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АНГЛИЙСКИЙ ЯЗЫК

Методические указания к контрольным работам для студентов заочной формы обучения

Рекомендовано учебно-методической комиссией направления 15.03.05 «Конструкторско-технологическое обеспечение машиностроительных производств» в качестве электронного издания для самостоятельной работы

Кемерово 2016

Рецензент:

Рецензент
Зникина Л. С. – зав. кафедрой иностранных языков КузГТУ, профессор, доктор пердагогичсеких наук

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Английский язык: методические указания к контрольным работам для студентов направления подготовки 15.03.05 «Конструкторско-технологическое обеспечение машиностроительных производств» 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 способностью использовать один из иностранных языков на уровне не ниже разговорного.

Предисловие

Цель указаний – формирование у студентов такой общекультурной компетенции, как способностью использовать один из иностранных языков на уровне не ниже разговорного.

Упражнения и задания, представленные в контрольных работах, направлены на обеспечение практического владения студентами английским языком на уровне умения самостоятельного чтения и понимания литературы по направлению подготовки. Сопутствующая задача – обеспечить корректировку и выравнивание уровня знаний, умений и навыков студентов заочной формы обучения, 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:

Семестр	***Номер контрольной работы, подлежащей выполнению***
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 предъявлемых 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. Прослушивание аудиотекста на иностранном языке длительностью звучания до 2-х минут (предъявление двукратное) и выполнение тестовых заданий по его содержанию. Время выполнения 10 минут (Listening comprehension).

2. Письменный перевод оригинального текста по широкому или узкому профилю специальности с использованием словаря, 1200-1500 п. зн. / 45 мин(Written translation).

3. Пересказ или аннотация на русском или английском языке несложного оригинального текста по специальности объёмом 2000 п. зн., на чтение которого без словаря отводится 10 мин. Время на подготовку – 5-7 мин. (Reading comprehension)

4. Сообщение на предложенную из числа изученных тем (15-20 фраз, время подготовки – 5 мин), ответы на вопросы экзаменаторов; ситуативный диалог с партнёром (Speaking):

- *Роль английского языка в мире.*
- *Образование в России.*
- *КузГТУ.*
- *Кузбасс. Промышленность Кузбасса.*
- *Машиностроение. Отрасли инженерии.*
- *Металлы и их свойства.*
- *Обработка металлов.*
- *Металлообрабатывающие станки и процессы.*

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 весь 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 Novisibirsk. 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 весь 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 часть 3 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 fulfiled 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, соответствующий 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 engi-neer, 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 in-ventions, 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. Прочитайте весь текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 2 и 3.

ENVIRONMENTAL PROBLEMS

1. Overpopulation, pollution and energy consumption have created such planet-wide problems as massive deforestation, acid rains and the global warming connected with the 'greenhouse effect'.

2. The seas filled with poison – industrial and nuclear wastes as well as chemical substances – are in danger. The Mediterranean Sea is already nearly dead, the next are the North and the Aral ones. Scientists say every ten minutes one kind of animal, plant or insect dies out for ever. If nothing is done, one million species that are alive today will disappear in twenty years from now, nothing will be able to live in them.

3. A very serious problem is air pollution. We know industrial enterprises emit tons of harmful substances. Being the main reason for the greenhouse effect and acid rains these emissions have disastrous consequences for the whole planet. Of special danger is carbon dioxide (CO_2) working as follows: it lets the sunlight in but does not let the heat out. In Cairo even to breathe the air is life threatening. One may say the same of Mexico City and 600 cities of the former Soviet Union. An even greater environmental threat is presented by atomic power stations. Everyone knows the consequences of the Chernobyl and other atomic stations' tragedies.

4. The poisoning of the Earth's land, air, and water results in the fast-spreading disease of civilization. It is probably not less dangerous

than wars, earthquakes and floods; it is one of history's greatest dangers to human life. If present trends continue for the next several decades, our planet will become uninhabitable. Understanding that environmental problems are their own problems people are beginning to join and support various international organizations and green parties.

VII. Просмотрите 4-ю часть и ответьте на вопрос: *Why does the author compare the planet's pollution with wars, earthquakes and floods?* 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 fulfiled 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.

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

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

WATER AND AIR POLLUTION

1. We cannot live without water and air, the pollution of which is the factor destroying the environment in big cities. Even Paris where there is no heavy industry is to protect its water resources. The problem is being solved by building pollution-control stations. To clean the water from admixtures and gases before it goes into the water supply systems both mechanical and biological means have to be used. The atmosphere is polluted mainly by heating systems and cars. Smoke from factories and cars in combination with natural fog forms smog which is recognised as a potential cause of death.

