Филиал федерального государственного бюджетного образовательного учреждения высшего образования «Астраханский государственный технический университет» в Ташкентской области Республики Узбекистан

Факультет высшего образования

Кафедра «СГиОПД»

Иностранный язык в профессиональной деятельности

Методические указания

для практического освоения дисциплины
для магистров направления
05.04.06 Экология и природопользование
Направленность Экологический мониторинг

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Составитель:
ассистент, Шаюсупова Н.Б.

Рецензент:
к.б.н, доцент, Обухова О.В.

Методические указания для практических занятий по дисциплине «Иностранный язык в профессиональной деятельности» для магистров направления 05.04.06 «Экология и природопользование» (направленность «Экологический мониторинг»)

Методические указания для практических занятий предназначены для магистров направления 05.04.06 «Экология и природопользование» (направленность «Экологический мониторинг»)

Целью методических указаний является формирование и развитие иноязычных навыков говорения, чтения, письма, понимания устных и письменных речевых сообщений, что обеспечит необходимый уровень сформированности компетенции УК-4.

Методические указания содержат аутентичные текстовые материалы, комплекс упражнений различной направленности, ссылки на учебно-методическую литературу и Интернет-ресурсы по темам рабочей программы дисциплины «Иностранный язык в профессиональной деятельности».

Методические указания для практических занятий по дисциплине «Иностранный язык в профессиональной деятельности» утверждены на заседании кафедры «СГиОПД» Протокол от 21.02.2025 г. № 7

Содержание

1. ВВЕДЕНИЕ.……. 4

2. Темы рабочей программы и задания для практической работы……. . 5

2.1. Тема 1. «Послевузовское образование в стране(ах) изучаемого языка и в России. Магистратура в АГТУ. Личностное развитие» …… 5

2.2. Тема 2. «Наука и научный метод. Естественные науки. Традиционные и современные методы исследования в естественных науках» …… 7

2.3. Тема 3. «Биология- наука о жизни. Объекты биологии. Морские биологи» …….. 14

2.4. Тема 4. «Экология и ее объекты. Изучение дикой природы. Морские и речные экосистемы» ……. 13

2.5. Тема 5. «Проблемы охраны окружающей среды. Новые технологии рационального использования биологических ресурсов» …… 18

2.6. Тема 6. «Информационные технологии в учебной, научной и профессиональной деятельности» …….. 21

2.7. Тема 7. «Моя научная работа. Объект и предмет магистерской диссертации» …… 24

СПИСОК ИНФОРМАЦИОННЫХ ИСТОЧНИКОВ……. 28

1. Введение

Методические рекомендации по выполнению практической работы по дисциплине «Иностранный язык в профессиональной деятельности» включают тексты и задания, соответствующие содержанию рабочей программы дисциплины.

Содержательная часть включает следующие темы: «Послевузовское образование в стране(ах) изучаемого языка и в России. Магистратура в филиале АГТУ. Личностное развитие», «Наука и научный метод. Естественные науки. Традиционные и современные методы исследования в естественных науках», «Биология- наука о жизни. Объекты биологии. Морские биологи», «Экология и ее объекты. Изучение дикой природы. Морские и речные экосистемы», «Проблемы охраны окружающей среды. Новые технологии рационального использования биологических ресурсов», «Информационные технологии в учебной, научной и профессиональной деятельности», «Моя научная работа. Объект и предмет магистерской диссертации».

Настоящие методические указания позволят обучающимся овладеть фундаментальными знаниями, профессиональными умениями и навыками деятельности и направлены на формирование следующей компетенций:

УК-4– способен применять современные коммуникативные технологии, в том числе на иностранном(ых) языке(ах), для академического и профессионального взаимодействия.

В результате выполнения практических работ по дисциплине «Иностранный язык в профессиональной сфере» обучающиеся должны:

- знать правила и закономерности личной и деловой устной и письменной коммуникации;
- современные коммуникативные технологии на русском и иностранном языках; существующие профессиональные сообщества для профессионального взаимодействия;
- уметь применять на практике коммуникативные технологии, методы и способы делового общения для академического и профессионального взаимодействия;
- владеть методикой межличностного делового общения на русском и иностранном языках, с применением профессиональных языковых форм, средств и современных коммуникативных технологий.

Описание практической работы содержит: название изучаемой темы, текст и задания по тексту и/или теме. Для получения дополнительной, более подробной информации по изучаемым вопросам приведены рекомендуемые источники.

2. Темы рабочей программы и задания для практической работы

2.1. Тема 1. «Послевузовское образование в стране(ах) изучаемого языка и России. Магистратура в АГТУ. Личностное развитие».

Exercise 1. Read the text and get ready to answer the following questions.

1. What is the main reason for considering postgraduate education?
2. How many types of Master's degree programmes do the universities offer?
3. Which type of Master's degree may be considered an initial step to PhD. Why?
4. What requirements should an individual meet to be registered for the PhD programmme?
5. Are there any additional requirements for international students?
6. Who helps a student in undertaking the doctorate research?
7. Which universities are the best ones to undertake the postgraduate work?

POSTGRADUATE EDUCATION

Those who have already earned the first academic degree (i.e. a Bachelor's degree), are keenly interested in a certain subject and want to know more about it should consider postgraduate study. Further study is useful, both for its own sake and because a postgraduate qualification may lead to better prospects of employment. You can choose one field of learning, or conduct interdisciplinary research. You can take full-time or part-time course. Higher degrees (or further degrees) are of two types: *master* and *doctor*. The style of postgraduate work differs for those who are involved: for some this will include taught programmes, for others the primary focus will be on research.

The taught Master's degree in the UK may be called a Master of Arts (MA) in England and Wales, or Master of Letters (MLitt) in Scotland. It is an advanced examination degree, awarded after a year's post-graduate study and some research (12 months), and is viewed as an additional qualification for a profession, for example, teaching. The US degree of this kind follows the same structure of classroom work and research but takes two years to earn. This is because in the UK the taught Master's degree is more focused on the chosen subject from the very beginning, while the USA liberal arts education requires each student to learn a broader curriculum.

The research-based Master's degree can be called different names both in the UK and the USA, including Master of Science (MSc) Master of Science by Research (MRes), and Masters of Philosophy (MPhil). It is normally awarded on acceptance of a thesis (dissertation) based on a short period of research a student undertakes (a research project) rather than classes a student attends. This degree may be considered as an introduction to "real research", that is, work on a *doctoral thesis*, because a part of Master's work is often credited toward the PhD and may serve as a basis for the PhD research area. Many students often begin research-based type of programme and then transfer into a PhD.

Speaking about Doctorates or PhDs (as well as about MPhil), one should keep in mind that the use of the word *philosophy* does not mean that the degree is restricted to philosophy. One may have a PhD (Doctor of Philosophy, Ph.D.) in mathematics, or geography, or economics (e.g. PhD in Economics). This degree is awarded after the successful completion of a programme of research. A post-graduate should submit a thesis which must be an original contribution to knowledge. Research for this degree usually takes about three years, although the length of time needed varies considerably according to the subject.

In order to be accepted for a PhD programme, one must typically submit a research proposal and have a strong academic background along with some research experience in the relevant subject. In addition to the general admission requirements, international applicants must submit a transcript of university courses and grades, translated into English. They also need to show that they have an adequate knowledge of spoken and written English, i.e. show the results of any international English language test: IELTS, TOEFL, etc.

Academic degrees are taught through the mixture of lectures, seminars, workshops and tutorials. A vital part of all postgraduate programmes is the learning of relevant research methods. Postgraduate research students also undertake certain amount of teaching undergraduate programmes in order to broaden their academic experience. The research project of a postgraduate is guided by a dissertation supervisor (an advisor) in the UK, or a PhD committee in the USA. A supervisor is not the same as a personal tutor. A tutor looks after the student's general academic welfare from the beginning of the programme. A supervisor starts working with a post-graduate student as soon as his or her dissertation topic is chosen. The working relationship of post-graduates with their supervisors as a rule includes the correct degree of guidance and support to enable the research students to gain the most from their studies.

It should be mentioned that there is another type of doctorate, which is sometimes called *a senior doctorate* (Doctor of Letters or Doctor of Science). Though this degree is much higher than the PhD, it does not involve the writing of a thesis (dissertation). A person applying for such a degree submits his published works to a committee, who then decide whether this work justifies the award of the degree.

