere, between 15 and 55 km above ground level (i.e., the stratosphere) forms a protective barrier called the ozone layer, shielding the earth from extreme heat radiated by the sun. Most of the atmosphere's ozone is found in its two lowest layers: the troposphere, which extends up to 12 km above the earth's surface, and the stratosphere above it, which extends up to about 50 km. The majority of ozone is found between 20 and 50 km above the ground, with the highest ozone concentrations occurring between 20 and 25 km.

Oxygen and ozone in the stratosphere absorb ultraviolet (UV) radiation from the sun, preventing it from reaching the earth. If radiation absorption did not occur, the consequences could be fatal for humankind. Ultraviolet light of wavelengths between 280 and 320 nanometers is capable of decomposing living substances: a strong dose to human skin causes cancer, eye damage such as cataracts, immune system damage, damage to the DNA, and the small quantities that get through the ozone shield are an important cause of cancer in people. Even 1% thinning of the layer could result in an increase of thousands of skin cancer cases every year.

No \_\_\_\_ Ozone in the atmosphere is broken down when it absorbs ultraviolet radiation. This natural process can be disrupted by the presence of pollutants. Chlorine speeds up the breakdown of ozone molecules, thus leading to a depletion of the ozone layer. Chlorine is one of the constituents of CFCs. CFCs, or chlorofluorocarbons, are artificial substances and they do not occur in nature. They have been used for many years as propellants in aerosols, in the production of some foam packing for food and as coolants in refrigerators. Moreover, in the presence of UV light, CFCs dissociate, releasing chlorine atoms, which then go on to catalyze ozone destruction. It is necessary to say that CFCs have very long atmospheric lifetimes, ranging from 50 to over 100 years, so the complete recovery of the ozone layer is expected to require several lifetimes. The depletion of the ozone layer is a chain reaction and it includes the following steps:

- 1)  $\text{Cl} + \text{O}_3 \rightarrow \text{ClO} + \text{O}_2$  – The chlorine atom changes an ozone molecule to ordinary oxygen.
- 2)  $\text{ClO} + \text{O}_3 \rightarrow \text{Cl} + 2 \text{O}_2$  – The ClO from the previous reaction destroys a second ozone molecule and recreates the original chlorine atom, which can repeat the first reaction and continue to destroy ozone.

It is also established that the ozone is influenced by air pollutants which contain nitrogen. NO (nitrogen monoxide) is formed in internal combustion engines. Accordingly, the launch of rockets, missiles leads to the destruction of the ozone layer.

No \_\_\_\_ Depletion of the ozone layer could lead to the formation of the ozone hole. Ozone depletion occurs in many places in the Earth's ozone layer, most severely in the Polar Regions. Ozone hole is an area of the stratosphere in which the recent ozone levels have dropped to as low as 33%. However, the ozone hole is not usually measured in terms of ozone concentrations at these levels but by reduction in the total column ozone, above a point on the Earth's surface, which is normally expressed in Dobson units, abbreviated as "DU".

In 1974, scientists in the USA put forward their theory that CFCs could destroy ozone. In 1978, the United States, Canada and Norway enacted bans on CFC-containing aerosol sprays that are thought to damage the ozone layer. In 1982, British Antarctic Survey scientists detected a fall in ozone concentrations above the southern ice cap. By October 1984, the hole over Halley Bay had shown a 30% reduction in ozone. In 1987, 46 countries signed the Montreal Protocol on Substances that deplete the ozone layer.

#### **Assignment 44**

*Fill in the proper words from the list below:*

<b>significant</b>	<b>occurs</b>
<b>aquatic environment</b>	<b>splitting</b>
<b>combine</b>	<b>absorb</b>
<b>tension</b>	<b>delays</b>
<b>biogenesis</b>	<b>recovery</b>
<b>depletion</b>	

1. Although ozone is present in very small amounts in the atmosphere, \_\_\_\_\_ reductions or increases in this gas can cause serious problems in the environment.

