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АНГЛИЙСКИЙ ЯЗЫК

Учебное пособие для студентов технических
специальностей заочного отделения

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Данное пособие содержит контрольные задания для студентов заочного отделения технических специальностей для проведения контроля усвоения грамматического минимума и лексики тематической направленности, способствует формированию умения извлекать информацию из прочитанного текста по специальности на английском языке, а также имеет культурологическую направленность.

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Для того чтобы правильно выполнить задание №1, необходимо знать следующие грамматические темы:

1. Спряжение глагола “to be” - быть

Настоящее время (Present Tense)					
I He, she, it	am is	a worker.	We You They	are	workers.
Прошедшее время (Past Tense)					
I, he, she We, you, they		was were	a worker workers		last year.
Будущее время (Future Tense)					
I, we He, she, it, you, they		will/shall be will be	here		tomorrow.

Спряжение глагола “to have” - иметь

Present (наст.)	*Past (прош.)*	*Future (буд.)*
I, we, you, they ***have*** He, she, it ***has***	***had***	I, we ***shall/will have*** You, he, she, it, they ***will have***

2. Оборот “there is/are”

Present (наст.)	*Past (прош.)*	*Future (буд.)*
there is (ед. ч.) **there are** (мн. ч.)	**there was** (ед. ч.) **there were** (мн. ч.)	**there will be**

Этот оборот соответствует русскому выражению «имеется, есть, находится, бывает, существует». Предложения с этим оборотом следует переводить, начиная с обстоятельства места (с конца предложения).

There are many newspapers on the table. – На столе есть много газет.

There was little milk in the bottle. – В бутылке было мало молока.

3. Порядок слов в английском повествовательном предложении

При построении английского предложения слова нужно располагать в строго определенном порядке.

I	II	III	IV
Подлежащее	***Сказуемое***	***Дополнение***	***Обстоятельство***
My sister Моя сестра	translates переводит	English texts английские тексты	every day. каждый день

Обстоятельства времени иногда могут стоять в начале предложения, перед подлежащим.

Every day my sister translates English texts. –
Каждый день моя сестра переводит английские тексты.

4. Употребление существительного в функции определения

Структура «существительное + существительное + существительное и т.д.» вызывает трудности при переводе, т.к. существительные стоят подряд. Главным словом в такой группе

является последнее, а все предшествующие являются определениями к нему.

cane – тростник, ***sugar*** – сахар
cane sugar – тростниковый сахар, ***sugar cane*** – сахарный тростник

Перевод следует начинать справа налево.

products	price	decrease	-	уменьшение	цен	на изделия
1	2	3		3	2	1

stainless steel top cover – верхняя крышка из нержавеющей стали

the electric equipment supply – питание электрооборудования

5. Предлоги, соответствующие русским падежам

В русском языке существует система падежей. Слова в предложении связываются с помощью падежных окончаний. В английском языке слова связываются с помощью предлогов, которые соответствуют определенным падежам:

Предлог “of” соответствует родительному падежу (кого? чего?).

The parts of the machine – детали машин
The books of the students – книги студентов

Предлог “to” соответствует дательному падежу (кому? чему?) и всегда используется для обозначения направления.

Pass this device to the engineer. – Передайте этот прибор инженеру.

Предлог “by” соответствует творительному падежу и означает лицо, производящее действие (кем?).

The machine is controlled by an operator. – Станок управляется оператором.

Предлог “with” соответствует творительному падежу и означает орудие выполнения действия (чем?).

I write with a pen. – Я пишу ручкой.

6. Present, Past, Future Indefinite Tenses

Обозначают регулярно повторяющиеся действия в настоящем, прошедшем и будущем.

Present (наст.)	*Past (прош.)*	*Future (буд.)*
V, Vs (3 л. ед. ч.)	Ved – прав. гл. V_2 – неправ. гл.	will/shall + V (1 л. ед. и мн. ч.) will + V (ост. лица)
I ***ask*** many questions. – Я задаю много вопросов.	We ***asked*** many questions. – Мы задавали много вопросов.	I ***shall ask*** many questions. – Я задам много вопросов.
He ***asks*** many questions. – Он задает много вопросов.	They ***bought*** a new car. – Они купили новый автомобиль.	He ***will ask*** many questions. – Он задаст много вопросов.

V – verb (глагол)

Вариант 1

Прочитайте и переведите текст устно:

HERO OF ALEXANDRIA

About 60 years after the death of Archimedes, Hero of Alexandria was born. He was a great mathematician, he invented the siphon, the gearwheel, the pump, the water clock and the steam engine.

His book on mechanics was translated into Arabic and studied by mechanics and engineers of the sixteenth century. In this book he describes five principles which form the basis of all machinery in the world today. These five principles are: the lever, the wheel and axle, the pulley, the wedge, the screw.

Hero was the man, who showed for the first time that all machinery is based on these five principles and how to apply them to machinery.

At that time nobody realized the importance of Hero's invention.