The best places in which to undertake your postgraduate work are the leading research universities in the UK or the USA with a well-established reputation, a wide range of interest and facilities both for academic work and for social life. Most importantly, they have researchers and scholars of international distinction, and the standard of teaching is very high. Such universities also enjoy close links with industry and commerce, which results in many benefits including the involvement of industrialists and businesses in planning of research and teaching to ensure its relevance to modern-day issues.

Exercise 2. Give Russian equivalents of the following words and word combinations:

to award an academic degree; a supervisor, scholars of international distinction; a research method; employment, social life; a language test; classroom work; submit a research proposal; benefits, dissertation topic.

Exercise 3. Give English equivalents of the following words and word combinations:

послевузовское образование; получать ученую степень; вести преподавательскую работу; очное обучение; уровень преподавания; диссертация (2), вклад в науку; куратор, современные проблемы/вопросы; практические занятия; междисциплинарные исследования; представить опубликованные работы комиссии.

Exercise 4. Change words in brackets for their English equivalents. Read the text and answer the question: ***What do Oxford and Cambridge have in common*****?**

There are some 90 (университеты) in Britain. They appoint their own (штаты/персонал), decide which (студенты) to admit, provide their own (курсы) and (присуждать) their own degrees.

Many universities have close links with commerce and industry. (Ученая степень) titles vary according to the practice of each university. In England, Wales and Northern Ireland the most common titles for a first degree are Bachelor of Arts (BA) or Bachelor of Science (BSc) and for a second degree Master of Arts (MA), Master of Science (MSc). Doctor of Philosophy (PhD) is used for the third degree. British degrees are taught through (лекции, семинары) and tutorials. There are combined (or joint honours) (программы) which enable students to study a combination of subjects.

Oxford and Cambridge are the UK's most famous universities. They are also different to other institutions in a number of key ways. Oxford and Cambridge universities consist of a number of (колледжи), **e**ach having its own name and its coats of arms. On the territory there is usually a chapel, a dining hall, a (библиотека), rooms for undergraduates, and also rooms for teaching. Most colleges are made of grey stone. They have stood there for many centuries. Sport is a part of students (жизнь) at both universities. There is a great rivalry between the universities and they play all sorts of games between each other like cricket, punting and rowing, which are the most popular sports.

Exercise 5. Translate into English.

1. Тем, кто хочет получить хорошую работу, следует подумать о послевузовском образовании.
2. Студент может сосредоточиться только на выбранном предмете или заниматься по расширенной программе.
3. Послевузовские программы исследовательского характера включают изучение современных методов исследования.
4. Ученая степень доктора философии в какой-либо области науки присуждается по завершении исследований и представлении диссертации комиссии.
5. Многие университеты имеют тесные связи с представителями промышленности и бизнеса, что обеспечивает актуальность обучения и тематики исследовательских проектов в послевузовском образовании.

Exercise 6. Speak on the Master's course you are taking in ASTU. How getting the Master's degree can change your life?

2.2. Тема 2. «Наука и научный метод. Естественные науки. Традиционные и современные методы исследования в естественных науках»

Exercise 1. Read the text "Scientific methods" and understand it. Which sentences best express the essential information of the text?

SCIENCE AND THE SCIENTIFIC METHOD

If we knew what it was we were doing, it would not be called research, would it?

--- *Albert Einstein*

Science and non-science can be distinguished by the kinds of laws and rules that are constructed to unify the body of knowledge. Science involves the continuous testing of rules and principles by the collection of new facts. In science, these rules are usually arrived at by using the scientific method—observation, questioning, exploring resources, hypothesis formation, and the testing of hypotheses.

Scientific inquiry often begins with an observation that an event has occurred repeatedly. An **observation** occurs when we use our senses (smell, sight, hearing, taste, touch) or an extension of our senses (microscope, tape recorder, X-ray machine, thermometer) to record an event. The information gained by direct observation of the event is called **empirical evidence** (empiric = based on experience; from the Greek empirikos = experience). Empirical evidence is capable of being verified or disproved by further observation. If the event occurs only once or cannot be repeated in an artificial situation, it is impossible to use the scientific method to gain further information about the event and explain it.

As scientists gain more empirical evidence about an event they begin to develop questions about it. A question that is too broad or too complex may be impossible to answer; therefore a great deal of effort is put into asking the question in the right way. Once a decision has been made about what question to ask, scientists explore other sources of knowledge to gain more information. After exploring the appropriate literature, a decision is made about whether to continue to explore the question. If the scientist is still intrigued by the question, a formal hypothesis is constructed and the process of inquiry continues at a different level.

A **hypothesis** is a statement that provides a possible answer to a question or an explanation for an observation that can be tested. A hypothesis is based on observations and information gained from other knowledgeable sources and predicts how an event will occur under specific circumstances. Scientists test the predictive ability of a hypothesis to see if the hypothesis is supported or is disproved. If you disprove the hypothesis, it is rejected and a new hypothesis must be constructed.

The test of a hypothesis can take several forms. It may simply involve the collection of pertinent information that already exists from a variety of sources. In other cases a hypothesis may be tested by simply making additional observations. Another common method for testing a hypothesis involves devising an experiment. An **experiment** is a recreation of an event or occurrence in a way that enables a scientist to support or disprove a hypothesis. This can be difficult because a particular event may involve a great many separate happenings called **variables.** To help unclutter such situations, scientists use what is known as a controlled experiment.

A **controlled experiment** allows scientists to construct a situation so that only one variable is present. Furthermore, the variable can be manipulated or changed. A typical controlled experiment includes two groups; one in which the variable is manipulated in a particular way and another in which there is no manipulation. The situation in which there is no manipulation of the variable is called the **control group;** the other situation is called the **experimental group.** In an experiment there should only be one independent variable and the dependent variable is expected to change as a direct result of manipulation of the independent variable. After the experiment, the new data (facts) gathered would be analyzed.

Scientists are not likely to accept the results of a single experiment because it is possible a random event that had nothing to do with the experiment could have affected the results and caused people to think there was a cause-and-effect relationship when none existed. Furthermore, scientists often apply statistical tests to the results to help decide in an impartial manner if the results obtained are **valid** (meaningful, fit with other knowledge) and **reliable** (give the same results repeatedly) and show cause and effect, or if they are just the result of random events. During experimentation, scientists learn new information and formulate new questions that can lead to even more experiments. One good experiment can result in 100 new questions and experiments. When general patterns are recognized, theories and laws are formulated.

Theories and hypotheses are different. A hypothesis provides a possible explanation for a specific question; a theory is a broad concept that shapes how scientists look at the world and how they frame their hypotheses. A **scientific law** is a uniform or constant fact of nature that describes what happens in nature. While laws describe what happens and theories describe why things happen, in one way laws and theories are similar. Often as observations are made and hypotheses are tested, a pattern emerges which leads to a general conclusion, principle, or theory. This process of developing general principles from the examination of many sets of specific facts is called **induction** or **inductive reasoning.** Once a rule, principle, or theory is established, it can be used to predict additional observations in nature. When

general principles are used to predict the specific facts of a situation, the process is called **deduction** or **deductive reasoning.**

If a rule is not testable, or if no rule is used, it is not science. **Pseudoscience** (pseudo = false) is not science but uses the appearance or language of science to convince, confuse, or mislead people into thinking that something has scientific validity. When pseudoscientific claims are closely examined, it is found that they are not supportable as valid or reliable.

The scientific method can be applied only to questions that have factual bases. Questions concerning morals, value judgments, social issues, and attitudes cannot be answered using the scientific method. Science is also limited by the ability of people to pry understanding from the natural world. People are fallible and do not always come to the right conclusions because information is lacking or misinterpreted, but science is self-correcting. As new information is gathered, old incorrect ways of thinking must be changed or discarded.

Exercise 2. Match the words with the definitions.