2. Ozone is created by ultraviolet light striking oxygen molecules by \_\_\_\_\_ two oxygen atoms into individual oxygen atoms (atomic oxygen), which then \_\_\_\_\_ with unbroken O<sub>2</sub> to create ozone.
3. Oxygen and ozone in the stratosphere \_\_\_\_\_ ultraviolet (UV) radiation from the sun, preventing it from reaching the earth.
4. The presence of pollutants can disrupt the absorption of ultraviolet radiation that leads to a \_\_\_\_\_ of the ozone layer.
5. Chlorofluorocarbons have very long atmospheric lifetimes and the complete \_\_\_\_\_ of the ozone layer is expected to require several lifetimes.
6. Ozone depletion \_\_\_\_\_ in many places in the Earth's ozone layer, but the largest ozone holes have been registered in the Polar Regions.
7. The consequence of chemical pollution is the introduction of poisonous substances into the \_\_\_\_\_ of \_\_\_\_\_ that affect water quality.
8. Polluted water \_\_\_\_\_ the development or completely stops the process of water self-purification by the vital activity of microorganisms.
9. Detergents widely used in household and industry decrease the surface \_\_\_\_\_ of water and affect marine life.
10. For marine \_\_\_\_\_ such heavy metals as mercury, lead and cadmium are the most dangerous pollutants.

#### **Assignment 45**

*Fill in the blanks with the words and word combinations given below:*

oxygen  
 biosphere  
 energy  
 free oxygen  
 environment  
 carbon  
 hydrosphere  
 permanent inhabitants  
 mammals  
 pollinators  
 continual recycling  
 input of solar energy  
 constituents  
 biological activity  
 solar energy  
 plants  
 lithosphere  
 photosynthesis  
 nitrogen  
 atmosphere

#### **Biosphere**

The first step to understanding the interrelationship of living organisms and their non-living \_\_\_\_\_ is to begin with the sun. From it comes most of the \_\_\_\_\_ on earth. But, it is largely unavailable to animals directly. It must be transmitted to them by green vegetation through a process known as \_\_\_\_\_. In this process the \_\_\_\_\_ is transferred through a substance in the vegetation called chlorophyll (from Greek, *chloros*, green, and *phyllos*, leaf) in the presence of water to become \_\_\_\_\_ and food sugar. Now, animals can receive their energy by eating \_\_\_\_\_ or other animals (who have eaten plants at some stage). As plants and animals decay, with the help of bacteria and fungi, they release chemicals in the earth, helping to feed plants. This circulation makes the earth's basic substances – \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ – and others move between the earth's main stratum: air – \_\_\_\_\_, water – \_\_\_\_\_, soil and rocks – \_\_\_\_\_ and living organisms – \_\_\_\_\_.

The biosphere (or sphere of life), sometimes described as «the fourth envelope», is all living matter on the planet or that portion of the planet occupied by life. It reaches well into the other three spheres, although there are no \_\_\_\_\_ of the atmosphere. Relative to the volume of the Earth, the biosphere is only the very thin surface layer which extends from 11,000 meters below sea level to 15,000 meters above. The biosphere contains great quantities of elements such as carbon, nitrogen and oxygen.

Other elements, such as phosphorus, calcium, and potassium, are also essential to life, yet are present in smaller amounts. At the ecosystem and biosphere levels, there is a \_\_\_\_\_ of all these elements, which alternate between the mineral and organic states.