Vocabulary:

Hero – Герон (изобретатель)
to invent – изобретать
siphon – сифон
gearwheel – зубчатое колесо
to describe – описывать
lever – рычаг
wheel – колесо
axle – вал
pulley – шкив
wedge – клин
screw – винт
to apply – использовать
to realize – понимать

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What is Maxim's father by profession?
2. What is his mother good at?
3. Where does his sister Anna work?
4. Who runs the house in their family?
5. What is important for family life?

ABOUT MY FAMILY AND MYSELF

I am Maxim Smirnov. I am twenty-two years old. I am a driver by profession and a student of the Agrotechnical Faculty of the Rubtsovsk Industrial Institute. It is the faculty of correspondence education. I served in the army but I am not married yet.

I want to tell you a few words about my family. It is not very large. I have got mother, father, a sister and a grandmother.

My mother is a teacher of chemistry. She works in a college. She likes her profession. She is a good-looking woman with brown hair. She is tall and slim.

My father is a computer programmer. He is forty-six. He is a very experienced specialist. My father knows all about new radio and TV sets and likes to repair old ones.

My parents have much in common but they have different views on music, books, films, sports. For example, my father is fond of horror films and my mother likes “soap operas”. My parents are hard-working people. My mother keeps the house. She is very good at cooking. My father and I try to help her with the housework. I wash the dishes, go shopping and tidy our flat.

My grandmother is a pensioner. She lives with us and helps to run the house. She is fond of working in the garden.

My sister Anna is twenty-four. She is married and has a family of her own. She works as an economist for a joint venture company. Her husband is a scientist. They have got a daughter. She goes to a nursery school.

We have got a lot of relatives. We are deeply attached to each other and we get on very well.

Family life is very important. If all the members of a family are friendly, the family is happy.

Vocabulary:

good-looking – красивый, миловидный
slim – стройный
experienced – опытный, квалифицированный
to repair – чинить, ремонтировать
to have much in common – иметь много общего
views on smth – взгляды на ч.-л.
horror film – фильм ужасов
“soap opera” – многосерийная мелодрама
to be fond of smth – увлекаться ч.-л.
to be good at cooking – хорошо готовить
to tidy – убирать, приводить в порядок
pensioner – пенсионер
to run the house – вести хозяйство
joint venture company – совместное предприятие
scientist – ученый
relative – родственник
nursery school – детский сад
to be deeply attached to smbd – быть сильно привязанным к к.-л.
to get on well – ладить друг с другом

II. Переведите текст в письменной форме.

III. Выберите нужную форму глагола “to be” и переведите предложения:

1. I (am, is, are) very busy today.
2. His brother (was, were, am) in hospital last month. He (will be, were, is) seriously ill.
3. My father (will be, am, is) very much interested in mechanics.
4. Two students (was, were, will be) absent from the last lesson.
5. Tomorrow he (was, will be, is) in Amsterdam.

IV. Перепишите предложения, поставьте глагол “to have” в Past Indefinite and Future Indefinite. Переведите предложения:

1. They have time to go to the stadium.
2. My brother has four exams in January.
3. We have some French fashion magazines.
4. The Technical University in Barnaul has many faculties.

V. Переведите следующие предложения:

1. There are many shops in that plant.
2. There is a growing need for qualified workers in our region.
3. There will be an electric stove in our kitchen next month.
4. There was one evening faculty at our Institute in 1946.
5. There were some magazines and a telephone on this little table.

VI. Составьте предложения из следующих слов и переведите их:

1. Busy, am, I, today, very.
2. Thirty, there are, in, students, group, our.
3. Yesterday, saw, the students, laboratories, the institute.
4. She, marks, excellent, got, physics, in.
5. The, moves, car, slowly, too.
6. Work, scientists, at this problem, now.

VII. Переведите следующие словосочетания на русский язык, обращая внимание на существительные в функции определения:

noise level
bus stop
school leaver
voltage source
compression stroke
control system
semiconductor industry
life time
first class quality
atomic energy application
steam engine
the railway bridge reconstruction
the car speed calculation

VIII. Переведите предложения, обращая внимание на предлоги:

1. He hurt his leg with a hammer.
2. He took part in the discussion of our plans for winter holidays.
3. The girl posted a New Year card to her granny.
4. Our town is visited by many tourists.
5. We eat soup with a spoon.
6. Tomorrow we'll go to the art gallery.

IX. Переведите предложения. Определите время глагола-сказуемого:

1. I am very much interested in mechanics.
2. You need fresh air, fruit and vegetables.
3. They spoke much about the history of Russia.
4. Yesterday my grandmother watched TV news.
5. Elizabeth II became queen in 1952.
6. On a sunny winter day we shall go skiing.
7. The Russian Federal Assembly (the Parliament) consists of the Federation Council and the State Duma.

Вариант 2

Прочитайте и переведите текст устно:

A. S. POPOV – INVENTOR OF THE RADIO

The wireless receiving set or radio is one of the greatest achievements of human genius. Priority in the invention of radio belongs to the Russian scientist Popov. On the 7th of May we celebrate Radio Day because on that day in 1885 the Russian scientist Alexander Popov demonstrated his first radio set to a meeting of the Russian Physical and Chemical Society.