1. control group	**a**. any factor, trait or condition that can be controlled, changed, or measured in an experiment
2. deductive reasoning	**b.**a logical process in which a conclusion for a specific case is based on general premises (top-down logic)
3.empirical evidence	**c**. the group that receives the variable being tested and compared to a control group
4. experiment	**d**. a logical process in which a general conclusion is based on specific examples (bottom-up logic)
5.experimental group	**e.**any group which does not receive the variable being tested and used as the standard to which comparisons are made in an experiment
6. hypothesis	**f**. information acquired by observation or experimentation
7. inductive reasoning	**g**. a statement based on repeated experimental observations or a verified description of an observed phenomenon
8. reliable	**h**. based on truth or sensible reasoning
9. scientific law	**i**. a scientific test carried out to make a discovery, support, refute or validate a hypothesis, demonstrate a known fact
10. valid	**j**. suitable or fit to be trusted or relied on
11. variable	**k**. an assumption based on known facts then tested through study or experimentation

Exercise 3. Give Russian equivalents to the following words and expressions:

scientific method, scientific inquiry, X-ray machine, to record an event, artificial situation, develop questions, explore sources of knowledge, formal hypothesis, under specific circumstances, recreation of an event, support or disprove a hypothesis, unclutter situations, independent variable, dependent variable, cause-and-effect relationship, general conclusion, convince, confuse, mislead, scientific validity, pseudoscientific claims, factual bases, value judgments, fallible, must be discarded.

Exercise 4. Give English equivalents to the following words and expressions:

объём знаний, апробирование правил и принципов, наблюдение, подвержение сомнению, изучение материала, формирование гипотезы, проверка гипотезы, проверенный, опровергнутый, процесс исследования, источники знания, прогностичность гипотезы, существенная информация, планирование эксперимента, отдельные проявления, случайное событие, беспристрастно, демонстрировать причинно-следственную связь, общие закономерности, достоверные и надежные, извлекать с трудом, людям свойственно ошибаться.

Exercise 5. Now read the text again and decide whether these sentences are true or false.

1. Non-science is a discipline involving asking questions, making observations and devising theories.
2. Science is a way of thinking, questioning, and gathering evidence.
3. The scientific method is the method of research used by the various sciences.
4. Apart from using our senses to study the world, observation may involve other tools like computers or scan electron microscopes.
5. A hypothesis is a proposed answer for a scientific question.
6. Hypotheses often cause scientists to develop new experiments that produce additional data.
7. For scientist, just one test of a hypothesis is usually enough.
8. When data support a hypothesis, it is rejected.
9. Testing, revising, and occasionally rejecting new and old theories never ends.
10. Rejected data are not useful because they do not lead to new hypothesis.
11. Scientific experiments allow scientists to test hypotheses and find out how something happens.
12. A theory does not explain a wide range of observations.
13. A theory is a proposed explanation for observations and experimental results that is supported by evidence.

Exercise 6. Comprehension. Answer the following questions.

1. What are the main scientific methods?
2. What is observation?
3. What type of information can be called empirical evidence?
4. How can a hypothesis be defined? What role do hypotheses play in scientific inquiry?
5. What is the most common method for testing a hypothesis?
6. What is called a controlled experiment?
7. What is the difference between the control group and the experimental group?
8. What is the difference between an independent variable and a dependent variable?
9. How do experiments show cause-and-effect relationships?
10. What is the difference between a scientific law and a theory?
11. How are hypotheses and theories related?
12. How do inductive and deductive reasoning differ?
13. What questions cannot be answered using the scientific method?

2.3. Тема 3. «Биология- наука о жизни. Объекты биологии. Морские биологи»

Exercise 1. Do the following tasks:

A. You are going to read four paragraphs. Choose the best heading for each of the following paragraphs from the list below (A-F). There is one extra heading.

B. Translate the paragraphs. Determine and put the main ideas of each paragraph into your own words.

A Why study biological sciences?
B Basic principles of biology
C The study of life
D Characteristics of life
E Subdisciplines of biology
F Living things

1. As biological sciences, or life sciences, encompass a broad range of subjects, from molecular biology to ecology, biochemistry, biophysics, genetics and physiology, the study of nature has often inspired scientists and inventors to come up with new ideas for improving people's lives. Biology has assisted in the development of techniques in emerging fields such as biotechnology, biomedical sciences, and neuroscience.

2. The field of biology is very broad in scope and can be divided into several disciplines. In the most general sense, these disciplines are categorized based on the type of organism studied. For example, zoology deals with animal studies, botany deals with plant studies, and microbiology is the study of microorganisms. These fields of study can be broken down further into several specialized sub-disciplines. Some of which include anatomy, cell biology, genetics, and physiology.

3. Living things include both the visible world of animals and plants, as well as the invisible world of **bacteria**. On a basic level, we can say that life is ordered. Organisms have an enormously complex organization. We're all familiar with the intricate systems of the basic unit of life, the **cell**. Life can also "work." Living creatures can take in energy from the environment. This energy, in the form of food, is transformed to maintain **metabolic processes** and for survival. Life grows and develops. This means more than just getting larger in size. Living organisms also have the ability to rebuild and repair themselves when injured. Life can **reproduce**. Have you ever seen dirt reproduce? I don't think so. Life can only come from other living creatures. Life can respond. Life is characterized by responses to stimuli. Finally, life can adapt and respond to the demands placed on it by the environment. There are three basic types of adaptations that can occur in higher organisms: reversible changes, somatic changes and mutation (genotypic adaptation).In summary, life is organized, "works," grows, reproduces, responds to stimuli and adapts. These characteristics form the basis of the study of biology.

4. What is biology? Simply put, it is the study of life -- life in all of its grandeur. From the very small algae to the very large elephant, life has a certain wonder about it. With that in mind, how do we know if something is living? Is a virus alive or dead? What are the characteristics of life? These are all very important questions with equally important answers. So, biology is the study of living things and their vital processes – playing a crucial role in our everyday existence.

5.The foundation of biology as it exists today is based on five basic principles. They are the cell theory, gene theory, evolution, homeostasis, and laws of thermodynamics. Cell Theory: all living organisms are composed of cells. The cell is the basic unit of life. Gene Theory: traits are inherited through gene transmission. Genes are located on chromosomes and consist of DNA. Evolution: any genetic change in a population that is inherited over several generations. These changes may be small or large, noticeable or not so noticeable. Homeostasis: ability to maintain a constant internal environment in response to environmental changes. Thermodynamics: energy is constant and energy transformation is not completely efficient.

Exercise 2. Translate from English into Russian.

1. Biology is a natural science concerned with the study of life and living organisms, including their structure, function, growth, evolution, distribution, and taxonomy.

2. Reversible changes occur as a response to changes in the environment. Let's say you live near sea level and you travel to a mountainous area. You may begin to experience difficulty breathing and an

increase in heart rate as a result of the change in altitude. These symptoms go away when you go back down to sea level.

3. Somatic changes occur as a result of prolonged changes in the environment. Using the previous example, if you were to stay in the mountainous area for a long time, you would notice that your heart rate would begin to slow down and you would begin to breathe normally. Somatic changes are also reversible.

4. The final type of adaptation is called genotypic (caused by mutation). These changes take place within the genetic makeup of the organism and are not reversible. An example would be the development of resistance to pesticides by insects and spiders.

Exercise 3. Translate from Russian into English.

1. Биология как наука является широкой и сложной, но некоторые общие темы помогают организовать эту сложность. Клетки являются основной единицей жизни. Они являются машинами для обработки информации. Структуры молекул, макромолекулярные комплексы и даже более высокие уровни организации связаны с их функциями. Разнообразие жизни можно классифицировать и систематизировать на основе сходных особенностей, а сохранение видов указывает на важные функции. Организация живых систем приводит к появлению новых свойств, которые в настоящее время невозможно предсказать.

2. Биология - это объединяющая наука, которая для изучения живых систем использует знания, полученные от других естественных наук. Простого определения жизни нет, но в основе живых систем лежит ряд свойств, которые в совокупности описывают жизнь. Живые системы также организованы иерархически, с новыми появляющимися свойствами, которые могут быть больше, чем сумма частей.

Exercise 4. Complete the text with the words and expressions given above. Translate the text.

Study of chemistry, information, multidisciplinary approach, natural laws, natural science, energy source, energy transactions, chemical systems, living systems, put another way, forms of matter, modern scientists, expertise.

Biology unifies much of 1) _____. The study of biology does much to unify the 2) _____ gained from all of the natural sciences. Biological systems are the most complex 3) _____ that we know of on Earth, and their many functions are both determined and constrained by the principles of chemistry and physics. 4) _____, there are no new laws of nature to be gleaned from the study of biology - but that study does illuminate and illustrate the workings of those 5) _____.