2. It is known that factories and transportation have to burn huge amounts of fuel: billions of tons of coal and oil are consumed around the world every year. When burning these fuels throw off smoke and other by-products into the atmosphere. The accumulation of pollution is a serious threat to humans and the environment. To protect the air it is necessary to switch industry to more clean fuels than coal or oil.

3. Some scientists are of the opinion that at present the world's number one polluter is the car. The production of one car results in 1,500 kilos of waste and 75 million cubic metres of polluted air. Taking into account that there are now about 500 million cars on Earth it is impossible to estimate a quantity of pollution. Even when you throw the car away it is still polluting the earth with dangerous metals (like cadmium) and other chemicals. Moreover, to drive a car you need roads, motorways and car parks the construction of which also produces a large quantity of pollution.

4. A wide understanding of the pollution threat dates from 1950s but still little has been done by man in the area of environmental protection.

VII. Просмотрите 1-ю часть и ответьте на вопрос: *Is the protection of air as important for man as that of water and why?* 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 efficienr 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. Прочитайте весь текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 4 и 5.

WATER POLLUTION

1. City growth has always concentrated in the areas near some water supply – rivers, canals, lakes, seas and oceans – because man cannot live without water. The greater is the number of population, the more water it needs. The increase in water consumption on the planet may result in a water shortage in the near future.

2. Since the beginning of civilization, water has been used to carry away different kinds of wastes and garbage. Water has the capacity to dissolve many substances. When dissolved these

substances are less dangerous to the environment than metals or plastics. Nevertheless, remaining in the water they can make it poisonous for many forms of life.

3. Huge consumers and polluters of water are industry and agriculture. It has been estimated that about 85 per cent of the water is consumed by industry. To manufacture a ton of paper it needs 100, and a ton of synthetic fibers – from 2,500 to 5,000 cubic meters of water.

4. Industrial and agricultural development is accompanied with the increasing amount of waste materials. It should be mentioned that rivers and lakes are also used as transportation routes, fishing and recreation areas. As a result, more and more waterways are becoming polluted. Lakes are especially affected by pollution because they cannot cleanse themselves as rapidly as rivers or oceans. The wastes are the «food» for water plants which, when growing, reduce the amount of open water and result in drying up of a lake.

5. People have long recognized that we all depend upon the earth environment. But to understand the problem is not to solve it. So, some decisive measures have to be taken to protect the earth's wonderful and complex environment system which is so easily damaged by man's activity.

VII. Просмотрите 2-ю и 3-ю части и ответьте на вопрос: *How many sources of water pollution are mentioned there and what are they?* 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 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. Прочитайте весь текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1, 2 и 4.

SOURCES OF ATMOSPHERIC POLLUTION

1. There are natural and artificial sources of atmospheric pollution. The former include active volcanoes, dust storms, forest fires and some other factors. Artificial sources appeared due to the development of cities and industry. Because of its heating system every industrial enterprise as well as automobile pollutes the atmosphere and influences the local climate. Scientists have established that the larger is the population of an urban area, the greater is the level of air pollution.

2. Any industrial process is accompanied with emission of dangerous gases and industrial dust. Daily emission of an electric power plant, for example, burning 2,000 tons of coal a day, is about 400 tons of SO_2 gas. One can name such great air polluters as thermal power stations, metallurgical, chemical, cement and many other plants.

3. A very serious source of atmospheric pollution is the automobile. Being a very convenient means of transportation, the automobile at the same time emits huge amounts of fumes. To make them less toxic special measures have to be taken. We know engineers are working at such problems as development of more efficient carburetors and less toxic fuels, neutralization of fumes, development of electric automobiles and others.

4. The problem of atmospheric pollution by radioactive elements dates back to the atomic bombs dropped on the Japanese cities (1945). Although released into the atmosphere, the radioactive products fall on the earth, spreading over many kilometers. That is why we face a global «Man and the Biosphere» problem which cannot be solved by the efforts of any one country.

VII. Просмотрите 3-ю часть и ответьте на вопрос: *What are the main advantage and disadvantage of the automobile?* 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 collegues.

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

RATIONAL USE OF NATURAL RESOURCES

1. The problem of rational use of natural resources is closely connected with environmental protection. Today industrially developed countries extract about 30 tons of minerals a year for each person, but only 1.0-1.5 per cent of them are consumed in different products. So, man's economic activity results in huge amounts of wastes polluting the atmosphere, water resources, soil.
2. Further increase in world population needs the development of industry which is impossible without development of new deposits

of natural resources. As we deplete the existing deposits, we begin to exploit the deeper ones, those lying at greater depths of the earth. Scientists are working at the technical aspects of their development. But one should remember that the exploitation of one resource must not affect and damage the others.