A.S. Popov was born in 1859 in the Urals. While at school he spent all his free time on physics and mathematics. He studied at St. Petersburg University and graduated from it with honours and accepted the post of teacher in the Mining School in Kronstadt. There he began his research in electrical engineering.

The greater part of his life he devoted to the problem of the application of electromagnetic waves to wireless communication.

Popov worked on a sensitive receiving set which could pick up even the weakest radio waves. The year of 1895 is considered to be the date of the invention of the radio when Popov demonstrated his radio receiving set in operation. By the end of the year he improved his apparatus. It was the first radio receiving set in the world.

Since then the art of radio communication has progressed a great deal. Many scientists and inventors made their contributions. The radio has brought great changes to our life.

Vocabulary:

receiving set – радиоприемник
to graduate with honours – окончить высшее учебное заведение с отличием
post – должность
electrical engineering – электротехника
application – применение
wireless communication – беспроводная связь
sensitive – чувствительный
to pick up – принимать

to consider – считать
to improve – усовершенствовать

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What is Maxim Smirnov specializing in?
2. What does he do before his work begins?
3. What does he do in the evening?

MY WORKING DAY

I'm Maxim Smirnov. On weekdays I get up at 6.30 and my working day begins. I go to the bathroom, take a warm shower, clean my teeth and get dressed. I make breakfast myself. While having breakfast, I listen to the latest news over the radio.

I leave the house at 7.30 and go to the nearest bus stop. I work in a small firm. We repair cars and automobile equipment. They agreed to take me as I am a student of the Correspondence faculty of the Rubtsovsk Industrial Institute. I am specializing in "Automobiles and Automobile Equipment".

It takes me half an hour to get to work. I usually arrive at work at ten minutes past 8 though my working day begins at 8.30. I put in order my working tools: hammers, pliers, chiesels, a hack saw, welding equipment etc. My work is very labourconsuming. At 12.30 we have lunch at a small cafe just round the corner. At 13.30 I come back and work hard till 16.30. Sometimes in the evening I go to the Institute, work in the reading-room, carry out laboratory works.

When I come home, I get very tired. My family and I have supper, discuss family problems, watch TV programs, listen to music. My father reads newspapers, mother makes phone calls and I have a rest. At 11 o'clock I go to bed. I always look forward to my next working day because I like my job. I think I'll get a lot of useful experience.

Vocabulary:

weekday – будний день
to get dressed – одеваться
repair – ремонтировать

it takes me – мне требуется
put in order – приводить в порядок
pliers – кусачки
chiesel – зубило
hack saw – ножовка
welding equipment – сварочное оборудование
etc = et cetera – и т.д.
labour consuming – трудоемкий
get very tired – уставать
look forward – с нетерпением ждать
job – работа
experience – опыт

II. Переведите текст в письменной форме.

III. Выберите нужную форму глагола “to be” и переведите предложения:

1. Mathematics (will be, was, am) my favourite subject at school.
2. She (is, was, shall be) not ill now.
3. My friend (is, was, will be) a computer programmer next year.
4. The ecological problems (is, are, am) very important nowadays.
5. S. Korolyov (wil lbe, was, am) the founder of practical cosmonautics.

IV. Перепишите предложения, поставьте глагол “to have” в Past Indefinite and Future Indefinite. Переведите предложения:

1. The textbook has a lot of diagrams and illustrations.
2. I have good news.
3. Our Institute has a good library.
4. Rubtsovsk has a lot of specialists in economy.

V. Переведите следующие предложения:

1. There are many ways in which industry and education can cooperate.
2. There are some reference books on your table.
3. There was no telephone in this flat last year.
4. There will be an underground station not far from my house.
5. There were two taps in the bathroom: for cold water and hot water.

VI. Составьте предложения из следующих слов и переведите их:

1. You, the lecture, late, are, for.
2. Magazines, have, we, English, some.
3. Has, tables, the book, and, diagrams, many.
4. My, on Sunday, I, shall, aunt, visit.
5. Sister, at, his, studies, the University.
6. New, of, the construction, factories, will continue.

VII. Переведите следующие словосочетания на русский язык, обращая внимание на существительные в функции определения:

petrol engine
semiconductor material
temperature changes
tractor driver
machine parts
kinematics conceptions
weather forecast
lubrication system
motor oil
brake system
disk brakes
high voltage source
summer vacation

VIII. Переведите предложения, обращая внимание на предлоги:

1. The roofs of the houses are covered with snow.
2. She buys many toys to her daughter.
3. At this time of the day the buses are over crowded.
4. The professor received an invitation to the conference.
5. Radio was invented by A. Popov.

IX. Переведите предложения. Определите время глагола-сказуемого:

1. All is well that ends well.
2. I hope you will help me.

3. They stood talking at the window.
4. The inhabitants of the mountains warmly greeted the travellers.
5. What will you say to your parents?
6. Today people use computers for weather forecast.
7. My friend works at the research institute.
8. Several scientists work at this problem.