The intricate chemical workings of cells are based on all that we have learned from the 6) _____, and every level of biological organization is governed by the nature of 7) _____ learned from the study of thermodynamics. Biological systems do not represent any new 8) _____, and yet they are the most complex organization of matter known. The complexity of 9) _____ is made possible by a constant source of energy: the Sun. The conversion of this 10) _____ into organic molecules by photosynthesis can be understood using the principles of chemistry and physics.

As 11) _____ take on more difficult problems, the nature of how we do science is changing as well. Science is becoming more interdisciplinary, combining the 12) _____ of a variety of scientists in exciting new fields such as nanotechnology. Biology is at the heart of this 13) _____ because biological problems often require many different approaches to arrive at solutions.

Exercise 5.Translate the words and expressions given in Russian into English. Entitle the text.

In its broadest sense, ***биология*** is the study of living things – ***наука о жизни***. Living things come in an astounding ***разнообразие*** of shapes and forms, and ***биологи*** study life in many ***разные способы***. ***Они живут*** with gorillas, collect ***окаменелости***, and listen to ***киты***. They read the messages encoded in the long ***молекулы наследственности*** and count ***сколько раз*** a hummingbird's wings beat each second. What makes something "***живое***"? Anyone could deduce that a ***скачущая галопом лошадь*** is alive and a car is not, ***но почему***? We cannot say, "If it moves, it's alive," because ***машина может передвигаться***, and gelatin can wiggle ***в чаше***. They certainly are not alive. Although we cannot define life with ***одно простое предложение***, we can come up with a series of seven ***характерные черты*** shared by ***живые системы***:

1. **Клеточное строение.** All organisms ***состоят из одной или более клеток***. Often too tiny to see, cells carry out the basic activities of living. ***Каждая клетка*** is bounded by a membrane that separates it from its surroundings.

2. **Ordered complexity.** All living things are both complex and highly ordered. ***Ваше тело*** is composed of many ***различные виды клеток***, each containing many complex ***молекулярные структуры***. Many ***неживые существа*** may also be ***сложные,*** but they do not exhibit this degree of ***упорядоченной*** complexity.

3. **Sensitivity.** ***Все организмы*** respond to stimuli. ***Растения*** grow toward ***источники света***, and ***зрачки ваших глаз*** dilate when you walk into ***темная комната***.

4. ***Рост, развитие, и самовоспроизведение (репродукция)***. ***Все организмы*** are capable of growing and reproducing, and ***все они*** possess ***молекулы наследственности*** that are passed to their ***потомство***, ensuring that the offspring are of the same ***вида***.

5. **Energy utilization.** ***Все организмы*** take in energy and use it to perform many kinds of work. ***Каждая мышца*** in your body is powered with ***энергией*** you obtain ***из еды*** you eat.

6. ***Саморегуляция (Гомеостаз)***. ***Все организмы*** maintain ***относительно постоянные*** internal conditions that are different from their ***окружающая среда***, a process called ***гомеостаз.***

7. Evolutionary adaptation. ***Все организмы*** interact ***с другими организмами*** and the nonliving environment in ways that ***влияют на их выживание***, and ***как следствие***, ***организмы*** evolve adaptations to their environments.

2.4. Тема 4. «Экология и ее объекты. Изучение дикой природы. Морские и речные экосистемы »

Exercise 1. Read and translate the two parts of the text.

WHAT IS ECOLOGY?

Ecology can be defined as the study of relationships between organisms and the environment. Humans have been students of ecology as long as we have existed as a species. Our survival has depended upon how well we have been able to observe variations in the environment and predict the responses of organisms to those variations. The earliest hunters and gatherers had to know the habits of their animal prey and where to find food plants. Later, agriculturists had to be aware of variations in weather and soils and of how such variation might affect crops and livestock.

Today, most of earth's human population lives in cities and most of us have little direct contact with nature. More than ever before, though, the future of our species depends on how well we understand the relationships between organisms and the environment. Our species is rapidly changing earth's environment, yet we do not fully understand the consequences of these changes. For instance, human activity has increased the quantity of nitrogen cycling through the biosphere, changed land cover across the globe, and increased the atmospheric concentration of CO. Changes such as these threaten the

diversity of life on earth and may endanger our life support system. At the dawn of the twenty-first century, it is imperative that we once again become ardent students of ecology.

Behind the simple definition of ecology lies a broad scientific discipline. Ecologists may study individual organisms, entire forests or lakes, or even the whole earth. The measurements made by ecologists include counts of individual organisms, rates of reproduction, or rates of processes such as photosynthesis and decomposition. Ecologists often spend as much time studying non-biological components of the environment, such as temperature or soil chemistry, as they spend studying organisms. Meanwhile, the "environment" of organisms in some ecological studies may be other species. While you may think of ecologists as typically studying in the field, some of the most important conceptual advances in ecology have come from ecologists who build theoretical models or do ecological research in the laboratory. Clearly, our simple definition of *ecology* does not communicate the great breadth of the discipline or the diversity of its practitioners. To get a better idea of what ecology is, let's briefly review the scope of the discipline.

Overview of Ecology

The discipline of ecology addresses environmental relationships ranging from those of individual organisms to factors influencing the stale of the entire biosphere. This broad range of subjects can be organized by arranging them as levels in a hierarchy of ecological organization.

Historically, the ecology of individuals has been the domain of physiological ecology and behavioral ecology. Physiological ecologists have emphasized the evolution (a process by which populations change over time) of physiological and anatomical mechanisms by which organisms solve problems posed by physical and chemical variation in the environment. Meanwhile, behavioral ecologists have focused principally on evolution of behaviors that allow animals to survive and reproduce in the face of environmental variation. Physiological ecology and behavioral ecology are both guided by evolutionary theory.

There is a strong conceptual linkage between ecological studies of individuals and of populations particularly where they concern evolutionary processes. Population ecology is centered on the factors influencing population structure and process, where a population is a group of individuals of a single species inhabiting a defined area. The processes studied by population ecologists include adaptation, extinction, the distribution and abundance of species, population growth and regulation, and variation in the reproductive ecology of species. Population ecologists are particularly interested in how these processes are influenced by non-biological and biological components of the environment.

Bringing biological components of the environment into the picture takes us to the next level of organization, the ecology of interactions such as predation, parasitism, and competition. Ecologists who study interactions between species have often emphasized the evolutionary effects of the interaction on the species involved. Other approaches explore the effect of interactions on population structure or on properties of ecological communities.

The definition of an ecological community as an association of interacting species links community ecology with the ecology of interactions. Community and ecosystem ecology have a great deal in common, since both are concerned with the factors controlling multispecies systems. However, the objects of their study are slightly different. While community ecologists concentrate on the organisms inhabiting an area, ecosystem ecologists include the ecological community in an area plus all of the physical and chemical factors influencing the community.

To simplify their studies, ecologists have long attempted to identify and study isolated communities and ecosystems. However, all communities and ecosystems on earth are open systems subject to exchanges of materials, energy, and organisms with other communities and ecosystems. The study of these exchanges, especially among ecosystems, is the intellectual territory of landscape

ecology. However, landscapes are not isolated either but part of geographical regions subject to large-scale and long-term regional processes. These regional processes are the subjects of geographic ecology. Geographic ecology in turn leads us to the largest spatial scale and highest level of ecological organization - the biosphere, which falls within the realm of global ecology.

Exercise 2. Read the text and try to understand it.

The scale of Ecology

Ecology ranges in scale from the study of an individual organism through the study of populations to the study of communities and ecosystems. There are several broad areas of ecology: organismal, population, community, and ecosystem ecology.

1. Organismal ecology investigates how adaptations and choices by individuals affect their reproduction and survival. Organismal ecology can be divided into two subdisciplines. The first, physiological ecology, investigates how organisms are physiologically adapted to their environment and how the environment impacts the distribution of species. Much of this chapter discusses physiological ecology. The second area, behavioral ecology, focuses on how the behavior of an individual organism contributes to its survival and reproductive success, which, in turn, eventually affects the population density of the species.

2. Population ecology describes how populations grow and interact with other species. Population ecology focuses on groups of interbreeding individuals, called populations. A primary goal is to understand the factors that affect a population's growth and determine its size and density. Although the attention of a population ecologist may be aimed at studying the population of a particular species, the relative abundance of that species is often influenced by its interactions with other species. Thus, population ecology includes the study of species interactions, such as predation, competition, and parasitism. Knowing what factors impact populations can help us lessen species endangerment, stop extinctions, and control invasive species.

