

Министерство образования и науки РФ
Федеральное государственное бюджетное образовательное
учреждение высшего образования
«Кузбасский государственный технический университет
имени Т. Ф. Горбачёва»

Составитель
П. А. Стрельников

**КОНТРОЛЬНЫЕ РАБОТЫ
ПО ИНОСТРАННОМУ ЯЗЫКУ (АНГЛИЙСКИЙ)**

**Методические указания к контрольной работе
для студентов заочной формы обучения**

Рекомендовано учебно-методической комиссией направления
13.03.01 «Теплоэнергетика и теплотехника»
в качестве электронного издания для самостоятельной работы

Кемерово 2016

Рецензент:

Зникина Л. С. – заведующий кафедрой иностранных языков КузГТУ,
профессор, доктор педагогических наук

Стрельников Павел Алексеевич

Контрольные работы по иностранному языку (английский):
методические указания к контрольной работе [Электронный ресурс] для
студентов направлений «Теплоэнергетика и теплотехника»,
«Электроэнергетика и электротехника» заочной формы обучения / сост.
П. А. Стрельников; КузГТУ. – Электрон. дан. – Кемерово, 2016. – Систем.
требования : Pentium IV ; ОЗУ 8 Мб ; Windows 93; мышь. – Загл. с экрана.

Целью методических указаний является организация самостоятельной работы студентов заочной формы обучения, направленной на формирование у них такой общекультурной компетенции, как готовность к использованию одного из иностранных языков.

© КузГТУ, 2016

© Стрельников П. А.,
составление, 2016

Предисловие

Цель указаний – формирование у студентов такой общекультурной компетенции, как готовность к использованию одного из иностранных языков.

Упражнения и задания, представленные в контрольных работах, направлены на обеспечение практического владения студентами английским языком на уровне умения самостоятельного чтения литературы по направлениям подготовки. Сопутствующая задача – обеспечить корректировку и выравнивание уровня знаний, умений и навыков студентов заочного отделения, приступающих к изучению иностранного языка в вузе.

Проработка практических материалов данных указаний обеспечивает необходимую и достаточную базу для перехода к работе с текстами по широким вопросам будущей профессиональной деятельности студента.

1. Каждая контрольная работа представлена в пяти вариантах. **Номер варианта** определяется по последней цифре шифра зачетной книжки студента. Если шифр оканчивается на 1 или 2, вариант – № 1; на 3 или 4 – № 2; на 5 или 6 – № 3; на 7 или 8 – № 4; на 9 или 0 – № 5.

2. Контрольные работы распределяются по семестрам следующим образом:

<i>Семестр</i>	<i>Номер контрольной работы, подлежащей выполнению</i>
I	Контрольная работа №1
II	Контрольная работа №2

3. Работы выполняются **в письменном виде** и представляются в деканат за месяц до начала сессии. На обложке тетради должны быть четко представлены следующие данные: название языка (английский); номер и вариант контрольной работы; фамилия, имя, отчество (студента); группа и шифр.

4. Работы выполняются на развернутых листах (первая страница остается чистой). По краям обеих страниц оставляются поля для замечаний и методических указаний рецензента.

Образец расположения материала контрольной работы

Поля	Левая страница	Правая страница	Поля
	Контрольная работа №1		
	№ задания и его формулировка		
	Английский текст	Русский текст	
	I.	I.	
	Необходимые по заданию объяснения		
	II.	II.	

5. Работы с пометой рецензента «К защите» остаются на кафедре и дорабатываются студентом во время сессионных занятий под руководством преподавателя. Исправление ошибок осуществляется на основе замечаний рецензента с помощью

необходимого грамматического раздела учебника или самоучителя и словарей.

6. Работы с пометой «Незачет» возвращаются студенту до начала сессии на переработку. Работа, выполненная без соблюдения предъявляемых требований или не полностью, возвращается без проверки.

7. Зачет по дисциплине «Иностранный язык» (I семестр) ставится по итогам защиты контрольной работы.

8. Экзамен по дисциплине «Иностранный язык» (II семестр) состоит из следующих заданий:

1. *Письменный перевод текста по широкому или узкому профилю специальности с использованием словаря (1000-1200) п.зн. Время подготовки: 45 минут.*

2. *Аннотация (на русском или английском языке) текста по специальности без словаря (2000-2500) п.зн. Время подготовки 15 минут.*

3. *Прослушивание текста профессиональной тематики. Продолжительность звучания до 3 минут; двукратное предъявление. Форма проверки – тест на понимание содержания текста.*

4. *Устное изложение или беседа по одной из пройденных тем (15-20 предложений):*

- *КузГТУ*
- *Моя специальность*
- *Система образования в России и за рубежом*
- *Экология*
- *Кузбасс*
- *Термоэлектричество*
- *Паровые турбины*
- *Выдающиеся ученые и их открытия*

КОНТРОЛЬНАЯ РАБОТА № 1

Вариант 1

I. Запишите и переведите предложения, обращая внимание на степени сравнения прилагательного и наречия.

1. The more hazardous is an occupation; the more important is safety aspect of an industry.

2. The greatest advantage of this system is that it is much cheaper than the previous one.

3. The most difficult thing in their experiment was to keep temperature constant.

II. Запишите и переведите предложения, обращая внимание на значение неопределенных и отрицательных местоимений.

1. Any of scientists can take part in this important experiment.

2. Only some years ago there was no modern equipment in this laboratory

3. These devices are very efficient but they have some drawbacks.

III. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите, обращая особое внимание на перевод пассивных конструкций.