Вариант 3

Прочитайте и переведите текст устно:

D.I. MENDELEYEV – PRIDE OF RUSSIAN SCIENCE (1834-1907)

In 1969 we celebrated the one hundredth anniversary of the publication of the Periodic Law of Elements by D.I. Mendeleyev.

D. I. Mendeleyev, the outstanding Russian scientist, was born in Tobolsk in 1834. In 1850 at the age of 16 he entered the Pedagogical Institute in Petersburg to study chemistry. Five years later he graduated from it with a gold medal and was invited to lecture on theoretical and organic chemistry at Petersburg University.

To continue his studies and research Mendeleyev was sent to Germany in 1859. While living abroad he made a number of important investigations.

The year 1868 was the beginning of his highly important work "Fundamentals of Chemistry". When working at the subject Mendeleyev analysed an enormous amount of literature, made thousands of experiments and calculations. This tremendous work resulted in the Table of Elements consisting of vertical groups and horizontal periods. Mendeleyev was the first to suggest a system of classification in which the elements are arranged in the order of increasing atomic weights. The main idea od the Periodic System is the idea of periodic repetition of properties with the increase of the atomic weights.

Arranging all the existing elements in the Table Mendeleyev had to overcome great difficulties, as a considerable number of elements were unknown at that time and the atomic weights of 9 elements (out of 63) were wrongly determined.

Thanks to his investigations Mendeleyev was able to predict not only the existence of a few unknown elements but their properties as well. Later these elements were discovered.

D. I. Mendeleyev was engaged not only in the study of chemistry. His more than 350 works deal with many subjects. Combining theory with practical activity he carried out enormous research in coal, petroleum, iron and steel industries in Russia. He died in 1907 at the age of 73.

Vocabulary:

to lecture – читать лекции
research – научные исследования
while living – живя
a number of – несколько
calculations – расчеты
to suggest – предлагать
to arrange – располагать
in the order – в порядке
repetition – повторение
property – свойство
to overcome – преодолевать
was able to – смог
unknown – неизвестный
a few – несколько
as well – а также
was engaged – был занят
deal with – иметь дело, рассматривать

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What parts does Great Britain consist of?
2. What industries are developed in Great Britain?
3. Who heads the British Government?

GREAT BRITAIN

The United Kingdom of Great Britain and Northern Ireland is situated on the British Isles. The United Kingdom is made up of four

countries: England, Wales, Scotland and Northern Ireland. The capital of the UK is London.

The British Isles are separated from the European continent by the North Sea and the English Channel. The western coast is washed by the Atlantic Ocean and the Irish Sea. The north and the west of the UK are mountainous but all the rest is a vast plain. There are a lot of rivers but they are not very long. The climate is mild the whole year round.

Great Britain is not very rich in mineral resources. It has some deposits of coal and iron ore and vast deposits of oil and gas in the North Sea.

The population of the country is 57 mln. The UK is a highly developed industrial country. It exports machinery, electronics, textile, aircraft and navigation equipment. The country imports raw materials and agricultural products.

The UK is a constitutional monarchy. In law, the Head of State is the Queen. In practice the country is ruled by the elected government with the Prime Minister at the head. The British Parliament consists of two chambers: the House of Lords and the House of Commons.

Vocabulary:

the United Kingdom of Great Britain and Northern Ireland – Соединенное Королевство Великобритании и Северной Ирландии
the House of Lords – палата лордов
the House of Commons – палата общин
to be situated – быть расположенным
to separate – разделять
to wash – омывать
mild – мягкий, умеренный
highly developed – высокоразвитый
machinery – машинное оборудование
navigation – судоходство
in law – по закону
to rule – править
to elect – выбирать
chamber – палата

II. Переведите текст в письменной форме.

III. Выберите нужную форму глагола “to be” и переведите предложения:

1. Physics (am, is, are) my favourite subject at the Technical University.
2. My sister (were, was, will be) ill last week.
3. When my granny (am, is, was) young, she (will be, was, were) an actress.
4. He (are, am, will be) a worker and his parents (will be, is, are) engineers.
5. Semiconductors (are, is, shall be) modern materials.

IV. Перепишите предложения, поставьте глагол “to have” в Past Indefinite and Future Indefinite. Переведите предложения:

1. Lathe operators have a high salary.
2. Students have dinner at the canteen.
3. My daughter has three meals a day.
4. We have many specialized laboratories at the Institute.

V. Переведите следующие предложения:

1. There are numerous branches of engineering in the world at present.
2. There is a large amount of fresh air in this shop.
3. There was nothing interesting in TV programme yesterday.
4. There will be many guests at the birthday party.
5. There were a lot of knives, forks and spoons in the drawers of the table.

VI. Составьте предложения из следующих слов и переведите их:

1. The evening, I, in, classes, attend.
2. I, cellphone, my, on, found, the table.
3. Paper, this, interesting, publishes, articles.
4. Shall, we, the Institute, go, not, tomorrow, to.
5. I, at, usually, 7 o’clock, get up.
6. A, Russia, industry, major, automaking, is, in, at present.