3. Community ecology focuses on what factors influence the number of species in a given area. On a larger scale, community ecology studies how populations of species interact and form functional communities. In a forest, there are many populations of trees, herbs, shrubs, grasses, the herbivores that eat them, and the carnivores that prey on the herbivores. Community ecology focuses on why certain areas have high numbers of species (that is, are species rich), while other areas have low numbers of species (that is, are species poor). Although ecologists are interested in species richness for its own sake, a link also exists between species richness and community function. Ecologists generally believe that species-rich communities perform better than species-poor communities. It has also been proposed that more species make a community more stable, that is, more resistant to disturbances such as introduced species. Community ecology also considers how species composition and community structure change over time and, in particular, after a disturbance, a process called succession.

4. Ecosystem ecology describes the passage of energy and nutrients through communities. An ecosystem is an interacting system of a community of organisms and the physical environment in which they live. Ecosystem ecology deals with the flow of energy and cycling of chemical elements among organisms within a community and between organisms and the environment. Following this flow of energy and chemicals necessitates an understanding of feeding relationships between species, called food chains. In food chains, each level is called a trophic level, and many food chains interconnect to form complex food webs. The second law of thermodynamics states that in every energy transformation, free energy is reduced because heat energy is lost in the process, and the entropy of the system increases. There is, therefore, a unidirectional flow of energy through an ecosystem, with energy dissipated at every step. An ecosystem needs a recurring input of energy from an external source—in

most cases, the sun—to sustain itself. In contrast, chemicals such as nitrogen do not dissipate and constantly cycle between abiotic and biotic components of the environment, often becoming more concentrated in organisms in higher trophic levels.

Exercise 3. Match the questions to each of the broad areas of ecology

The scale of ecology.

(a) _____ What is the temperature tolerance of this zebra?

(b) _____ What factors influence the growth of zebra populations in Africa?

(c) _____ What factors influence the number of species in African grassland communities?

(d) _____ How do water, energy, and nutrients flow among plants, zebras, and other herbivores and carnivores in African grassland communities?

Exercise 4. Give the definitions to the following key terms: *adaptation, biosphere, ecology, ecosystem, ecotone, epiphyte, evolution, nutrient, phase transition.*

1. a process that changes populations of organisms over lime. Since it ultimately involves changes in the frequency of heritable traits in a population, we can define it more precisely as a change in gene frequencies in a population.
2. a spatial transition from one type of ecosystem to another; for instance, the transition from a woodland to a grassland.
3. an evolutionary process that changes anatomy, physiology, or behavior, resulting in an increased ability of a population to live in a particular environment. The term is also applied to the anatomical, physiological, or behavioral characteristics produced by this process.
4. a plant, such as an orchid, that grows on the surface of another plant but is not parasitic.
5. the portions of earth that support life; also refers to the total global ecosystem.
6. a change in the State of matter such as from a liquid state lo a solid state or from a solid to a gas; involves changes in the organization of molecules and their kinetic state.
7. study of the relationships between organisms and the environment.
8. chemical substance required for the development, maintenance, and reproduction of organisms.
9. a biological community plus all of the abiotic factors influencing that community.

Exercise 5. Complete the text with the words and expressions given above. Translate the text.

Broad areas, exotic species, native organisms, salt concentrations, abiotic, plant abundance, population densities, biomes, interactions, biotic, natural enemies, population ecology.

Ecology is the study of 1) _____ among organisms and between organisms and their environments.

Interactions among organisms are called 2) _____ interactions, and those between organisms and their nonliving environment are termed 3) _____ interactions. These interactions, in turn, govern the numbers of species in an area and their 4) _____.

There are four 5) _____ of ecology: organismal, population, community, and ecosystems ecology.

Factors such as temperature, water, light, pH, and 6) _____ have effects on the distributions of organisms. Climate has large influence on 7) _____, the major types of habitats where organisms are found.

Plants compete with one another. Herbivores affect 8) _____, and natural enemies impact prey populations. The effects of humans on the environment include pollution, global warming, and the introduction of 9) _____ of plants and animals.

One important topic in the area of 10) _____ concerns **introduced** or **exotic species**, species moved from a native location to another location, usually by humans. Such species sometimes spread so aggressively that they crowd out 11) _____, in which case they are considered **invasive species**. One way of controlling these species, therefore, has been to import the plant's 12) _____. This is known as **biological control**.

Exercise 6. Give the written translation of the text.

MARINE BIOLOGISTS

Marine biology deals with the various species of plant and animal life that live in the oceans, seas or in any water body. Marine biologists are the scientists who conduct research on the life and the habitat of water plants and animals. Marine biologists study the aquatic ecosystems, which are conducive for the growth and cultivation of a various species of plants and animals. The modern-day marine biologists have taken up the task of mapping the marine species of animals and plants with the help of latest technology. The marine biologists believe they would be able to explore the deep oceanic depressions to find new species of plant and animal life. Here are some of the world-famous marine biologists.

Exercise 7. Read and understand the text. Give an answer the question in each passage.

THE INFLUENCE OF CLIMATE CHANGE ON WATER-BASED ECOSYSTEMS

1. What kind of problems does the deterioration of aquatic organism habitat cause?

Water-based ecosystems are particularly vulnerable to climate change, as they experience its direct influence. The threats of the climate change to aquatic habitats include changes in water temperature, location and timing of ocean currents, increased precipitations causing changes in estuaries and rising sea level, more frequent and extreme storms which imperil habitats, etc. Droughts can cause changes in lake water levels and river flows. The deterioration of aquatic organism habitat causes not only environmental problems. It can as well threaten human communities dependent on fisheries and aquaculture, reducing the global fish supply for consumption.

2. How can local ecosystems alter in fish stock?

When the sea surface temperature rises, there frequently observed harmful algae blooming. As a consequence, the level of dissolved oxygen in water decreases, plankton composition changes, fouling organisms such as parasites and pests cause incidence of diseases. Local ecosystems are altered in the composition and abundance of fish stock as to competitors, predators and invasive species. Changes in location and size of suitable range for particular species are followed by changes in timing and success of migrations and spawning. Higher sea temperature is a major cause of coral bleaching and damage to coral reef ecosystems, especially to breeding habitats, around the globe.

3. What are the causes of wild fish stock depletion?

Rising sea level can damage and destroy many coastal ecosystems such as mangroves and salt marshes, which are essential to maintaining wild fish stock. Availability of wild fish will also be harmed

by higher inland water temperatures and worsening water quality. Inland temperature changes provide favourable conditions for bringing new pathogens and predators. The abundance of food available to fishery species decreases reducing fish growth and potential yields. It even can lead to the loss of some species. It should be noted that ocean currents altering their location and timing can account for nutrient supply in surface waters and, consequently, wild fish stock productivity.

4. Why is the predicted global warming considered a threat to aquatic organisms?

Increase in frequency and intensity of storms and draughts cause changes in water salinity and water quality which may lead to the loss of wild and cultured stock. Changes in precipitation and water availability can force some species to migrate. This can result in altered distribution, composition and abundance of fish stock. Under the scenario of 2 - 6º C global warming, precipitation is forecast to decline in South-Asian regions during the dry season and increase during the wet season, expanding flood-prone areas by 23-39%. It might reduce spawning success of river fishes due to higher wet season river flows and fish survival in lower dry season flows. Human responses, like hydraulic engineering projects, can lead to the loss of habitat for many aquatic organisms, fish species included.

2.5. Тема 5. «Проблемы охраны окружающей среды. Новые технологии рационального использования биологических ресурсов»

Exercise 1. Read the text and understand its main idea. Get ready to speak on the key problem mentioned in the text.

PROBLEMS OF FISH PROTECTION. STURGEON AS AN ENDANGERED SPECIES

Historically, the oceans and seas were considered limitless and thought to harbor enough fish to feed an ever-increasing human population. However, the demands of a growing population, particularly in poorer countries, now far outstrip the sustainable yield of the seas. At the same time, fishing has become more industrialized which also resulted in wild fish stock depletion. As fisheries become depleted and fish got harder to catch, many fishermen and governments have responded with improvement in equipment and technology to be longer, harder and father away from their home ports.