3. To meet our needs new materials are created by industry every year. According to the statistics 40,000 chemical substances produced are dangerous for the human organism. New chemicals and types of energy as well as physical radiations give rise to new diseases. Moreover, the production of each new substance is accompanied by new wastes.

4. To decrease these wastes is, first of all, to improve the efficiency of using natural resources. Everyone knows that coal, oil and gas are not only energy sources but raw materials for valuable chemicals. Oil is used to produce petrol, kerosene, masut, paraffin and other substances. Natural gas is a raw material for plastics and fertilizers. Thus, we are to produce as many different substances from each mineral as possible.

5. Rational use of natural resources providing their conservation is an integral part of the society's development. A huge work has been done in this direction but still more is to be done.

VII. Просмотрите 4-ю и 5-ю части и ответьте на вопрос: *What should be done to achieve 'rational use' of natural resources?* Запишите и переведите вопрос и ответ.

КОНТРОЛЬНАЯ РАБОТА № 3

Вариант 1

I. Перепишите и переведите предложения, обращая внимание на различные значения глаголов *should, would*.

1. The engineer's assistant should regularly control the state of machinery.

2. Engineers would be unable to calculate and correct the action of machinery without electronic computers.

3. If you came to our enterprise next week, we should show you our new equipment.

II. Перепишите и переведите предложения, обращая внимание на инфинитивные и причастные обороты, которым в русском языке обычно соответствуют придаточные предложения.

1. The choice of the material to be used depends upon many factors.

2. M. Lomonosov is known to have pointed out that minerals undergo constant changes.

3. There being no higher schools specializing in engineering, the number of engineers in pre-revolutionary time was very small.

4. We believe this process to be introduced on a wide scale in two decades.

5. If improved this technique may be used to manufacture modern machinery.

III. Перепишите и переведите предложения, обращая внимание на значения выделенных слов и словосочетаний.

1. The information of this article is interesting *as well as* useful for our research.

2. We had to replace the device used *for* inputting data to the computer *for* it had some drawbacks.

3. *As* a designer he should know *both* the advantages *and* disadvantages of the material used for his project.

IV. 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.

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

MECHANICAL ENGINEERING

1. The engineering field requires an understanding of core concepts including mechanics, kinematics, thermodynamics, materials science, and structural analysis. Mechanical engineers use these core principles along with tools like computer-aided engineering and product lifecycle management to design and analyze manufacturing plants, industrial equipment and machinery, heating and cooling systems, transport systems, aircraft, watercraft, robotics, medical devices and more.

2. Mechanical engineers typically use mechanics in the design or analysis phases of engineering. If the engineering project were the design of a vehicle, statics might be employed to design the frame of the vehicle, in order to evaluate where the stresses will be most intense. Dynamics might be used when designing the car's engine, to evaluate the forces in the pistons and cams as the engine cycles.

3. Mechanics of materials might be used to choose appropriate materials for the frame and engine. Fluid mechanics might be used to design a ventilation system for the vehicle, or to design the intake system for the engine.

4. Mechanical engineering overlaps with aerospace engineering, building services engineering, civil engineering, electrical engineering, petroleum engineering, and chemical engineering to varying amounts.

VI. Прочитайте 2-ю часть текста и ответьте на вопрос: *What do we call the computers which are developed for doing a variety of jobs?* Запишите и переведите вопрос и ответ.

Вариант 2

I. Перепишите и переведите предложения, обращая внимание на различные значения глаголов *should, would*.

1. If he knew that the test was dangerous he would take some special measures.

2. It should be mentioned that nearly everything that we do in the modern world is helped, or even controlled, by computers.

3. It would be impossible for the engineers to examine the machines' damages without the help of special equipment.

II. Перепишите и переведите предложения, обращая внимание на инфинитивные и причастные обороты, которым в русском языке обычно соответствуют придаточные предложения.

1. The chief engineer wanted his team to install the device next week.
2. All the details having been discussed, they decided to test the new method.
3. Computers to be used for controlling the production will be delivered in a month.
4. When tested the new equipment showed capacity which the previous one did not possess.
5. Everyone knows engineers to master new methods of generating energy.