1. As with all modern scientific and technological endeavors, computers and software play an increasingly important role.

2. Engineers apply mathematics and physics to find suitable solutions to problems or to make improvements.

3. The development of this hypothesis was undertaken by numerous investigators.

4. Engineers are now required to have knowledge of relevant sciences for their design projects.

IV. Запишите предложения и подчеркните в них модальный глагол или его эквивалент. Переведите.

1. Mathematical analysis is used when the facts can be presented in numbers.

2. These researchers will have to use up-to-date materials in their modern apparatus.

3. As the construction of the new plant was an international project, scientists from different countries had to take part in it.

4. The foreman is the person who gives instructions how the work is to be done.

V. Запишите и переведите предложения, обращая внимание на разные значения слова *it*.

1. It was important to test the properties of the material before using it.

2. Computer is widely used in modern engineering because it allows solving complex problems.

3. It is light weight of this metal which made it possible to use it for various purposes.

VI. Запишите и переведите предложения, обращая внимание на бессоюзные дополнительные и определительные придаточные предложения.

1. Everyone knows electricity produces heat.

2. The device the engineer is speaking about will be used for new technologies.

VII. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 2, 3 и 4.

ACADEMICIAN LAVRENTYEV

1. No problem in physics, mechanics and many other branches of science can be solved without mathematics. One of the brilliant representatives of this field is the Russian mathematician Michail Lavrentyev. As his father was a mathematics lecturer the boy often heard scientific conversation at home. This, he said, was the stimulus for his first interest in science.

2. Studying at Moscow University he came under the influence of a leading Russian mathematician N. N. Luzin whose research formed the basis for a new school of mathematics. It was that school which greatly influenced M. Lavrentyev's life.

3. He was teaching practically all his life, combining it with research work. One of his theoretical studies led to an unexpected result which could be applied to the problem of cumulative (кумулятивный, направленный) explosions. Thanks to a theory of controlled explosions developed by Lavrentyev it became possible to predict how much and where rock and soil which were to be exploded could move. This theory was applied when damming a river to prevent the floods damaging Alma-Ata.

4. A special creation of the Academician was the Siberian Department of the Russian Academy of Sciences or Academgorodok as it is more known. Lavrentyev is often referred to as «father» of Academgorodok because it was him who flew around Siberia in the 1950s and chose the spot for the new science town near Novosibirsk. There were good reasons for the town's location in Siberia because this area was potentially very rich and needed a scientific and technological base for its development.

5. Today Academgorodok is based on a triangle which is organically linked with Lavrentyev's own life. His personal experience showed that successful research was impossible without its high quality, close links between science and industry, training of the next scientific generation.

VIII. Просмотрите 5-ю часть теста и ответьте на вопрос: *Why is the basis of Academgorodok called a «triangle»?* Запишите и переведите вопрос и ответ.

Вариант 2

I. Запишите и переведите предложения, обращая внимание на степени сравнения прилагательного и наречия.

1. Rational use of natural resources is the most vital problem of the country's national economy.

2. The heavier the equipment, the more difficult is to install it.

3. The old device was more valuable for our research than the new one.

II. Запишите и переведите предложения, обращая внимание на значение неопределенных и отрицательных местоимений.

1. Nobody knows anything about this problem.
2. Will you carry out any experiment in our research laboratory this year?
3. We invited some skilful engineers for the construction of the new industrial object.

III. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите, обращая особое внимание на перевод пассивных конструкций.

1. Many scientists from different countries entered the new field of research.
2. Automation is being increasingly used in all branches of national economy.
3. It is not surprising that every great discovery is much spoken about.
4. High speed electronic machines have introduced great changes in making mathematical calculations.

IV. Запишите предложения и подчеркните в них модальный глагол или его эквивалент. Переведите.

1. Our laboratory has to investigate a series of accidents that have taken place in the locality within the last three months.
2. Every future engineer should know such subjects as physics and mathematics.
3. Pressures in our experimental work will not be allowed to exceed 5,500 psi (pounds per square inch).
4. For a long time researchers were unable to resolve this scientific problem.

V. Запишите и переведите предложения, обращая внимание на разные значения слова *it*.

1. Automation is the use of machines to optimize productivity; it can be useful for many industrial applications.
2. It is obvious that we have to do all possible to reduce atmospheric pollution.

3. It was the Industrial Revolution which promoted the development of engineering.

VI. Запишите и переведите предложения, обращая внимание на бессоюзные дополнительные и определительные придаточные предложения.

1. The properties of materials the designers use for these technologies do not react to temperature changes.

2. We know some industrial areas are considered dangerous for living in them.

VII. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 4 и 5.

PYOTR KAPITSA

1. The name of Pyotr Leonidovich Kapitsa speaks for itself: in history of physics there are few scientists that can be placed next to him.

2. Kapitsa was the son of a general, a famous military engineer who had built the Kronstadt fortress. He graduated from the electromechanical faculty of the Petersburg Polytechnic Institute – perhaps the best technical educational establishment in Russia at that time. It was there that he took interest in physics.