VII. Переведите следующие словосочетания на русский язык, обращая внимание на существительные в функции определения:

town news
diesel engine
voltage drop
compression stroke
machine operator
atom structure
geography map
chemistry experiment
engine cylinder
dynamics conceptions
students books
the research program result
the wheel invention

VIII. Переведите предложения, обращая внимание на предлоги:

1. The mechanical shop is equipped with modern lathes.
2. This poem was written by V. Vysotsky.
3. The laborant showed the experiment to the students.
4. The parts of the machine should be regularly controlled.
5. The tourists will go to the Tretyakov gallery.

IX. Переведите предложения. Определите время глагола-сказуемого:

1. Who will prepare your meals if your mother is busy?
2. Two students were absent from the last lesson.
3. Last Wednesday the first-year students went to the picture gallery.
4. The girl often helps her mother in the homework.
5. If it freezes, drivers should be careful.

Вариант 4

Прочитайте и переведите текст устно:

MARIE CURIE AND THE DISCOVERY OF RADIUM

Marie Curie was born in Warsaw on November 7, 1867. Her father was a teacher of science and mathematics in a school, and it was from him

that little Marie Sklodowska (her Polish name) learned her first lesson in science.

In 1891 she went to Paris to continue her studies. She had scarcely enough money to live on. She studied night after night after her hard day's work at the University.

Among the many scientists with whom Marie met and worked in Paris was Pierre Curie. When he met Marie he was 35 years old and was famous throughout Europe for his discoveries in magnetism.

Pierre Curie and Marie very soon became the closest friends. After a little more than a year Marie became Madame Curie.

At that time she had already her Master's degree in physics and mathematics and was busy in researches on steel. Pierre and Marie Curie were greatly interested in the work of the French scientist Becquerel. There is a rare metal uranium which emits rays very much like X-rays. The Curies wanted to discover the mystery of the rays of uranium.

Besides uranium Marie Curie began to examine every known chemical substance. She repeated her experiments time after time and found that one mineral emitted much more powerful rays than uranium. However, all Marie's experiments proved that the mineral contained some new and unknown element. Scientists call the property to give out such rays "radioactivity", and Marie Curie decided to call the new element "radium".

Vocabulary:

hard – трудный
Master's degree – степень магистра
Becquerel – Беккерель (французский ученый)
a teacher of science – преподаватель естественных наук
X-rays – рентгеновские лучи
the Curies – супруги Кюри
time after time – снова и снова
to give out – испускать

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What parts is London divided into?
2. What is Buckingham Palace?

3. Trafalgar Square is the geographical centre of London, isn't it?

LONDON

London is the capital of Great Britain, its political, economic and commercial centre. It is one of the largest cities in the world. Its population is about 8 million. The capital is divided into several parts: the City, Westminster, the West End and the East End.

The heart of London is the City, its financial and business centre. Numerous banks, offices and firms are situated there. There are some famous buildings within the City: St. Paul's Cathedral, the Tower of London.

Westminster is the historic, the governmental part of London. The Houses of Parliament is the seat of the British Government. The Clock Tower or "Big Ben" is known all over the world. Buckingham Palace is the official residence of the Queen.

The West is the richest and the most beautiful part of London. The best hotels, shops, restaurants, clubs and theatres are situated there. Trafalgar Square is the geographical centre of London.

The East End is the poorest district of London. There are a lot of factories, workshops and docks here. The East End is densely populated by working class families.

Vocabulary:

commercial – торговый
divide into – делиться на
the City – Сити
the Houses of Parliament – палаты парламента
the West End – Вест-Энд
the East End – Ист-Энд
St. Paul's Cathedral – Собор Святого Павла
the Tower – Тауэр
Trafalgar Square – Трафальгарская площадь
workshop – мастерская
densely populated – густо населенный

II. Переведите текст в письменной форме.

III. Выберите нужную форму глагола “to be” и переведите предложения:

1. English (am, is, are) my favourite subject at the Institute.
2. Yesterday we (will be, was, were) at the skating-rink.
3. At the end of his trip my brother (will be, shall be, am) very tired but happy.
4. My girl-friend (were, am, was) not in the south last summer.
5. The West End (were, is, am) the most beautiful part of London.

IV. Перепишите предложения, поставьте глагол “to have” в Past Indefinite and Future Indefinite. Переведите предложения:

1. My wife has lunch at work.
2. We have a large computer centre at the Institute.
3. An engineer has a lot of new materials at his disposal.
4. My parents have fish and cheese for supper.

V. Переведите следующие предложения:

1. There are specialized laboratories and workshops in our institute.
2. There will be a lot of flowers in the garden in summer.
3. There was no fruit at home.
4. There were many interesting articles in yesterday’s “Mestnoye Vremya”.
5. There is a nice exhibit at the town art gallery.

VI. Составьте предложения из следующих слов и переведите их:

1. Nephew, at, his, studies, the University.
2. Four, we, lectures, a day, have.
3. Groupmates, in, our, live, a hostel.
4. Sister, voice, has, a, his, good.
5. Is, main, material, the, of, metal, an engineer.