III. Перепишите и переведите предложения, обращая внимание на значения выделенных слов и словосочетаний.

1. Operation began *as* soon *as* the machines had been installed.
2. Coal is extracted *both* in mines *and* in quarries; *either* of these methods is being widely used in our region.
3. *Because of* its tiny size this computer is called *either* minicomputer *or* microcomputer.

IV. 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.

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

MECHATRONICS

1. Mechatronics is an interdisciplinary branch of mechanical engineering, electrical engineering and software engineering that is concerned with integrating electrical and mechanical engineering to create hybrid systems. In this way, machines can be automated through the use of electric motors, servo-mechanisms, and other electrical systems in conjunction with special software.

2. A common example of a mechatronics system is a CD-ROM drive. Mechanical systems open and close the drive, spin the CD and move the laser, while an optical system reads the data on the CD and converts it to bits. Integrated software controls the process and communicates the contents of the CD to the computer.

3. Robotics is the application of mechatronics to create robots, which are often used in industry to perform tasks that are dangerous, unpleasant, or repetitive. These robots may be of any shape and size, but all are preprogrammed and interact physically with the world. To create a robot, an engineer typically employs kinematics (to determine the robot's range of motion) and mechanics (to determine the stresses within the robot).

4. Robots are used extensively in industrial engineering. They allow businesses to save money on labor, perform tasks that are either too dangerous or too precise for humans to perform them economically, and to ensure better quality. Many companies employ assembly lines of robots, especially in automotive industries and some factories are so robotized that they can run by themselves.

VI. Прочитайте 1-ю часть текста и ответьте на вопрос: *Why is mechatronics an interdisciplinary branch?* Запишите и переведите вопрос и ответ.

Вариант 3

I. Перепишите и переведите предложения, обращая внимание на различные значения глаголов *should, would*.

1. It would be impossible to fulfil this task if we did not take into consideration the results of the last experiment.

2. Without lighting equipment we should be able to work only during daylight hours.

3. Automation should cover most of the production processes in various branches of industry.

II. Перепишите и переведите предложения, обращая внимание на инфинитивные и причастные обороты, которым в русском языке обычно соответствуют придаточные предложения.

1. When supplied with good raw material the plant has greatly improved the quality of its products.

2. Minerals are considered to have been formed on the Earth millions of years ago.

3. We know industrial activities to affect environment.

4. The electronic devices having improved the control, we could ensure regular production processes.

III. Перепишите и переведите предложения, обращая внимание на значения выделенных слов и словосочетаний.

1. When there is sound there is movement *as* all sounds are produced by something that vibrates.

2. *As* the work was progressing the team of researchers was achieving better results *because* they applied new and precise instruments.

3. *As for* this installation it did not operate *because of* poor fuel.

IV. 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.

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

STRUCTURAL ANALYSIS

1. Structural analysis is the branch of mechanical engineering (and also civil engineering) devoted to examining why and how objects fail and to fix the objects and their performance. Structural failures occur in two general modes: static failure and fatigue failure. Static structural failure occurs when, upon being loaded (having a force applied) the object being analyzed either breaks or is deformed plastically, depending on the criterion for failure.

2. Fatigue failure occurs when an object fails after a number of repeated loading and unloading cycles. Fatigue failure occurs because of imperfections in the object: a microscopic crack on the surface of the object, for instance, will grow slightly with each cycle (propagation) until the crack is large enough to cause ultimate failure.

3. Failure is not simply defined as when a part breaks, however; it is defined as when a part does not operate as intended. Some systems, such as the perforated top sections of some plastic bags, are designed to break. If these systems do not break, failure analysis might be employed to determine the cause.

4. Structural analysis is often used by mechanical engineers after a failure has occurred, or when designing to prevent failure. Engineers often use online documents and books such as those published by ASM (American Society for Metals) to aid them in determining the type of failure and possible causes. Structural analysis may be used in the office when designing parts, in the field to analyze failed parts, or in laboratories where parts might undergo controlled failure tests.

VI. Прочитайте 2-ю часть текста и ответьте на вопрос: *When does fatigue failure occur?* Запишите и переведите вопрос и ответ.

Вариант 4

I. Перепишите и переведите предложения, обращая внимание на различные значения глаголов *should, would*.

1. The chief engineer said that new apparatus would be tested in a week.

2. If they had studied the problem in detail they would have explained this phenomenon earlier.

3. This installation should produce much more output than the previous one.

II. Перепишите и переведите предложения, обращая внимание на инфинитивные и причастные обороты, которым в русском языке обычно соответствуют придаточные предложения.