3. In 1921 Kapitsa was sent abroad to continue studying. The young physicist attracted universal attention at the world-famous Cavendish Laboratory headed by Ernest Rutherford, the founder of experimental nuclear physics. Very soon Kapitsa established an unusual record – he completed the laboratory course in two weeks instead of the usual two years. After that, Rutherford took personal interest in him and Kapitsa became his favorite pupil.

4. In 1934 Kapitsa returned to Russia and was appointed a director of the Institute of Physical Problems. During the war years he began to work in an entirely new field of science and technology – high-power (высоковольтный) electronics.

5. It is known today that electronics means small currents. Electronic devices – electronic tubes, for example, – operate on electrons, that is, particles having a very small mass and a very high

mobility. At that time scientists thought that it was impossible to transmit great amounts of power over long distances by means of electronics. Kapitsa disproved this «axiomatic truth» and showed that the electrons were able to transmit millions of kilowatts of energy over great distances. Kapitsa's high-power electronics has a fantastic future. Electric power will flow all over the country. Using waveguides (волновод) mankind will be able to send it directly to Earth satellites and orbital stations in space.

VIII. Просмотрите 4-ю часть и выберите из предложенных вариантов правильное продолжение предложения: *A lot of scientists were interested in Kapitsa ...* . Запишите все предложение и переведите его.

- 1) because he was Rutherford's favorite pupil.
- 2) because he needed only two weeks to complete his study.
- 3) because he was the head of the Cavendish Laboratory.

Вариант 3

I. Запишите и переведите предложения, обращая внимание на степени сравнения прилагательного и наречия.

1. The more scientists work in studying the problem, the more reliable are the research results.
2. Today engineers have to study more subjects from various fields of science.
3. At present coal is one of the cheapest sources for power generation.

II. Запишите и переведите предложения, обращая внимание на значение неопределенных и отрицательных местоимений.

1. According to Albert Einstein nothing can move faster than light.
2. Any industry needs modern machinery to improve its production.
3. Some 250 scientists from more than 40 countries gathered for this international conference.

III. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите, обращая особое внимание на перевод пассивных конструкций.

1. Lectures in up-to-date engineering were always attended by a great number of students and young scientists.

2. Electric power flows over the electric transmission lines all over the country.

3. Engineering development can be traced back several thousand years around the world.

4. They will have completed the construction of the new industrial complex by autumn.

IV. Запишите предложения и подчеркните в них модальный глагол или его эквивалент. Переведите.

1. As a skilled worker he could easily start and stop every kind of engine.

2. This research work may require much money and time.

3. Such instruments were to be used to make measurements and to express these measurements in physical units.

4. Engineers will have to use new equipment to improve several operations.

V. Запишите и переведите предложения, обращая внимание на разные значения слова *it*.

1. When the capacity had been increased it exceeded the technological limits.

2. This discovery was made in 1938. It is a cornerstone of many engineering processes now.

3. It was necessary to review some aspects of the problem once again.

VI. Запишите и переведите предложения, обращая внимание на бессоюзные дополнительные и определительные придаточные предложения.

1. We were told the experiments with this equipment had been completed successfully.

2. This process is based on the phenomena we have studied at our laboratory.

VII. Прочитайте весь текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 2, 4 и 5.

ERNEST RUTHERFORD

1. Rutherford's 42 years of active research work, which only ended at his death in 1937, resulted in important advances in the theory of «atomic energy» as we know it today. It all began with Becquerel's accident discovery of radioactivity in 1896, which was soon followed by the Curies' isolation of polonium and radium. The whole scientific world knows that this great discovery opened up new scientific fields awaiting to be conquered.

2. Many scientists from different countries became interested in the new field of radioactivity. One of them was the young New Zealander, Ernest Rutherford, who at the age of 27 (1898) was appointed to the chair of physics at the University of Montreal. It was him who made a great number of really important discoveries.

3. The first of his great researches was made in Montreal and led him to formulate the laws of radioactive transformations. Perhaps the greatest of all Rutherford's discoveries was made at Manchester, where he went in 1907. This was the nuclear model of the atom.

4. The main part of the radioactive transformation theory was the spontaneous transformation of one nucleus into another but the artificial transformation of nuclei was achieved only in 1919. This experiment, marking the beginning of modern nuclear physics, was made by Rutherford himself with simple apparatus and one assistant.

5. The splitting of atom has opened to man a new and enormous source of energy because in the splitting process the nucleus matter is converted into energy. But before nuclear energy (now officially miscalled *atomic* energy) could be used, two more major discoveries were needed. These were the discovery of the neutron and of the fission (деление) of uranium nucleus made by James Chadwick (Чедвик) and Otto Hahn (Ган), respectively. The last one was made after Rutherford's death.

VIII. Просмотрите 1-ю часть текста и ответьте на вопрос: *Was Becquerel's discovery of radioactivity based on the Curies' discovery of radium?* Запишите и переведите вопрос и ответ.