VII. Переведите следующие словосочетания на русский язык, обращая внимание на существительные в функции определения:

inflation increase
analysis problems
heat treatment laboratory
low temperatures laboratory
sales manager
disk brakes
intake stroke
weather forecast
gas engine
the Altai region newspaper
the London underground problems

VIII. Переведите предложения, обращая внимание на предлоги:

1. Electric light was invented by Thomas Alva Edison.
2. Many roads are open to school leavers.
3. Cut the cheese with a sharp knife.
4. There is a monument to Pushkin in Arts Square.
5. He gave her a big bunch of flowers.

IX. Переведите предложения. Определите время глагола-сказуемого:

1. Our country is rich in oil, gas, coal, iron and timber.
2. She drinks a glass of mineral water every day.
3. His brother was in hospital, he is seriously ill.
4. The weather will be windy tomorrow.
5. A. Pushkin published his first poem “Ruslan and Lyudmila” in 1820.
6. I forgot to phone my friend.
7. The plant produces three air-planes a year.

Вариант 5

Прочитайте и переведите текст устно:

THE FATHER OF ASTRONAUTICS

Konstantin Tsiolkovsky was a cheerful, eccentric, self-educated genius. Deaf from scarlet fever at childhood, he had no formal schooling.

But he was a natural mathematician, a practical inventor who made his own laboratory equipment, a writer of science fiction and a research worker. He was born in 1857 in Kaluga. In March, 1883 Tsiolkovsky completed an extraordinary accurate work “Free Space”, on how it was possible to orbit a sputnik around the Earth. This was probably the first use of the word “sputnik”. “Free Space” was published in 1954 though he quoted some parts of it in his “Dreams of Heaven and Earth” published in Moscow in 1895. He wrote: “An Earth sputnik, similar to the Moon, but nearer to our planet, just about 300 versts from the Earth’s surface, will represent a very small mass free from the pull of gravitation.

He discussed how to create sputniks and the speed of their movement in orbit. Sixty-two years later, when the first sputnik was launched, it orbitted at a height of about 300 versts and its speed reached eight versts a second, as the old scientist had told.

This self-taught scientist – most of his learning came from library shelves – was not interested only in the theory of space travel. In 1878 he constructed a primitive centrifuge to test – on chickens and mice – the effect of acceleration and overloadind on living organisms.

At this time, too, he sketched instruments which could simulate conditions of weightlessness on the ground. Now all these sketches and manuscripts are in his museum-home at Kaluga.

In 1903 Tsiolkovsky published the “Scientific Review on Space Research by Jet Engines”, a work which is widely read today by spcialists in this field.

In his modest cottage at Kaluga, in the time he could spare from teaching mathematics at a local school, he carried out his scientific work, but he was poorly paid and had no money to finance experiments. The principles for multi-stage rockets were described by Tsiolkovsky. He died in 1935 confident that his lifetime’s work would be realized.

Vocabulary:

self-taught, self-educated – самоучка
scarlet fever – скарлатина
science fiction – научная фантастика
accurate – точный
extraordinary – чрезвычайно
“Free Space” – «Свободное пространство»
to launch a sputnik – запускать спутник

to test – испытывать
overloading – перегрузка
review – обзор
research – исследование
jet engine – реактивный двигатель
field – область, сфера (знаний)
to carry out – выполнять
multi-stage – многоступенчатый
to realize – понимать, осуществлять

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What news does “Mestnoye Vremya” carry?
2. What articles does my mother like to read?
3. Is “Express” a popular paper?

NEWSPAPERS

It is almost impossible to imagine our life without newspapers. Millions of copies of them appear every day. Some people subscribe to papers, others buy them at the newsstands. There are national and local papers. They may be morning or evening, weekly or daily.

I’ll tell you about the newspaper my family subscribe to. It is “Mestnoye Vremya”. It was first published on September 7, 1922.

The paper contains current news of our town, letters of readers to the editor, questions to the administration head and answers to them. The paper informs the readers of the achievements and drawbacks in the work of the town industrial enterprises. There are articles devoted to outstanding people of the town. My mother likes to read articles on social problems and pages devoted to pensioners. Some articles irritate her and some are of great pleasure.

Young people are interested in sporting news, short stories and jokes.

It’s a pity that the newspaper doesn’t carry international news. The paper publishes a TV programme.

There are also some free local papers which are delivered to people’s homes whether they ask for them or not. They usually contain a lot of advertisements. For example, “RTV-3” and “Express”. My family reads these papers from the first to the last page.

Vocabulary:

to deliver – доставлять
to subscribe to – подписываться
newsstand – газетный киоск
free – *зд.* бесплатный
advertisement – рекламное объявление
editor – редактор
to devote – посвящать
appear – появляться
national paper – центральная газета
to be of great pleasure – доставлять удовольствие
it's a pity – жаль
national economy – народное хозяйство
copy – (мн. ч. - copies) экземпляр

II. Переведите текст в письменной форме.

III. Выберите нужную форму глагола "to be" и переведите предложения:

1. English (was, is, am) a global language.
2. I (will be, shall be, was) an engineer when I grow up.
3. When I come home tomorrow, all my family (will be, am, was) at home.
4. The students hostel (is, were, am) not far from the Institute.
5. Professor N. (am, is, shall be) the dean of our faculty now.