1. The engine being based on a quite new principle, the operator could not start it.

2. The data to be published in this magazine were found in our experimental work.

3. Engineering is known to comprise various activities concerning science and technology.

4. We expected our research to reveal the secret of this phenomenon.

5. When founded the University was named after the famous Russian scientist.

III. Перепишите и переведите предложения, обращая внимание на значения выделенных слов и словосочетаний.

1. *As* a vector this parameter has direction *as well as* magnitude.

2. It is a well-known fact that gases have *neither* size *nor* shape of their own; liquids do not have them *as well*.

3. They could not start the construction *for* the water level was falling *for* more than a week.

IV. 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 diffrenet fields of science they would be unable to solve complex industrial problems.

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

MECHANICAL ENGINEERING

1. Mechanical engineering emerged as a field during the industrial revolution in Europe in the 18th century; however, its development can be traced back several thousand years around the world. Mechanical engineering science emerged in the 19th century as a result of developments in the field of physics. The field has continually evolved to incorporate advancements in technology, and mechanical engineers today are pursuing developments in such fields as composites, mechatronics, and nanotechnology.

2. Mechanical engineering overlaps with aerospace engineering, building services engineering, civil engineering, electrical engineering, petroleum engineering, and chemical engineering to varying amounts.

3. Mechanics is, in the most general sense, the study of forces and their effect upon matter. Typically, engineering mechanics is used to analyze and predict the acceleration and deformation (both elastic and plastic) of objects under known forces or stresses.

4. Subdisciplines of mechanics include:

- statics, the study of non-moving bodies under known loads, how forces affect static bodies;
- dynamics (or kinetics), the study of how forces affect moving bodies;
- mechanics of materials, the study of how different materials deform under various types of stress;
- fluid mechanics, the study of how fluids react to forces;
- kinematics, the study of the motion of bodies (objects) and systems (groups of objects), while ignoring the forces that cause the motion.

VI. Прочитайте 1-ю часть текста и ответьте на вопрос: *When did mechanical engineering science emerge?* Запишите и переведите вопрос и ответ.

Вариант 5

I. Перепишите и переведите предложения, обращая внимание на различные значения глаголов *should, would*.

1. Scientists should calculate the exact values by means of computer devices.
2. If they used carbon, the new alloy would possess some special properties.
3. Scientists supposed that this experiment would give something fundamentally new.

II. Перепишите и переведите предложения, обращая внимание на инфинитивные и причастные обороты, которым в русском языке обычно соответствуют придаточные предложения.

1. The coal bed proves to extend several kilometres under the Earth.
2. We know automation to improve industrial operation over the last 50 years.
3. Automatic control system having been used, it became possible to decrease the number of accidents at the enterprise.
4. Unless improved this lubricant cannot reduce the frictional contact between the rotating parts of the machine.
5. The substance to be subjected to heating is to be carefully analysed in our laboratory.

III. Перепишите и переведите предложения, обращая внимание на значение выделенных слов и словосочетаний.

1. To use some structural material the designer must know *either* stresses *or* deformations under various operating conditions, or *both*.
2. *Since* coal deposits are of great amount no one should be afraid that we will exaust them in 20-25 years.
3. *Since* that time only computer-aided methods have been used at the plant for *both* production *and* waste recycling.

IV. 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.

V. Прочитайте текст и постарайтесь понять его содержание. Перепишите и письменно переведите части 1 и 3.

MECHANICAL ENGINEERING

1. Mechanical engineering is a discipline of engineering that applies the principles of physics and materials science for analysis, design, manufacturing, and maintenance of mechanical systems. It is the branch of engineering that involves the production and usage of heat and mechanical power for the design, production, and operation of machines and tools. It is one of the oldest and broadest engineering disciplines.

2. The engineering field requires an understanding of core concepts including mechanics, kinematics, thermodynamics, materials science, and structural analysis. Mechanical engineers use these core principles along with tools like computer-aided engineering and product lifecycle management to design and analyze manufacturing plants, industrial equipment and machinery, heating and cooling systems, transport systems, aircraft, watercraft, robotics, medical devices and more.

3. Mechanical engineering emerged as a field during the industrial revolution in Europe in the 18th century; however, its development can be traced back several thousand years around the world. Mechanical engineering science emerged in the 19th century as a result of developments in the field of physics. The field has continually evolved to incorporate advancements in technology, and mechanical engineers today are pursuing developments in such fields as composites, mechatronics, and nanotechnology.

VI. Прочитайте 2-ю часть текста и ответьте на вопрос: *What principles do mechanical engineers use?* Запишите и переведите вопрос и ответ.