Вариант 4

I. Запишите и переведите предложения, обращая внимание на степени сравнения прилагательного и наречия.

1. The lowest production rate was partly explained by the usage of obsolete equipment.

2. These devices are the most effective instruments for studying properties of various materials.

3. The higher is the qualification of an engineer, the more difficult problems he can solve.

II. Запишите и переведите предложения, обращая внимание на значение неопределенных и отрицательных местоимений.

1. We needed some 20 minutes to check and adjust the measuring instrument.

2. Anybody can explain you the operational principles of that apparatus.

3. Any skilled operator can easily start and stop the engine.

III. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите, обращая особое внимание на перевод пассивных конструкций.

1. Last month the workers fulfilled the plan ahead of schedule.

2. The delegation of German engineers will come to our region to share experience with our workers.

3. This unique apparatus has been invented by one of our engineers.

4. The discovery was followed by the attempts of different scientists to explain it.

IV. Запишите предложения и подчеркните в них модальный глагол или его эквивалент. Переведите.

1. The mechanical shop of our plant was to be reconstructed.

2. He is a skilful worker who can operate practically any type of equipment.

3. Everyone working at an enterprise should know the essential safety rules.

4. In view of reconstruction works old machinery will have to be replaced within a month.

V. Запишите и переведите предложения, обращая внимание на разные значения слова *it*.

1. It is the country's natural wealth that determines the structure of its national economy.

2. It was proved that industrial wastes have a dangerous effect on the environment.

3. When the temperature had been measured it was written down in the table.

VI. Запишите и переведите предложения, обращая внимание на бессоюзные дополнительные и определительные придаточные предложения.

1. Many problems we are solving today have been caused by man's industrial activity.

2. Scientists believe this protective coating will withstand radiation without changing its properties.

VII. Прочитайте весь текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 2, 3 и 4.

JAMES CLERK MAXWELL

1. James Clerk Maxwell (1831-1879), a great physicist and mathematician, was born in Edinburg, Scotland. After school he entered the University of that city. Then he attended the University of Cambridge and graduated from it in 1854. When at the University Maxwell took great interest in mathematics and optics.

2. For two years after the University Maxwell worked at Trinity College combining lecturing and making experiments in optics. At the same time he studied much himself. He became a professor of natural philosophy (1856) and in some ten years a professor of physics and astronomy. When working at the King's College (London) he met Faraday for the first time.

3. In 1871 Maxwell became professor of experimental physics at Cambridge. At that time students could not have such subjects as

electricity or magnetism as there was no laboratory for studying them. Such a laboratory organized by Maxwell made Cambridge world-known.

4. This was a very fruitful period of Maxwell's life. He was engaged in studying the problems of electromagnetism, molecular physics, optics, mechanics and others. The most outstanding investigations, however, were made in the field of the kinetic theory of gases and electricity. Maxwell is called the founder of the electromagnetic field (together with Faraday) and the electromagnetic theory of light. His famous work on electricity and magnetism was published in 1873. During these years he also wrote his classic «Matter and Motion», a small book on a great subject, and many articles on other problems.

5. Maxwell wrote his first scientific work when he was fifteen. Since that time he published a great number of works based on the results of his experiments and calculations. Maxwell's works on the kinetic theory of gases, the theory of heat, dynamics and the mathematical theory of electricity and magnetism are monuments to his great genius.

VIII. Просмотрите 5-ю часть текста и закончите предложение *James Clerk Maxwell became a world-known scientist...*, выбрав вариант, соот-ветствующий его содержанию. Запишите и переведите полученное предложение.

1. ... because he developed theoretical principles of experimental physics.

2. ... because his scientific works were based on his own experiments.

3. ... because he published his first scientific work at the age of fifteen.

Вариант 5

I. Запишите и переведите предложения, обращая внимание на степени сравнения прилагательного и наречия.

1. A wider application of computers makes our labour easier and more efficient.

2. The newer the equipment, the higher is the productivity.

3. This book gives the most detailed explanation of various operations.

II. Запишите и переведите предложения, обращая внимание на значение неопределенных и отрицательных местоимений.

1. Will anybody analyze these data in your scientific laboratory?

2. Any industrial enterprise should provide safe labour conditions for workers.

3. These researchers are doing some important work at our plant.

III. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите, обращая особое внимание на перевод пассивных конструкций.

1. The commission will consider this offer carefully before accepting it.

2. Science and engineering make a wide use of synthetic materials in electronic instruments.

3. Before the experiment all the necessary computations were made by the engineers.

4. The results of this research work were often referred to by the professor.

IV. Запишите предложения и подчеркните в них модальный глагол или его эквивалент. Переведите.

1. You should try to find out as many facts as possible about history of engineering.

2. The team of experts is to analyze the present situation connected with the new industrial installation.

3. The young engineer was allowed to apply the mobile equipment in his field experiments.

4. This production process had to be further improved by new technical means.

V. Запишите и переведите предложения, обращая внимание на разные значения слова *it*.

1. It is known that the first automatic control system was installed 10 years ago.

2. It is our research center which leads in measures to reduce harmful industrial waste.

3. We pay great attention to the output quality; it is one of the most significant indications of productivity.

VI. Запишите и переведите предложения, обращая внимание на бессоюзные дополнительные и определительные придаточные предложения.

1. It is well-known electronics has made great progress over the last decades.

2. Amount of the pollutants the enterprises throw depends on the quality of purifying installations.

VII. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 2, 3 и 4.