IV. Перепишите предложения, поставьте глагол "to have" в Past Indefinite and Future Indefinite. Переведите предложения:

1. Our family has breakfast at half past 7.
2. They have three rooms in a new flat.
3. The students have winter holidays in January.
4. We have little free time.

V. Переведите следующие предложения:

1. There are many grades of steel used in industry.

2. There is a picture by I. Repin on the wall.
3. There will be much snow this winter.
4. There was no money in my purse.
5. There were some new words in the exercise.

VI. Составьте предложения из следующих слов и переведите их:

1. A map, has, the Russian Federation, she, of.
2. Read, we, newspapers, English, the lessons, at.
3. Family, to, subscribe, my, newspapers, three.
4. Brother, buy, my, will, a, car, new, month, next.
5. A lot of, produces, the plant, engines, automotive.

VII. Переведите следующие словосочетания на русский язык, обращая внимание на существительные в функции определения:

voltage drop
exhaust stroke
administration head
power consumption
prices increase
normal operation conditions
hot water pipe
valve mechanism
problem analysis
analysis problems
screw thread
institute laboratory

VIII. Переведите предложения, обращая внимание на предлоги:

1. The little boy cut his finger with a knife.
2. She sent him a box of chocolates.
3. We shall go to the railway station at half past 9.
4. America was discovered by Columbus.
5. My granny sent a letter to her school friend.

IX. Переведите предложения. Определите время глагола-сказуемого:

1. My friends will come to see me tonight.
2. Nick always gives good advice.
3. Electric cars will provide traffic safety.
4. Last winter I visited the swimming-pool twice a week.
5. Charles Dickens became a famous writer after he wrote his humorous stories in 1837.

КОНТРОЛЬНОЕ ЗАДАНИЕ №2

Лексические темы	Грамматические темы
1. The Russian Federation 2. St. Petersburg 3. Capitals of Russia 4. Our Institute 5. Sports in Russia	1. Participle I (причастие настоящего времени) 2. Present, Past, Future Continuous (настоящее, прошедшее, будущее длительное время) 3. Participle II (причастие прошедшего времени) 4. Present, Past, Future Perfect (настоящее, прошедшее, будущее совершенное время) 5. The Degrees of Comparison (степени сравнения прилагательных)

Для того чтобы правильно выполнить задание №2, необходимо знать следующие грамматические темы:

1. Participle I (причастие настоящего времени)

Participle I** (reading) = **основа глагола + ing

В предложении Participle I может быть:

1) определением и переводится причастием (с суффиксами -ущ, -ющ, -ащ, -ящ, -вш, -ш)

*We saw some children **playing** football on the green.* – Мы увидели детей, играющих в футбол на лужайке.

2) обстоятельством и переводится деепричастием (с суффиксами -а, -я, -ав, -ив)

A brick fell from the roof narrowly ***missing*** *a passer-by.* – С крыши упал кирпич, едва не попав в прохожего.

2. Present, Past, Future Continuous (настоящее, прошедшее, будущее длительное время)

to be + Ving (participle I)

Present Continuous
(am, is, are doing)

What ***are*** *they* ***doing*** *now? – They* ***are walking*** *in the park.*
Что они делают сейчас? – Они гуляют в парке.

Past Continuous
(was, were doing)

While Carol ***was working*** *on the computer an e-mail arrived. –*
Пока Кэрол работала на компьютере, пришло сообщение по электронной почте.

Future Continuous
(shall/will be doing)

Our children ***will be sleeping*** *when we come home from the football match. –*
Наши дети будут спать, когда мы придем домой после футбольного матча.

3. Participle II (причастие прошедшего времени)

Participle II (причастие II) – это третья основная форма глагола (V_3). Правильные глаголы образуют Participle II прибавлением к основе глагола суффикса -ed. У каждого неправильного глагола своя особая форма для Participle II.

Правильные глаголы				***Неправильные глаголы***			
1	2		3	1	2		3
open	– opened	–	opened	be	– was, were	–	been
1	2		3	1	2		3
call	– called	–	called	come	– came	–	come

В предложении Participle II может быть определением и переводится причастием (с суффиксами -нн, -ем, -т, -ш, -вш).

*Goods **delivered** by foreign traders are checked by the customs. –*
Товары, поставляемые зарубежными торговцами, проверяются таможней.

4. Present, Past, Future Perfect (настоящее, прошедшее, будущее совершенное время)

have + V_3 (participle II)

Present Perfect (just, never, for)
have, has done

*They **have** never **been** to England. –*
Они никогда не были в Англии.

*He **has** never **been** to England. –*
Он никогда не бывал в Англии.

Past Perfect (before, after, by the time)
had done

*How long **had** they **known** each other before they got married? –*
Как долго они были знакомы до того, как поженились?