Radio and satellite navigation allows fishermen to better locate fishing grounds, while new fish-aggregating devices intensify the harvest. These changes put immense pressure on the fish and leaves fewer regions out of reach so that fish can reproduce unmolested, thus exacerbating the effects of over-harvesting. Besides, there are examples of unintended by-catch, such as the capture of juvenile finfish by shrimp trawls, which have drawn severe criticism from environmental groups as they also put heavy pressure on existing stocks.

The Caspian Sea occupies the first place in the world in sturgeon species diversity, quantity and catches. The most commonly fished species are the Russian and Persian sturgeon (*Acipenser persicus*), beluga (*Huso huso*) and the sevruga (*Acipenser stellatus*).Sturgeon (*Acipenseridae***)** is by far the most commercially valuable fish. It is fished for its meat as well as for caviar which is in great demand throughout the world market. As a result, the sturgeon are subjected to a lot of illegal poaching and considered to be in a precarious condition.

The governments, fisherman and environmentalists realize that certain measures to protect wild fish stock should be taken immediately: catch limitations, minimum size limits or even capture moratoria should be imposed based on the current assessment of overexploitation of certain fish stocks. Replenishing of fish stock through using hatcheries should be provided. The urgent measures on sturgeon conservation should include the following: to stop poaching; to allow sturgeon to their spawning grounds; to increase production of juveniles at the fish farms, to prevent pollution of the

Caspian Sea and the Volga-river.

Exercise 2. Read the text given below and choose the best title for it. Translate the text. Which sentences best express the essential information of the text? Determine and put the main ideas of each paragraph into your own words.

A. Developing new technologies
B. Tiny tracking sensors
C. Revolution in ecology
D.High-tech advances at the service of ecologists
E. Impact of engineering or IT skills on scientists

There is plenty of interest in developing new technologies while also caring for the environment. There is no doubt, trying to decide how to develop and protect at the same time can be a challenge. Life scientists turn to a variety of scientific instruments and tools. Ecologists may sometimes even repurpose household items to achieve the pursued results. For instance, a tea strainer may be used to house ants or botfly larvae may be tackled with a well-aimed dab of nail polish. These days a large amount of high-tech options are becoming available for studying the natural world. As a matter of fact, ecology is on the cusp of a revolution, with state-of-the-art technologies uncovering new possibilities for insights into nature and applications for conserving biodiversity. New technologies bring tremendous opportunities for conservation and revolutionize the way we collect data on threatened species and habitats.

Ecologists use tiny tracking sensors to get new insight into the lives of animals. VHF radio telemetry was first used to electronically record the movement of animals. Since the 1960s long-distance migratory animals like caribou, shearwaters and sea turtles, have been tracked with the help of GPS and other satellite data. The use of "bio-logging" or equipping the studied animals with miniature sensors is advancing our understanding of what affects animals' movement and other behaviours. Scientists have developed plenty of miniature sensors, including accelerometers, gyroscopes, magnetometers, micro cameras, and barometers. Together, these devices make it possible to track animals' movements with unprecedented precision. These days ecologists can also measure the "physiological cost" of behaviours – that is, whether an animal is working particularly hard to reach a destination, or within a particular location, to capture and consume its prey. Taken further, placing animal movement paths within spatially accurate 3D-rendered (computer-generated) environments will allow ecologists to examine how individuals respond to each other and their surroundings. These devices could also help us determine whether animals are changing their behaviour in response to threats such as invasive species or habitat modification. In turn, this could tell us what conservation measures might work best.

Autonomous vehicles such as remotely piloted vehicles or drones are now widely used by ecologists. They make it possible to measure environments, observe species, and assess changes through time, all with a degree of detail that was never previously possible. For instances, drones used in conservation help survey cryptic and difficult to reach wildlife. Coupling autonomous vehicles with sensors (such as thermal imaging) now makes it easier to observe rare, hidden or nocturnal species. It also potentially allows scientist to catch poachers red-handed, which could help to protect animals like rhinoceros, elephants and pangolins.

Keeping electronic equipment running in the field can be a challenge. Conventional batteries have limited life spans, and can contain toxic chemicals. Solar power can help with some of these problems, but not in dimly lit areas, such as deep in the heart of rainforests. "Bio-batteries" may help to overcome this challenge. They convert naturally occurring sources of chemical energy, such as starch, into electricity using enzymes. "Plugging-in" to trees may allow sensors and other field equipment to be powered cheaply for a long time in places without sun or access to mains electricity.

3D printing provides a certain potential for ecological research. For instance, it can be used to make cheap, lightweight tracking devices that can be fitted onto animals. Besides, it can be used to create complex and accurate models of plants, animals or other organisms, for use in behavioural studies.

All of the technologies described above can be combined and used to generate more accurate research data. Imagine research stations fitted with remote cameras and acoustic recorders equipped with low-power computers for image and animal call recognition, powered by trees via bio-batteries. These devices could use low-power, long-range telemetry both to communicate with each other in a network, potentially tracking animal movement from one location to the next, and to transmit information to a central location. Swarms of drones working together could then be deployed to map the landscape and collect data from a central location wirelessly, without landing. The drones could then land in a location with an internet connection and transfer data into cloud-based storage, accessible from anywhere in the world. One of the advantages of these advancements is that they minimise the disturbance to species and ecosystems. Not only will they minimise the stress to animals and the inadvertent spread of diseases, but they should also provide a more "natural" picture of how plants, animals and other organisms interact.

Scientists should ideally possess the necessary skills and knowledge of engineering or IT. They should also be exposed to relevant technology-based training. The techno-ecological revolution requires collaboration across disciplines and industries. Several communities of conservationists, technologists, engineers, data scientists, biologists and ecologists have been established to promote and facilitate collaboration and use of new technologies. Wildlabs, the SCB *Conservation Technology Working Group*(ConsTech WG) and TechnEcology are just a few projects initiated to share information, ideas, tools and resources to discover and implement technology-enabled solutions to challenges facing our planet.

Exercise 3. Match the words with the definitions.

1. Accelerometer	**a.** an energy storing device that is powered by organic compounds;
2. Barometer	**b.** a biological molecule (typically protein) that significantly speeds up the rate of virtually all of the chemical reactions that take place within cells; a biocatalysist;
3. Bio-battery	**c.** a device measuring acceleration or the rate of change of the velocity of an object;
4. Conservation	**d.** a method of night vision that collects the infrared radiation from objects in the scene and creates an electronic image;
5. Enzyme	**e.** a device measuring air pressure and showing when the weather is likely to change;
6. Gyroscope	**f.** a device measuring magnetism - the direction, strength, or relative change of a magnetic field at a particular location;

7. Magnetometer	**g.** : a careful preservation, protection or efficient use of something, for example resources; 2: the preservation of a physical quantity during transformations or reactions;
8. Thermal imaging	**h.** a device that uses Earth's gravity for measuring or maintaining orientation and angular velocity**.**

Exercise 4. Complete the text with the words and expressions from the given below and translate the text.

Animal trackers, multiple animals, hardware control, collective activity, commonplace, monitoring activity, animal tracking suite, large-scale experimentation, physical segregation, experimental routines

Automated animal tracking methods have become _____ in the study of behavior. They enable large sample sizes, high statistical power, and more rapid inference of mechanisms giving rise to behavior. Existing _____ vary in computational complexity and are often specialized for particular imaging configurations or behavioral measurements. Trackers can assist in a wide range of experimental tasks such as _____, measuring response to stimuli, and locating body parts over time. Some trackers are designed to track and maintain identities of multiple individuals occupying the same arena while others measure the _____ of groups without maintaining identities or rely on _____ of animals to ensure trajectories never collide. But few of these trackers are designed as platforms for high throughput, _____, and flexible experimental reconfiguration. MARGO (Massively Automated Real-time GUI for Object-tracking) is a real-time _____ for custom behavioral experiments. Fast object tracking in real time allows convenient tracking of very large numbers of animals and closed-loop experiments that control stimuli for _____ in parallel. MARGO can rapidly and accurately track large numbers of animals in parallel over very long timescales. It possesses both an incorporated control of peripheral hardware and a flexible software architecture for defining new _____. These features enable closed-loop delivery of stimuli to many individuals simultaneously. MARGO is able to coordinate tracking and hardware control with two custom behavioral assays (measuring phototaxis and optomotor response) and one optogenetic operant conditioning assay. MARGO's strengths are 1) robustness, 2) high throughput, 3) flexible control of hardware and 4) real-time closed-loop control of sensory and optogenetic stimuli, all of which are optimized for _____.