JAMES WATT

1. James Watt (1736-1819), a Scottish inventor and mechanical engineer, is known for his improvements of the steam engine used at that time to pump out water from mines. He became interested in the engine of this type when working as an instrument-maker.

2. Watt determined the properties of steam, especially the relation of its density to its temperature and pressure, and designed a condensing chamber for the engine that prevented large losses of steam in the cylinder. Watt's first patent (1769) covered this device and some other improvements on steam engine.

3. For some years he was working together with John Roebuck, another inventor, financing Watt's researches. In 1775, however, Roebuck's interest was taken over by the manufacturer and the owner

of the Engineering (механический) Works at Birmingham. It was at this works where Watt and Roebuck began to manufacture steam engines.

4. Continuing his research Watt patented several other important inventions, including the rotary engine for driving various types of machinery, the double-action engine, and the steam indicator recording the steam pressure in the engine. Watt retired from the firm in 1800 and since that time he could devote himself entirely to research work.

5. The misconception that Watt was the actual inventor of the steam engine was because of his fundamental contributions to its development and improvement. The centrifugal governor invented by him in 1788, is of particular interest today. It is a device providing automatic regulation of the engine speed. It embodies the feedback principle of a servomechanism, linking output to input, which is the basic concept of automation. The *watt*, the unit of power, was named in his honor. Watt was also a well-known civil engineer. In 1767 by adapting telescopes he invented an attachment used in the measurement of distances.

VIII. Просмотрите 5-ю часть текста и ответьте на вопрос: *Do James Watt's numerous inventions belong to a single or to different areas of man's activity?* Запишите и переведите вопрос и ответ.

КОНТРОЛЬНАЯ РАБОТА № 2

Вариант 1

I. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите.

1. Great efforts have been undertaken in the area of the environment protection.

2. They could not solve the problem without applying digital computers.

3. The development of automatic control systems is being paid much attention to.

4. The worker was told to increase the pressure up to 25 atmospheres.

II. Запишите и переведите предложения, обращая внимание на функцию инфинитива (Infinitive).

1. Throughout human history man has invented tools, machines, materials and techniques to make his life easier.

2. To explain this process the engineer was to demonstrate some schemes, tables and diagrams.

3. To reduce pollutants from enterprises, industry was forced to change combustion processes and to add controllers.

4. The properties of raw material to be used for production are being carefully studied.

III. Перепишите и переведите предложения, содержащие субъектный и объектный инфинитивные обороты, инфинитив в функции определения.

1. The damage is considered to be the result of the personnel's mistakes.

2. Long ago researchers believed minerals to be an immense and inexhaustible source of energy.

3. New technologies to be developed at our plant will replace the old ones.

IV. Запишите предложения. Выпишите из них причастия, укажите их вид (Participle I или Participle II) определите их самостоятельную функцию (определение или обстоятельство). Переведите.

1. The students studying at Kuzbass Technical University are to have practical training at various industrial enterprises.

2. When asked about the plan the chief engineer said that it had been fulfilled in time.

3. Working on the device in the laboratory, the engineers were regularly testing it at the plant.

4. Ultrasonic techniques used in industry opens wide possibilities for the automatic control.

V. Перепишите и переведите предложения, содержащие зависимый и независимый (самостоятельный) причастные обороты.

1. When produced goods are transmitted to the consumer.
2. The Industrial Revolution having been started, engineers have contributed to the development of a wide range of technologies.
3. Progress in the development of industrial robotics has been so rapid that today electronics is applied in many mining processes.
4. Measuring the magnetic field on the Earth's surface the scientists formed an idea about the nature of the Earth's magnetism.

VI. Перепишите и переведите предложения, содержащие условные предложения и сослагательное наклонение.

1. It will be impossible to apply new technology if there is no proper equipment.
2. The chief engineer would have done more for the development of the plant, if he had had much experience.
3. It would be wrong to suppose that the usage of automatic devices is the only way to improve industrial processes.

VII. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 2 и 3.

THERMOELECTRIC CIRCUIT

1. Let us now construct a thermoelectric circuit to generate an electric current. We take two semiconductors of opposite types, an n-type and a p-type, and join them at their hot ends. Between their cold ends we place a conductor through which we wish to pass a current. This conductor may be the armature of an electric motor, a lamp, an electrolytic bath to reduce aluminium, or any other device using an electric current.

2. Let us assume that a high temperature is maintained at the hot junction, and that the cold ends of the semiconductors are maintained at a lower temperature. The current produced in the n-type semiconductor flows from the hot to the cold end, while that in the p-type semiconductor flows from the cold end to the hot. The current thus flows around the whole circuit, including the electrical device.

Such a thermoelectric cell, it is true, yields only 10ths of a volt, e. g. the 100 to 200 volts used in the home. To obtain these voltages in a thermoelectric generator we need only join hundreds of individual thermoelectric cells together.

3. The quality of a thermoelectric cell, however, is not only determined by the voltage it will produce. Two other factors must be taken into account: its electrical and thermal conductivity. If the voltage it produces is to be delivered as useful current, then it must have high electrical conductivity.