The functioning of the ecosystem is based on the \_\_\_\_\_. Plants and photosynthetic microorganisms convert light into chemical energy by the process of photosynthesis, which creates glucose (a simple sugar) and releases free oxygen. Glucose thus becomes the secondary energy source which drives the ecosystem. Some of this glucose is used directly by other organisms for energy. Other sugar molecules can be converted to other molecules such as amino acids. Plants use some of this sugar, concentrated in nectar to attract \_\_\_\_\_ to help them in reproduction. Cellular respiration is the process by which organisms (like \_\_\_\_\_) break the glucose back down into its \_\_\_\_\_, water and carbon dioxide, thus regaining the stored energy of the sun. Global air currents mix the atmosphere and maintain nearly the same balance of elements in areas of intense \_\_\_\_\_ and areas of slight biological activity. Water is also exchanged between the hydrosphere, lithosphere, atmosphere and biosphere in regular cycles. The oceans are large tanks, which store water, ensure thermal and climatic stability, as well as the transport of chemical elements thanks to large oceanic currents.

***Which of these statements are true or false? Correct the false sentences.***

1. The biosphere is a sphere of soils and rocks.
2. At the ecosystem and biosphere levels, there is a continual recycling of carbon, nitrogen, oxygen and other elements, such as phosphorus, calcium, and potassium.
3. The process of photosynthesis releases carbon.
4. Glucose and other sugar molecules are concentrated in nectar and attract pollinators to aid plants in reproduction.
5. Water and carbon dioxide are the two constituents which cause the process of cellular respiration.
6. Water circulates between the hydrosphere, lithosphere, atmosphere and biosphere.

#### **Assignment 46**

##### ***1. Match the definitions with these words***

1. Chemical pollution of water
  - a) defines as the content of corresponding amount of oxygen in it.
2. Pesticide
  - b) a large group of substances, which decrease the surface tension of water.
3. By-product
  - c) all living matter on the planet or that portion of the planet occupied by life.
4. Water quality
  - d) a branch of science dealing with the relations of plants and living things to each other and to their environment.
5. Biosphere
  - e) the content of harmful impurities like inorganic (mineral salts, acids, basics, clay particles) and organic substances (oil and petroleum products, organic matter, pesticides).
6. Detergents
  - f) the variety of life forms, the ecological roles they play, and the genetic diversity they contain.
7. Depletion of the ozone layer
  - g) the structural and functional unit of most living organisms.
8. Ecosystem
  - h) a system in which all the plants and living creatures in a particular area are considered together with their physical environment
9. Ecology
  - i) the natural conditions in which people, animals and plants live.
10. Biodiversity
  - j) a substance produced during the making of something else.
11. Environment
  - k) the care and management of the natural environment.
12. Process of recycling
  - l) the process of treating the material for obtaining new products from things that have been used.



13. Food chain m) a chemical substance used to kill insects which are dangerous for agricultural plants.
14. Cell n) the destruction of a layer high above the earth's surface protecting the earth from the sun's harmful rays.
15. Conservation of nature
- o) a series of living things, each of which feeds on the one below it in the series.

### **Assignment 47**

#### ***Choose the correct item:***

1. Ecology is the study of which includes all their characteristics: structure, functions, origin, evolution, classification, interrelationships, and distribution.  
a) living standards b) ecological systems c) internal structure d) external structure
2. Ecologists have made a great to world science.  
a) contribution b) amount c) distribution d) revolution
3. Biologists have saved millions of lives by discovering the of many diseases and methods of their prevention and cure.  
a) principles b) roots c) errors d) causes
4. Fungi obtain their energy from the of organic compounds.  
a) catabolism b) metabolism c) anabolism d) analysis
5. The principles of operation of the transmission electron microscope (TEM) are very to those of the compound light microscope.  
a) different b) popular c) familiar d) similar
6. Food is broken down during a process called  
a) conversion b) digestion c) combination d) generation
7. Homeostasis an organism ability to maintain constant or stable conditions that are necessary for life.  
a) refers to b) comes to c) goes to d) directs to
8. There is an enormous of life on the planet: from the microscopically small bacteria to the giant organisms.  
a) variety b) society c) vitality d) validity
9. All living things take in food from which they obtain matter for growth and energy for \_\_\_\_\_.  
a) supplement b) movement c) nourishment d) astonishment