Exercise 5. Translate the text into English.

Ученые работают над умными датчиками и роботизированной рыбой, которые позволят им находить и идентифицировать загрязнение водных водоемов на ранних стадиях. Такие датчики дают возможность обнаруживать и справляться с разливами вредных веществ в режиме реального времени, еще до того, как те распространятся.

Экологи, занимающиеся охраной дикой природы, создают роботизированные манки для животных, которые помогут ловить браконьеров, виртуальные геозоны для защиты находящихся под угрозой исчезновения птиц от ветровых турбин, а также анализируют данные в целях предотвращения незаконного промысла.

2.6. Тема 6. «Информационные технологии в академической и профессиональной деятельности»

Exercise 1. Read the text. Try to understand its contents.

COMMUNICATION TECHNOLOGIES.

We are living in the age of swiftly changing and developing communication technology. Among these changes is an increasing use of rapid communication devices for both interpersonal and public communication.

New media of communication alter the communication process itself. Each new medium imposes special requirements on the ways in which messages are formulated; it controls the speed and convenience with which information is transmitted or recorded; and it influences ways in which receivers reconstruct meanings from the messages they receive. New media also lead to significant changes in the social, economic, and cultural features of society.

The telephone, along with associated devices such as answering machines and voice-mail networks, continues to be one of the most widely used and important media in our society. It is so familiar that people often fail to follow appropriate norms of usage - procedures that can make it a more effective means of communication. An old medium (fax) using long-distance lines has gained in popularity as a means of transmitting written messages quickly and inexpensively.

Increasing use is being made of computer networks of various sizes and complexities for the transmission of many categories of information. Electronic mail is typed into a sender's computer to be read on screen at his or her convenience. E-mail is very fast and convenient, and it is replacing slower, paper media for many purposes.

Larger networks of computers linked together in local, national and international systems become now available and they are creating a quiet but profound communication revolution. It has already brought remarkable modifications in the ways by which people communicate in our society. An example is Internet which brings together 2000 other networks in 35 countries. People are able to exchange written messages more rapidly on a worldwide basis. With a 10-cm movement of your mouse and a click of a button you can jump from Australia to Europe in less time than it takes to read this paragraph.

With the various media by which we can communicate quickly and over large distances we must askhow these will have an influence on the human condition. Computer conference can be useful to those who wishes to learn about the new goods, books or films, it is simply irreplaceable for fans to chat on a favourite theme with the adherents in all corners of the Earth, and, certainly, for scientific discussions. By means of conference it is possible to discuss an interesting theme in such a company, to collect which in one place for personal meeting would cost a fantastic sum and unpredictable expenses of time and forces.

Will we be brought closer together or will the new communication technologies enable a minority of human beings to become information rich while the vast majority remains outside these systems and information poor?

Exercise 2. Write true (T) or false (F) for each of the sentences below according to the information given in the text.

1. One of the most widely used and important media in our society is a computer.
2. We live in a time of rapid change and revolution in communication technologies.
3. New communication media result in insignificant changes in the social, economic and cultural features of society.
4. People may take advantage of their Internet connectivity at work to obtain information and software (using e-mail and file transfer protocol).
5. Due to Internet people are provided with a point-and-click connection to computer systems throughout the world.
6. The popularity of fax machines as a means of transmitting oral messages quickly and expensively has increased greatly over the- past years.
7. The dependence -on calculators and computers tends to weaken young people's mental abilities.

8. Electronic mail is faster and more convenient than traditional slow paper media and is beginning to replace them.

9. New communication technologies will enable a lot of people to become information rich.

10. Computer networks of various sizes and complexities for the transmission of many categories of information are being widely used nowadays.

Exercise 3. Read the passage right through and then choose the best continuation for each of the following.

1. We are living in an age … .
   a. of fax machines, cellular phones, home offices and worldwide communications;
   b. of quickly changing and developing communication technologies;
   c. of transition from the defense industry to the commercial sector.
2. Telephone is an instrument … .
   a. for transmitting the sound of the voice by electricity;
   b. for making copies of documents and sending them down telephone lines to another place;
   c. for sending information from one computer down telephone lines to another computer.
3. New media of communication lead to … .
   a. translation from visual language into a verbal language, much as a foreign-born person thinks in his native tongue and then translates in his mind before speaking in English;
   b. significant changes in the social, economic and cultural features of society;
   c. a quiet but profound communication revolution.
4. Fax machine is a means of … .
   a. transmitting written messages quickly and inexpensively;
   b. copying documents and sending them down telephone lines to another place;
   c. recording moving pictures and sound.
5. Electronic mail is … .
   a. typed into a sender's computer to be read on screen at his or her convenience;
   b. the government system of carrying and delivering letters;
   c. beginning to replace paper media as it is very fast and more convenient.
6. With the various media … .
   a. we can communicate quickly and over large distances;
   b. a minority of people is sure to become information rich;
   c. a majority of people is certain to become information poor.
7. Due to Internet you are able … .
   a. to jump from Australia to Europe just with a 10-cm movement of your mouse and a click of a button;
   b. to exchange written messages more rapidly on a worldwide basis;
   c. to leave a message in the absence of the owner of the computer.

Exercise 4. Read the paragraph about computers - one of the most important means of communication. Fill in each gap with the appropriate word given in the box.

hands, tubes, kinds, development, replaced, due, calculations, computer, devices, today, boom, faster, example, had, known, these.

Computers may have a short history but prior to their _____, there were many other ways of doing_____. These calculations were done using _____that are still used_____; the slide rule being a perfect, not to mention the ten fingers of the. These machines, unlike computers, are non-electronic and were by faster calculating devices. It wasn't until the mid-1940s that the first digital _____was built. The post-war industrial _____saw the development of computers take shape. By the 1960s, computers were _____ than their

predecessors and semiconductors _____replaced vacuum _____which were replaced in a few years by tiny integrated circuit boards. to microminiaturization in the 1970s, circuits were etched onto wafer-thin rectangular pieces of silicon. This integrated circuitry is _____as a chip and is used in microcomputers of all_____.

Exercise 5. Discuss with your friend the most widely used means of communication. When making up a conversation you may use these questions as starting points:

a) Which means of communication do you frequently use and why?

b) Which means of communication would you like to have?

c) Which do you think is the most convenient and reliable?

d) What means of communication will prevail in the 21st century? Which one will be of primary importance? What is your point of view?

Exercise 6. Read the text and write an annotation to it.

The digital age.

We are now living in what some people call *the digital age,* meaning that computers have become an essential part of our lives. Young people who have grown up with PCs and mobile phones are often called *the digital generation.* Computers help students to perform mathematical operations and improve their math's skills. They are used to access the Internet, to do basic research and to communicate with other students around the world. Teachers use projectors and interactive whiteboards to give presentations and teach sciences, history or language courses. PCs are also used for administrative purposes - schools use word processors to write letters, and databases to keep records of students and teachers. A school website allows teachers to publish exercises for students to complete online. Students can also enroll for courses via the website and parents can download official reports.

Mobiles let you make voice calls, send texts, email people and download logos, ringtones or games. With a built-in camera you can send pictures and make video calls in *face-to-face* mode. New smartphones combine a telephone with web access, video, a games console, an MP3 player, a personal digital assistant (PDA) and a GPS navigation system, all in one.

In banks, computers store information about the money held by each customer and enable staff to access large databases and to carry out financial transactions at high speed. They also control the cashpoints, or ATMs (automatic teller machines), which dispense money to customers by the use of a PIN-protected card. People use a Chip and PIN card to pay for goods and services. Instead of using a signature to verify payments, customers are asked to enter a four-digit personal identification number (PIN), the same number used at cashpoints; this system makes transactions more secure. With online banking, clients can easily pay bills and transfer money from the comfort of their homes.

Airline pilots use computers to help them control the plane. For example, monitors display data about fuel consumption and weather conditions. In airport control towers, computers are used to manage radar systems and regulate air traffic. On the ground, airlines are connected to travel agencies by computer. Travel agents use computers to find out about the availability of flights, prices, times, stopovers and many other details.

2.7. Тема 7. «Моя научная работа. Объект и предмет магистерской диссертации»

Exercise 1. Read the text and make sure you understand it.