4. On the other hand, if a thermoelectric cell is to convert a high percentage of the heat energy into electrical energy, it must have low thermal conductivity. The principal deficiency of thermoelectric cells, as contrasted with other heat engines, is that most of the heat supplied to the hot end flows directly and wastefully by heat conduction, to the cold end. Thus the ratio between the useful electrical output and the heat input in a thermoelectric cell is low.

VIII. Просмотрите 4-ю часть и ответьте на вопрос: *What is the principal deficiency of thermoelectric cells?* Запишите и переведите вопрос и ответ.

Вариант 2

I. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите.

1. This phenomenon is always being studied with great interest.

2. We expect that the technology used at our plant will have been greatly improved.

3. Every society is affected by the level of its industrial development.

4. The man testing the engine belongs to the team responsible for the equipment.

II. Запишите и переведите предложения, обращая внимание на функцию инфинитива (Infinitive).

1. Computer-aided monitoring systems are used to detect the damages of equipment.

2. To gain control over nature means to know its laws and not to break them.

3. In order to achieve the higher level of quality, the new assembly lines have to be mounted.

4. The method to be introduced at our plant was developed some years ago and proved very efficient.

III. Перепишите и переведите предложения, содержащие субъектный и объектный инфинитивные обороты, инфинитив в функции определения.

1. Efficiency of the turbines to be used at our enterprise is about 95 per cent.

2. Einstein is known to have formulated the theory of relativity which is used to explain practically all physical phenomena.

3. Specialists know the resistance of metals to depend on their temperature.

IV. Запишите предложения. Выпишите из них причастия, укажите их вид (Participle I или Participle II) определите их самостоятельную функцию (определение или обстоятельство). Переведите.

1. The students studying at the Kuzbass Technical University are to have practical training at various industrial enterprises.

2. When asked about the plan the chief engineer said that it had been fulfilled in time.

3. Working on the device in the laboratory, the engineers were regularly testing it at the plant.

4. Ultrasonic techniques used in industry open wide possibilities for the automatic control.

V. Перепишите и переведите предложения, содержащие зависимый и независимый (самостоятельный) причастные обороты.

1. Major principles of electronics having been developed, scientists and engineers put them into practice.

2. When discussing the plan of development the engineers decided to divide it into some stages.

3. We know that modern industrial enterprises are the plants producing a great amount of output goods.

4. Spare parts produced in our region are supplied to various districts of the country.

VI. Перепишите и переведите предложения, содержащие условные предложения и сослагательное наклонение.

1. If the recent inventions had not been made further development of electronics would have been stopped.

2. It will be an interesting research paper if you describe the results of your recent experiment.

3. The properties of this material will be greatly improved if it is treated with the use of advanced technologies.

VII. Прочитайте весь текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 2, 3 и 4.

THERMOELECTRIC GENERATOR

1. Efficiency is an important characteristic of a machine, but it is not the only one. In order to obtain electrical energy from a steam engine, one must construct a furnace, a condenser, a steam boiler, a steam engine, and a dynamo. This is complex and expensive equipment. A thermoelectric generator requires only a heater and a cooler; it has no moving parts. In many cases this advantage may more than compensate for lower efficiency, especially since an efficiency of 30 per cent can be obtained only from very powerful steam turbines. The efficiency of small steam engines may be as low as 10 per cent.

2. For small power requirements, when one needs merely a few kilowatts of electricity, thermoelectric generators can compete with steam engines. For very low power requirements (as in radio, telegraph, and telephone communications) thermoelectric generators provide the best engineering solution. And we must remember also that an efficiency of 10 per cent is not the limit for thermoelectric generators. The efficiency will increase significantly if one is able to go on to higher temperatures. If the temperature of the hot end could

be raised to 600 degrees Centigrade, for instance, the efficiency would go up to 18 per cent.

3. Even at their present efficiencies, however, thermoelectric generators are rendering effective practical service at many places that otherwise would be deprived of electric power. A thermoelectric generator can obtain from the heat of an ordinary kerosene lamp enough electrical energy to power a radio receiving-set.

4. Let us now consider thermoelectric solar generators. Calculations and preliminary experiments indicate that small thermoelectric units are entirely feasible, even allowing for the cost of the large steerable mirrors necessary to concentrate the sunlight. Such units could be used to pump water from underground wells and irrigate desert land.

VIII. Просмотрите 1-ю часть и ответьте на вопрос: *What equipment should be available in order to obtain electrical energy from a steam engine?* Запишите и переведите вопрос и ответ.

Вариант 3

I. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите.

1. They will start the construction of the new industrial enterprise in a month.

2. The chief engineer was informed of the changes made in the production cycle.

3. Scientists of different countries were working hard to improve industrial technologies.

4. The results of the experiment could not be relied upon because of some fault in the engine.

II. Запишите и переведите предложения, обращая внимание на функцию инфинитива (Infinitive).

1. Our intention was to expand the production and to increase the output of energy by 20 per cent.

2. The technologies to be used in this industry were being developed for several years.

3. To explain the problem the professor mentioned some facts from his life.

4. People use discoveries to satisfy their needs and to improve the environment they live in.

III. Перепишите и переведите предложения, содержащие субъектный и объектный инфинитивные обороты, инфинитив в функции определения.