### **Assignment 48**

#### ***A. Fill in the correct word(s) from the list below:***

*proper, carry out, lack, proteins, broad, self-contained, helpful, bring about, qualified, communication*

1. have very highly organized three-dimensional structures.
2. The post-graduates usually very serious experiments in the University chemical laboratories.
3. Although a great number of insects are harmful there are many which are to wildlife and man.
4. Microorganisms tissues.
5. Biology is such a science that no individual is an expert in all of its aspects.
6. Living things are made up of small units called cells.
7. The whole course in General Ecology attempts to an understanding of the terms "oikos" (home) and "logos" (study or science).
8. If you want to become a good and a specialist, you will have to read a lot of special literature.
9. I want to learn English in a way and I try to do it regularly.
10. The brain sometimes is called the busiest centre in the world.

#### ***B. Underline the correct word***

1. Have they completed already/yet the experiment?
2. They discussed all their problems last week/now?
3. Haven't you turned on the microwave oven still/yet.
4. All the scientific papers are being/are often referred to.
5. John said that he had been to S.-Petersburg still/before.

### **Assignment 49**

### **From the History of Biology**

The history of the biological science is of great interest. Biology is a challenging branch of science which investigates all living things.. Even in the distant past, people learnt many important things around them and passed on information about plants and animals. Prehistoric people survived by learning which plants were good to eat and which could be used for medicinal purposes. Our ancestors began to develop more reliable sources of food through primitive forms of agriculture. Some archeological evidence suggests that people living in the Near East in 6500 BC were engaged in cultivating grains, legumes, certain fruits, and other plants, such as figs, dates, pomegranates, etc. The Near Eastern Centre and other major centres of origin of cultivated plants became very important at that time. Farming would not have developed if people had not begun to realize which animals could produce food like milk and eggs.

More than 2000 years ago the Middle East people understood the role that insects and pollen played in the life cycle of plants. The ancient Egyptians studied the life cycles of insects and were particularly interested in the changes they went through as they grew from larval to adult insects. The ancient Mesopotamians even kept animals in what they thought to be the earliest zoological gardens. The ancient Greeks, too, were greatly interested in understanding the world around them. Aristotle founded the first botanical garden. When Aristotle died, he willed the botanical garden and its library to his pupil and assistant Theophrastus. Theophrastus was an extraordinary man who had written 200 treatises about plants. The most important ones which have survived are two books entitled "History of Plants" and "Causes of Plants". Thus, he made a great contribution to the study of Botany as one of the major biological sciences.

After the fall of the Roman Empire, the centre of the scientific world moved to the Middle East. It should be noted that Arabic, Persian and Turkish scientists did much to set out the foundations of the modern science of Biology. Later on, in Europe, particularly in Germany, scholars such as Albertus Magnus discussed the properties of life. He wrote seven books on plants and twenty six on animals.

Modern Biology really began in the 17th century. At that time, Antony van Leeuwenhoek (1632–1723), in Holland, invented the microscope which had a profound effect on studies in the biological sciences and led to the discovery of cells. It should be noted that the microscope allowed scientists to discover bacteria, leading to an understanding of the causes of disease, while new knowledge about how the human body works allowed others to find more effective ways of treating diseases.

All this new knowledge needed to be put into order and in the 18th century the Swedish scientist Carl Linnaeus (1707–1778) classified all living things into the biological families we know and use today. Thus, the Swedish botanist Linnaeus produced the elements to our present system of naming and classifying plants.