INTERNATIONAL SCIENTIFIC EVENTS

In order to share research findings, network with their colleagues and explore new ideas, scientist with common interests try to participate in various scientific meetings. Being the heart of scientist's professional life, such meetings are organized either in collaboration or on their own by professional associations, scientific societies, institutions of higher education. Quite a lot of scientific events are held by international learned societies and may come under different names: a congress, a conference, a symposium, a workshop. A large meeting is usually called "*a conference*". It is devoted either to a particular topic, or encompasses a wide variety of related topics. International scientific events are typically held annually or on some other regular basis, e.g. every other year.

To ensure a successful international science conference, an organizing committee should be chosen. There is no doubt that to organize a scientific meeting is a real challenge for the members of organizing committee. That is why it is very important for the members of the committee to assume responsibilities for certain activities and follow a well-known procedure (or observe certain simple "rules"). The work on organizing a scientific event should start as early as possible, preferably from nine to twelve months ahead of the conference. A host country should be chosen, venue selected, date and timing decided, sponsors are found. Choosing a location that is easily accessible for most of the attendees from around the world is important. Deciding whether a conference should be held during the working week or over a long weekend is also necessary.

The information about the conference is announced via the Internet and an invitation or Call for Papers (CFP)/Call for Abstracts is sent to prospective presenters using a mailing list. The CFP describes the topics to be discussed, advises on the formalities: what kind of abstract or paper an attendee is expected to submit, to whom, how and by what deadline, the information on registration fees, venue and accommodation. A member of organizing committee in charge reviews, accepts or declines scientific submissions and makes a list of participants. The science being the most important thing, another important step is to invite outstanding keynote speakers (keynotes) i.e. scientists who are leaders in their field. It is recommended to have some backup speakers on standby in case of cancellation. The topic of the conference should meet the needs of the target audience, so it is a good idea to offer the invited speakers some guidelines as to the issues to be covered in their talks.

The programme of the conference includes plenary sessions, panels, poster presentation. The organizers appoint the chairman who directs the course of the conference and runs the plenary session, while the work of panels are directed by moderators chosen by the organizing committee from the participants. The duties of the chairman and moderators include announcing the agenda, introducing speakers, opening, directing and closing debates/discussion. The chairing person may require a speaker to stick to the time limit. The schedule of the conference should allow for enough coffee breaks which provide participants with perfect opportunity to learn about others' ideas and research, to socialize, to be face known in the community. As a rule, the organizing committee considers optional cultural activities: a tour of the city, a visit to a museum, a theatre trip.

Organizing committee also considers the need for conference rooms of various sizes, space for poster presentation, technical support, proceedings publishing, awards, etc. The delegated responsibilities may vary from content and design of the Web site promoting the scientific meeting, uploading videos of the conference talks and/or photos, facilities for teleconference (WiFinetworks) to manning the registration tables, carrying microphones during debates, checking presentations ahead of time as well as other things which are easily forgotten. The feedback about the event from the participants helps evaluate the conference as successful.

Exercise 2. Answer the questions.

1. Under which names are scientific events known?
2. What is the aim of international scientific conferences?
3. Which issues does the organizing committee consider at the early stage of their work?
4. What kind of information does the CFP contain?
5. How is the schedule of the conference organized?
6. Whom do organizers prefer to invite as keynote speakers?
7. What are the duties of the chairman and moderators?
8. What are the routine responsibilities of organizing committee members?
9. Why is the feedback from the participants important for the organizers of any scientific event?

Exercise3. Give English equivalents of the following Russian words and word combinations.

Принимающая страна; участник (2), пленарное заседание; председатель, раз в два года; учесть потребности целевой аудитории; укомплектовать штатом столы регистрации; рассылать приглашения; культурные мероприятия; общение, спонсоры, научные сообщества; доступный, размещать в сети Интернет.

Exercise4. Give Russian equivalents of the following English words and word combinations.

Organizing committee; a panel (session); to encompass a wide variety of topics; responsibilities, to be in charge of; a mailing list; conference talks; keynote speakers, moderator, venue, timing, poster presentation; to schedule the conference; ahead of time; the agenda; to hold a scientific event; issues to be covered.

Exercise 5. Complete the text with the appropriate words and word combinations choosing from the given in italics. Read the text and translate it into Russian.

registration fees; poster presentations; to organize, cultural activities; delegates, local, rather than; coffee breaks; keynote speakers; sponsors, publication costs; ahead, scientific matters; previous similar conferences; senior scientists; the opportunity

Well-known researchers are often called upon … … a science conference or medical symposium. To rise to the challenge they should aim for a balance of young researchers as well as … … that are typically invited as … … . When planning a scientific meeting which attracts international … the organizers send a large number of invitations, but they also should consider bringing in … speakers whenever possible in order to provide them with … … for exchanging ideas, disseminating research and learning. It is well worth planning the event at least ten months … , so to give attendees plenty of time to work on their talks or … … . It is practical to have fewer, more extended talks … … more numerous, shorter ones.

It is a good idea to allow for plenty of … … and consider having coffee stands in the poster presentation area to promote networking opportunities. The primary source of funds for the expenses are … that should be attracted by the organizers, next coming the delegates' … … . The latter also include the … … for proceedings in a journal. Optional … … such as a theater performance, a tour of the city or a sport event also should be considered to provide a refreshing breaks from concentration on … … . A template that others have used for … … … can be a big help for the organizers of a scientific event.

Exercise 7. Get ready to speak on your research and your Master's thesis. **Use the following hints and write it up.**

1. Define the subject and main objectives of your research. What is the topic/theme of your thesis/dissertation?
2. Describe briefly the historic background of the problem (or theory/hypothesis/field, etc.) you have chosen.
3. Say, why the problem is of interest to you, and for how long you have been studying it.
4. How many stages does your research include and of how many parts/chapters does your thesis/dissertation consist?
5. Which scientific methods (or techniques, procedures, etc.) do you use in your research? (Observation, experiment, data analysis, etc)
6. What results are you going to obtain (or have you already obtained) while carrying out your research?
7. Where and how do you plan to implement/ to apply these results? Can you estimate the significance of your results?
8. In which way is your research related to your current activity/job?

Список информационных источников

Богатырева, О. А. Иностранный язык (английский): учебное пособие / О. А. Богатырева, Е. В. Якушко. — Новосибирск: НГТУ, 2021. — 168 с. — ISBN 978-5-7782-4559-4. — Текст : электронный // Лань: электронно-библиотечная система. — URL: https://e.lanbook.com/book/306479

Иностранный язык для академического общения: базовый уровень: учебное пособие / составители Е. А. Захарчук, И. П. Кривко. — Курск: КГУ, 2021. — 45 с. — Текст: электронный // Лань : электронно-библиотечная система. — URL: https://e.lanbook.com/book/219452

Иностранный язык. Английский язык в сфере экологии и природопользования. Грамматика : учебное пособие. — Санкт-Петербург: СПбГУТ им. М.А. Бонч-Бруевича, 2018 — Часть 2 — 2018. — 76 с. — Текст : электронный // Лань: электронно-библиотечная система. — URL: https://e.lanbook.com/book/180030

Карамышева, С. Г. Иностранный язык (английский) в сфере природообустройства и водопользования : учебное пособие / С. Г. Карамышева. — Краснодар : КубГАУ, 2020. — 90 с. — ISBN 978-5-907373-03-7. — Текст : электронный // Лань: электронно-библиотечная система. — URL: https://e.lanbook.com/book/302858

Малышкина, Е. А. Иностранный язык (английский): учебное пособие / Е. А. Малышкина, Н. Г. Трифонова. — Самара : СамГУПС, 2019. — 176 с. — Текст: электронный // Лань : электронно-библиотечная система. — URL: https://e.lanbook.com/book/161300

Молодых, Е. А. Иностранный язык (английский): учебное пособие / Е. А. Молодых, С. В. Павлова. — Воронеж : ВГУИТ, 2019. — 111 с. — ISBN 978-5-00032-441-7. — Текст: электронный // Лань : электронно-библиотечная система. — URL: https://e.lanbook.com/book/143262

Рябкова, Е. С. Учебное пособие по английскому языку для студентов 1 и 2 курсов дневного отделения всех специальностей, изучающих иностранный язык в неязыковом ВУЗе: учебное пособие / Е. С. Рябкова, И. Н. Табуева. — Самара : ПГУТИ, 2020. — 129 с. — Текст: электронный // Лань : электронно-библиотечная система. — URL: https://e.lanbook.com/book/255581