1. The annual decrease of quality was found to be significant enough to start the reconstruction of the plant.

2. It is one of the main discoveries to have been made by man in the 21st century.

3. The engineers affirm the cost of production to be determined by the efficiency of industrial equipment.

IV. Запишите предложения. Выпишите из них причастия, укажите их вид (Participle I или Participle II) и определите их самостоятельную функцию (определение или обстоятельство). Переведите.

1. It has taken the engineers three years to complete the experiment.

2. The problem discussed at the conference is of vital importance for our region.

3. When studying damages the scientists found that they could be caused by several factors.

4. If used for electricity generation, coal is usually pulverized and then combusted in a furnace with a boiler.

V. Перепишите и переведите предложения, содержащие зависимый и независимый (самостоятельный) причастные обороты.

1. While experimenting with different materials scientists wanted to find some cheap and efficient source of energy.

2. In all enterprises visited new electronic means of controlling are used.

3. The removal of pollution from environment for its general protection is called the environmental remediation.

4. Ultrasonic techniques having been widely introduced into industry, we could automate a lot of processes.

VI. Перепишите и переведите предложения, содержащие условные предложения и сослагательное наклонение.

1. Engineers would be unable to apply this technique without the use of new machinery.

2. If a problem is studied carefully its solution will be found quicker.

3. If the generator had not been installed, the enterprise would have never been supplied with electricity.

VII. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 3, 4.

THE RECIPROCATING STEAM ENGINE

1. In the earlier days the primary engine to transform the steam's heat energy to mechanical energy was done using a piston within a sealed housing. Valves in the sealed housing would allow steam to enter into the chamber; the steam restricted by the sealed housing would push on the piston, forcing it down. This downward motion of the piston was transmitted to the crankshaft by a connecting rod.

2. Triple Expansion Steam Engine was very common at the earlier part of the 20th century. The Famous Titanic had two similar engines, except the Titanic's had an additional stage. They were known as quadruple expansion engine and operated on the same principle.

3. The first time, where the steam has the most energy, the valve allows it to enter the small cylinder, on the topside of the piston. The expansion (pressure) of the steam pushes down on the area of the piston, rotating the crankshaft. The steam is then released by ports, near the end of its stroke. The steam is then directed to the following cylinder. Here for a second time, by way of a valve, the steam enters the medium size cylinder and exert its pressure on the area of the piston forcing it down.

4. Finally, with most of the energy already spent, the steam enters the third and final stage of the engine as it did in the two

previous stages. The steam enters the large diameter cylinder, pushes down the piston and exits the engines. The steam is then collected in a vacuum environment called a condenser, where the remaining heat in the steam is dispelled and changes state, back to being water. The water is then fed, or recycled, as feedwater for the boiler.

5. The pistons of this engine are called double acting, which means that, not only does the piston get «pushed down» but it also gets «pushed up». So steam enters the top of the piston, pushes it down, then the valve allows steam to enter the bottom of the piston, pushing it up.

VIII. Просмотрите 2-ю и 5-ю части и ответьте на вопрос: *Why the pistons of the engine are called double acting?* Запишите и переведите вопрос и ответ.

Вариант 4

I. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите.

1. Experts in modern technologies have been shown some types of new synthetic materials.

2. Recycling helps to prevent waste of potentially useful materials.

3. The results of calculation are greatly influenced by the method of calculation.

4. The operator had to replace only one part in that device.

II. Запишите и переведите предложения, обращая внимание на функцию инфинитива (Infinitive).

1. The temperature to be measured with this thermometer cannot be lower than 50 degrees Centigrade.

2. The aim of the chief engineer is to control all the stages of production cycle.

3. To make accurate measurements several parameters must be known.

4. To fulfil these operations is impossible without modern machinery.

III. Перепишите и переведите предложения, содержащие субъектный и объектный инфинитивные обороты, инфинитив в функции определения.

1. Everyone knows the startup of new plant to have been postponed because of the accident.

2. These electronic instruments are supposed to be able to solve complex logical problems.

3. The material to be tested in our laboratory will be used for many industrial purposes.

IV. Запишите предложения. Выпишите из них причастия, укажите их вид (Participle I или Participle II) и определите их самостоятельную функцию (определение или обстоятельство). Переведите.

1. When put into operation the plant had much less capacity.

2. Designing new machines the engineers should pay attention to the environmental standards.

3. The discussion was going on with greater intensity.

4. The results received will be of great importance for their further work.

V. Перепишите и переведите предложения, содержащие зависимый и независимый (самостоятельный) причастные обороты.

1. Being studied intensively by specialists of different branches this material has quickly found wide-scale application.

2. The type of equipment used depended on production purposes.

3. The recent inventions having been made, they allowed the new methods of production to be developed.

4. Engineers are the scientists applying scientific knowledge to develop solutions for technical, social and economic problems.

VI. Перепишите и переведите предложения, содержащие условные предложения и сослагательное наклонение.

1. If the accident had been studied carefully, it would not have happened again.

2. Without application of electronic equipment this manufacturing process would be impossible.

3. If modern engineers didn't have enough knowledge in different fields of science they would be unable to solve complex industrial problems.

VII. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 2 и 4.

BOILERS

1. Water in the form of steam has the ability to store great amounts of energy. Within the boiler, fuel and air are forced into the furnace by the burner. There, it burns to produce heat. From there, the heat (flue gases) travels throughout the boiler. The water absorbs the heat enough to change into a gaseous state steam.