In the middle of the 19th century, unnoticed by anyone else, the Austrian monk Gregor Mendel (1822–1884) created his Laws of Inheritance, beginning the study of genetics that is an important part of biology today. At the same time, while travelling around the world, Ch. Darwin (1809–1882) was formulating the central principle of modern biology – natural selection as the basis of evolution. Charles Darwin's grand theory, evolution by natural selection, linked diverse biological facts into a coherent whole. The evidence for evolution is overwhelming, it is a theory about the origin of adaptation, complexity and diversity among Earth's living creatures. Evolutionary theory is such a dangerously wonderful and far reaching view of life that some people find it unacceptable, despite the vast body of supporting evidence. Ch. Darwin's theory seemed to challenge conventional religious beliefs of his time. He described himself as an agnostic. In 1859 his revolutionary book entitled "The Origin of Species" came out. Evolution is a beautiful concept, more crucial nowadays to human welfare, to medical science, and to an understanding of the world than ever before.

It is hard to believe, but the nature of viruses has become evident only within the last half of the 20th century and the first step on the path of this discovery was taken by the Russian botanist Dmitry Iwanovsky in 1892. Now we know that a virus is a noncellular particle made up of genetic material and protein that can invade living cells.

In the 20th century, biologists began to recognize how plants and animals live and pass on their genetically coded information to the next generation. The scientists James Watson and Francis Crick merged evolutionary theory with genetics. They managed to solve the molecule's double-helix structure.

Since then, because of developments in computer technology, there have been great advances in the field of modern biology; it is an area of ever-growing knowledge. We have come a long way since Charles Darwin looked for evidence making his numerous observations. The era of the genetic revolution has come!

**Read the text again and decide if the following statements are true or false:**

1. Even in the distant past, people learnt many important things around them and passed on information about treating serious diseases.  
T ☐ F ☐
2. Farming would not have developed if people had not begun to understand which animals could produce food like milk and eggs.  
T ☐ F ☐
3. K. Linnaeus founded the first botanical garden in Great Britain.  
T ☐ F ☐
4. Theophrastus was an extraordinary man, who had written 20 treatises about animals.  
T ☐ F ☐
5. Modern biology really began in the 19th century.  
T ☐ F ☐
6. The microscope allowed scientists to find more effective ways of treating diseases.  
T ☐ F ☐
7. Charles Darwin's grand theory, evolution by natural selection, was able to link diverse biological facts into a coherent whole.  
T ☐ F ☐
8. It is important to note that the nature of viruses became evident thanks to the work done by the Russian philosopher Dmitry Iwanovsky in 1888.  
T ☐ F ☐
9. The study of Biology hasn't changed all over the centuries.  
T ☐ F ☐

### **Assignment 50**

**Fill in the proper words from the list below:**

<b>treatises</b>	<b>advances</b>
<b>discover</b>	<b>share</b>
<b>merge</b>	<b>archeological evidences</b>
<b>concerned with</b>	<b>insects and pollen</b>
<b>evolution</b>	<b>noncellular</b>
<b>inheritance</b>	<b>to overlap</b>
<b>to set out</b>	<b>a microscope ... effect</b>
<b>looked for evidence</b>	

1. Some \_\_\_\_\_ suggests that people living in the Near East in 6500 BC were engaged in cultivating grains, legumes and certain fruits as well.
2. More than 2000 years ago the Middle East people understood the role that \_\_\_\_\_ played in the life cycle of plants.
3. Theophrastus was an extraordinary man who had written 200 \_\_\_\_\_ about plants.
4. Arabic, Persian and Turkish scientists did much \_\_\_\_\_ the foundations of the modern science of Biology.
5. At that time Anton van Leeuwenhoek, in Holland, invented \_\_\_\_\_ which had a profound \_\_\_\_\_ on studies of the biological sciences and led to the discovery of cells.
6. It should be noted that the microscope allowed scientists to \_\_\_\_\_ bacteria which led to an understanding of the causes of disease.
7. In the middle of the 19th century, unnoticed by anyone else, the Austrian monk Gregor Mendel created the Laws of \_\_\_\_\_.
8. Charles Darwin's grand theory, \_\_\_\_\_ by natural selection, linked diverse biological facts into a coherent whole.
9. Now we know that a virus is a \_\_\_\_\_ particle made up of genetic material and protein that can invade living cells.
10. The scientists James Watson and Francis Crick managed to \_\_\_\_\_ evolutionary theory with genetics.
11. Since then, because of developments in computer technology, there have been great \_\_\_\_\_ in the field of modern Biology.

12. Genetics is the branch of biology \_\_\_\_\_ the study of heredity and variation.  
 13. All organisms, from bacteria to animal, \_\_\_\_\_ the same basic machinery that copies and translates DNA into proteins.  
 14. We have come a long way since Charles Darwin \_\_\_\_\_ making his numerous observations.

**Критерии оценки практического задания (каждый пункт 2 балла)**

<b>Вид работы</b>	<b>Шкала оценивания</b>
Практическое задание	<b>6 баллов</b> , если задание выполнено полностью, даны ответы на все вопросы, не допущено ни одной ошибки
	<b>4 балла</b> , если задание выполнено полностью, даны не полные ответы на все вопросы, допущены незначительные ошибки
	<b>2 балла</b> , если задание выполнено частично, допущены серьёзные ошибки при формулировке ответов на поставленные вопросы
	<b>0 баллов</b> , если задание не выполнено

**Тематика для написания сообщения по дисциплине «Иностранный язык»**

1. Развитие биоэкологии в России.
2. Развитие биоэкологии за рубежом.
3. Биоэкологические науки в образовании.
4. Магистерские программы в области биоэкологии в университетах Британии.
5. Магистерские программы в области биоэкологии в университетах США.
6. Магистерские программы в области биоэкологии в Европейских странах.
7. Современные биоэкологические теории.
8. Современные биоэкологические направления.
9. Новейшие открытия в области биоэкологии: отечественный опыт.
10. Новейшие открытия в области биоэкологии: зарубежный опыт.
11. Особенности деятельности биоэколога.
12. Особенности профессионально-деловой коммуникации.
13. Формы межкультурного профессионального общения.
14. Устойчивые обороты научной речи: англо-русские соответствия.
15. Особенности общения в условиях международной научной конференции.
16. Коммуникативные стили и межкультурные различия.
17. Виртуальные конференции.
18. Язык профессионально-делового общения как функционально-стилистическая разновидность английского языка.
19. Идиоматика профессионально-делового языка.
20. Новейшие достижения в области профессионального образования.
21. Терминологический аппарат педагогических теорий: русско-английские соответствия.
22. Лексико-морфологические особенности профессионально-делового языка.
23. Характерные черты академического стиля.
24. Официальный стиль и книжная лексика английского языка.
25. Оформление эссе или академических письменных работ.
26. Использование ссылок и цитат в академических работах.
27. Виды академических текстов.
28. Стратегии чтения академических текстов.
29. Микронавыки, необходимые для функционирования в англоязычной академической среде.
30. Макронавыки, необходимые для функционирования в англоязычной академической среде.
31. Подготовка резюме на иностранном языке.

32. Привила написания автобиографии.
33. Организация мероприятий.
34. Основные формы устного делового общения (деловая беседа, телефонные переговоры, совещание, деловая дискуссия, пресс-конференция, переговоры, публичное выступление).
35. Правила прохождения собеседования.

### Критерии оценки сообщения

Вид работы	Шкала оценивания
Сообщение	<b>20 баллов</b> , если представленное сообщение свидетельствует о проведенном самостоятельном исследовании с привлечением различных источников информации; логично, связно и полно раскрывается тема; заключение содержит логично вытекающие из содержания выводы.
	<b>15 баллов</b> , если представленное сообщение свидетельствует о проведенном самостоятельном исследовании с привлечением двух-трех источников информации; логично, связно и полно раскрывается тема; заключение содержит логично вытекающие из содержания выводы.
	<b>10 баллов</b> , если представленное сообщение свидетельствует о проведенном исследовании с привлечением одного источника информации; тема раскрыта не полностью; отсутствуют выводы.
	<b>0 баллов</b> , если сообщение отсутствует