2. Water Tube Boiler looks very complicated. Thousands of tubes are placed in strategic location to optimize the exchange of energy from the heat to the water in the tubes. These types of boilers are most common because of their ability to deliver large quantities of steam. The large tube like structure at the top of the boiler is called the steam drum. You could call it the heart of the boiler. That's where the steam collects before being discharged from the boiler. The hundreds of tubes start and eventually end up at the steam drum.

3. Water enters the boiler, preheated, at the top. The hot water naturally circulates through the tubes down to the lower area where it is hot. The water heats up and flows back to the steam drum where the steam collects. Not all the water gets turned to steam, so the process starts again. Water keeps on circulating until it becomes steam. Meanwhile, the control system is taking the temperature of the steam drum, along with numerous other readings, to determine if it should keep the burner burning, or shut it down.

4. Three pass type fire tube boiler. Heat – flue gases – travels through three different sets of tubes. All the tubes are surrounded by water which absorbs the heat. As the water turns to steam, pressure builds up within the boiler, once enough pressure has built up the engineer will open main steam outlet valve slowly, supplying steam for service. Fire tube boilers are also known as «smoke tube» and «donkey boiler».

VIII. Просмотрите 3-ю часть и ответьте на вопрос: *Why Water Tube Boiler is the most common type of boilers?* Запишите и переведите вопрос и ответ.

Вариант 5

I. Запишите предложения. Выпишите из них сказуемые, определите их видо-временные формы и залог. Переведите.

1. The scientist was speaking of the new instruments used for improving several industrial processes.

2. The situation in the sphere of environment protection is regularly reported in the regional paper.

3. Industries make a wide use of raw minerals for producing various goods.

4. The participants of the conference were told about the latest achievements of their foreign colleagues.

II. Запишите и переведите предложения, обращая внимание на функцию инфинитива (Infinitive).

1. Now it is commonplace to use computer-aided design programs when designing engineering systems.

2. One can use different means to measure high temperatures.

3. The machine to be inspected by the operator is located in the mechanical shop of our plant.

4. To design and develop automatic control systems is the responsibility of an engineer.

III. Перепишите и переведите предложения, содержащие субъектный и объектный инфинитивные обороты, инфинитив в функции определения.

1. This automatic device is known to have been invented about 50 years ago.

2. The designers believe their new apparatus to be able to maintain a desired production rate for a long time.

3. There are a great many of interesting things to be said about engineering.

IV. Запишите предложения. Выпишите из них причастия, укажите их вид (Participle I или Participle II) и определите их самостоятельную функцию (определение или обстоятельство). Переведите.

1. Doing the research you must follow the recommendations given in this handbook.

2. The figures mentioned in his report will be published in the next issue of this scientific journal.

3. When measured the voltage was much higher than it was expected.

4. The experiment marking the beginning of new research area was made by our scientists.

V. Перепишите и переведите предложения, содержащие зависимый и независимый (самостоятельный) причастные обороты.

1. Having applied new methods of research the scientists obtained the desired results.

2. Environmental protection measures being of great importance for modern society, they are undertaken in various industries.

3. The industrial enterprises being built near the Arctic Circle are to use a special technological scheme.

4. Most of the electricity used is produced by means of generators.

VI. Перепишите и переведите предложения, содержащие условные предложения и сослагательное наклонение.

1. An enterprise will not be placed in operation if there is no equipment for waste utilisation.

2. The chief engineer would have done more for the development of the plant, if he had had much experience.

3. It would be impossible to supply far-off regions with qualified engineers without establishing new higher educational institutions.

VII. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 2 и 3.

TURBINES

1. A turbine is a machine that converts the energy stored in a fluid into mechanical energy. This conversion is generally accomplished by passing the fluid through a system of stationary passages of vanes that alternate with passages consisting of finlike blades attached to a rotor. By arranging the flow so that a tangential force, or torque, is exerted on the rotor blades, the rotor will turn, and work can be extracted.

2. Turbines can be classified into four general types according to the fluids used: water, steam, gas, and wind. Although the same principles apply to all turbines, their specific designs differ sufficiently to merit separate descriptions.

3. A water turbine uses the potential energy resulting from the difference in elevation between an upstream water reservoir and the turbine-exit water level (the tailrace) to convert this so-called head into work. Water turbines are the modern successors of simple waterwheels which date back about 2,000 years. Today, the primary use of water turbines is for electric power generation.

4. The greatest amount of electrical energy comes, however, from steam turbines coupled to electric generators. The turbines are driven by steam produced in either a fossil-fuel-fired or a nuclear-powered generator. The energy that can be extracted from the steam is conveniently expressed in terms of the enthalpy change across the turbine.

5. Enthalpy reflects both thermal and mechanical energy forms in a flow process and is given by the sum of the internal thermal energy and the product of pressure times volume. The available enthalpy change through a steam turbine increases with the temperature and pressure of the steam generator and with reduced turbine-exit pressure.

VIII. Просмотрите 4-ю и 5-ю часть и ответьте на вопрос: *When does the available enthalpy change through a steam turbine increase?* Запишите и переведите вопрос и ответ.