### Вопросы для экзамена

1. Понятие профессиограммы.
2. Система высшего образования в России.
3. Система высшего образования в Британии и США.
4. Система высшего образования в Европейских странах.
5. Магистратура в Британии и США.
6. Магистратура в России.
7. Обучение в магистратуре в различных университетах мира.
8. Магистерские направления и курсы.
9. Исследовательские программы магистратуры.
10. Обучающие программы магистратуры.
11. Биоэкологические науки в образовательном пространстве
12. Уровни образования, дипломы и ученые степени в англо-русских соответствиях.
13. Научное исследование магистранта: проблема, цель, задачи, методы исследования, результаты.
14. Перспективы развития биоэкологии.
15. Профессиональное образование в образовательном пространстве.
16. Научная деятельность.
17. Терминологический аппарат педагогических теорий: русско-английские соответствия.
18. Язык профессионально-делового общения как функционально-стилистическая разновидность английского языка.
19. Лексико-морфологические особенности профессионально-делового языка.
20. Идиоматика профессионально-делового языка.
21. Виды делового общения.
22. Жанры научной речи.
23. Особенности профессионально-деловой коммуникации.
24. Устная коммуникация.

25. Письменная коммуникация.
26. Особенности межкультурного профессионального общения.
27. Формы межкультурного профессионального общения.
28. Международные конференции по биоэкологии.
29. Межкультурные различия вербального и невербального поведения.
30. Лексико-морфологические особенности профессионально-делового языка.
31. Идиоматика профессионально-делового языка.
32. Формальный/неформальный регистры речи.
33. Понятие коммуникативного стиля.
34. Виды коммуникативных стилей.
35. Научная презентация.

#### *Тематика сообщений для выступления на экзамене*

1. Ученая степень бакалавра в Европе XII-XIII веков.
2. Ученая степень магистра в Европе XII-XIII веков.
3. Ученая степень доктора в Европе XII-XIII веков.
4. Иерархическая система степеней «магистр» – «доктор» в XV–XVII веках.
5. Проблема унификации ученых степеней и званий.
6. «Всеобщая хартия университетов» (1988 г.).
7. Конвенция о признании квалификаций, относящихся к высшему образованию в Европейском регионе (1997 г.).
8. Совместная Декларация о гармонизации структуры системы европейского высшего образования (1998 г.).
9. Декларации об архитектуре высшего европейского образования (Болонская декларация, 1999 г.).
10. Интерактивная технология и ее использование при обучении биоэкологии.
11. Проектная технология и ее использование при обучении биоэкологии.
12. Блочная-модульная технология и ее использование при обучении биоэкологии.
13. Метод кейсов при обучении биоэкологии.
14. Проблемная технология и ее использование при обучении биоэкологии.
15. Дебаты-технология и ее использование при обучении биоэкологии.
16. Понятийно-терминологический аппарат педагогических технологий.
17. Эволюция научных знаний в педагогике в России.
18. Эволюция научных знаний в зарубежной педагогике.
19. Объективные и субъективные трудности в разработке терминов и понятий в определенной области научного исследования.
20. Идиоматика профессионально-делового языка в сфере биоэкологии.
21. Система регистров речи.
22. Факторы регуляции речевого общения.
23. Формальный регистр речи.
24. Неформальный регистр речи.
25. Формы межкультурной профессиональной коммуникации.
26. Видов межкультурной профессиональной коммуникации.
27. Типы межкультурной профессиональной коммуникации.
28. Блоги и форумы в области биоэкологии в России.
29. Блоги и форумы в области биоэкологии за рубежом.
30. Научные дебаты в области биоэкологии, организуемые в России.
31. Научные дебаты в области биоэкологии, организуемые за рубежом.
32. Инструменты для создания эффективной презентации.

33. История создания Европейского языкового портфеля.
34. Американский портфель учащегося:
35. Европейский языковой портфель в России.

#### **Экзамен 1 семестр:**

Экзамен по дисциплине «Иностранный язык» состоит из двух частей:

- 1) ответ по подготовленному сообщению;
- 2) ответ на предложенный вопрос.

**Методические материалы, определяющие процедуры оценивания знаний, умений, навыков и (или) опыта деятельности, характеризующих этапы формирования компетенций.**

Дисциплина «Иностранный язык» занимает важное место в профессиональной подготовке высококвалифицированного педагога в определенной профессиональной области и является обязательной для изучения.

Практические занятия по дисциплине «Иностранный язык» должны пробудить интерес студентов к изучению особенностей речевой коммуникации в условиях межкультурного профессионального общения, развить умение анализировать новейшие достижения в области профессиональной деятельности с оценкой их значимости, создавать собственные образцы речи на английском языке по профессиональной тематике.

Сообщение как форма текущего контроля предполагает 10-15-минутное выступление магистранта на практическом занятии на заранее подготовленную тему. Сообщение направлено на формирование навыка изложения своих мыслей в устной форме. При оценивании сообщения учитывается умение выделить актуальные научные работы по выбранной теме; проанализировать изученный материал с выделением наиболее значимых с точки зрения раскрытия темы сообщения, фактов, мнений и научных положений; логически выстроить материал сообщения.

Выполнение практических заданий направлено на углубление, совершенствование профессиональных знаний и навыков учащихся, которые должны овладеть различными методами решения практических задач в художественном образовании. Критерием оценки практических заданий является: соответствие содержания работы заявленной теме; глубина, полнота раскрытия темы; уровень навыков самостоятельной работы с научной литературой.

Максимальное количество баллов, которое может набрать магистрант в течение семестра за текущий контроль, равняется 70 баллам.

Минимальное количество баллов, которые магистрант должен набрать в течение семестра за текущий контроль равняется 30 баллам.

Максимальная сумма баллов, которые магистрант может получить на экзамене равняется 30 баллам.

Формой промежуточной аттестации является экзамен. Экзамен проводится в виде устного собеседования по вопросам и выступления по подготовленному сообщению.

#### **Критерии оценивания промежуточной аттестации (экзамен)**

##### **«30-22»**

- 1) Полное усвоение материала;
- 2) Умение выделить главное, сделать обобщающие выводы;
- 3) Исчерпывающее, грамотное и ясное изложение материала;
- 4) Свободное владение основными понятиями;
- 5) Полные ответы на дополнительные вопросы;

##### **«21-11»**

- 1) Достаточно полное усвоение материала;
- 2) Умение выделять главное, делать выводы;
- 3) Грамотное изложение материала, отсутствие неточностей;
- 4) Знание основных понятий;

5) Ответы на дополнительные вопросы;

**«10-1»**

- 1) Общее знание основного материала;
- 2) Неточная формулировка основных понятий;
- 3) Умение применить свои знания на практике с допущением ошибок;
- 4) Знание некоторых понятий;
- 5) Затруднения при ответе на дополнительные вопросы;

**«0»**

- 1) Незнание значительной части материала;
- 2) Существенные ошибки при ответе на вопрос;
- 3) Незнание основных понятий;
- 4) Грубые ошибки при попытке применить знания на практике;
- 5) Неспособность ответить на дополнительные вопросы.

**Итоговая шкала оценивания результатов освоения дисциплины**

Итоговая оценка по дисциплине формируется из суммы баллов по результатам текущего контроля и промежуточной аттестации и выставляется в соответствии с приведенной ниже таблицей:

Оценка по 100-балльной системе	Оценка по традиционной шкале
81-100	отлично
61-80	хорошо
41-60	удовлетворительно
0-40	не удовлетворительно