Future Perfect (by the time)
shall, will have done

*The mechanic **will have repaired** my car by tomorrow morning. –*
Механик починит мой автомобиль к завтрашнему утру.

5. The Degrees of Comparison
(степени сравнения прилагательных)

Положительная степень	Сравнительная степень	Превосходная степень
1. односложные и двусложные прилагательные	***-er***	***-est***
long - длинный	long**er** - длиннее	the long**est** – самый длинный
clever - умный	clever**er** - умнее	the clever**est** – самый умный
2. многосложные прилагательные	**more**	**the most**
beautiful - красивый	**more** beautiful – более красивый	**the most** beautiful - самый красивый
3. Прилагательные, которые имеют особые формы в сравнительной и превосходной степени		
good - хороший	**better** - лучше	**the best** - самый лучший
bad - плохой	**worse** - хуже	**the worst** - самый плохой
little - маленький	**less** - меньший	**the least** - наименьший
much, many - много	**more** - больше	**the most** - наибольший

Вариант 1

Прочитайте и переведите текст устно:

A FEW UNITS NAMED AFTER FAMOUS SCIENTISTS

Words like *volt* or *watt* have become part of our language so completely that we sometimes forget that these are the names of famous scientists.

Let us recall a few such units...

An *ampere* is a unit of electric current in common use. It is that current which, when passed through a solution of silver nitrate in water, will deposit silver at the rate of 0.001118 grams per second. The unit is named after Andre-Marie Ampere (1775-1836), the famous French physicist and mathematician.

A *bel* is a unit for comparing two values of power. It is ten times the size of the more frequently used decibel, which is used as a measure of response in all types of electrical communication circuits. The unit is named after Alexander Graham Bell (1847-1922), the American inventor of the telephone.

A *coulomb* is a unit of electric charge equal to the quantity of electricity transferred in one second by a current of one ampere. It is named after Charles Augustin de Coulomb (1736-1806), the prominent French physicist.

A *curie* (Cu) is a unit of the measurement of radioactivity. It is named after Pierre and Marie Curie, French physicists.

A *farad* is a unit of electrical capacitance. It is named after Michael Faraday (1791-1867), the famous English physicist.

A *gal* is a unit of acceleration used in describing the effects of gravity. It is an acceleration of one centimetre per second each second. The unit is named after Galileo Galilei (1564-1642), the famous Italian scientist.

A *newton* is a unit of force in the International Measurement System (SI). It is named after Sir Isaac Newton (1642-1727), the English scientist, a professor of Cambridge University.

A *roentgen* is a unit of radiation. It is named after Wilhelm Conrad Roentgen (1845-1923), the famous German physicist.

A *volt* is the difference of potential between two points if one joile of work is required to transport one coulomb of charge from one point to the other. It is named after Alessandro Volta (1745-1827), the Italian physicist.

A *watt* is a unit of power. It is named after James Watt (1736-1819), the English inventor of a steamengine.

Vocabulary:

an ampere [ˊæmpɛə] – ампер
silver nitrate – азотнокислое серебро
to deposit – делать отложение (отлагать)

it is ten times the size – в десять раз больше
a measure of response – мера чувствительности
a coulomb [ˊku:lɔm] – кулон
a curie [kju:ri:] – кюри
a farad [ˊfærəd] – фарад
a roentgen [ˊrɔntjen] – рентген
a volt [voult] – вольт
a watt [wot] – ватт

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What countries does the Russian Federation border on?
2. What branches does the country government consist of?

THE RUSSIAN FEDERATION

1 The Russian Federation is the largest country in the world. It is situated in the eastern part of Europe and the north of Asia. The Russian Federation covers a large territory and borders on England, Estonia, Lithuania, Byelorussia, the Ukraine, Georgia, Azerbaijan, Kazakhstan, China, Mongolia. Three oceans and 12 seas form the natural borderline of the country. The population of Russia is about 140 mln people.

2 The climate is mainly continental. Winter in some parts of the country lasts as long as six months. A very large part of the Russian Federation is covered with forests. Many of the rivers by their length are considered to be the longest in the world. They are: the Ob, the Lena, the Volga.

The Russian Federation is very rich in mineral resources: coal, iron ore, natural gas, metals and other minerals.

3 The Russian Federation is a multinational state.

Moscow is the capital of our Homeland. It is the largest political, scientific, cultural and industrial center. Russian is the official language of the state. The national symbols of the Russian Federation are a white-blue-red banner and a double-headed eagle.

4 The Russian Federation is a constitutional republic headed by the President. The country government consists of three branches: legislative, executive and judicial.

5 The legislative power belongs to the Federal Assembly comprising two chambers: the Council of Federation (upper Chamber) and the State Duma (lower Chamber). Each chamber is headed by the Speaker. The executive power belongs to the government (the Cabinet of Ministers) headed by the Prime Minister. The judicial power belongs to the system of Courts.

6 Our country has a multiparty system.

Vocabulary:

to be situated – быть расположенным
to border on – граничить с
population – население
to consider – считать, полагать
to be rich in – быть богатым
state – государство
to comprise – включать, охватывать
banner – знамя, флаг
legislative – законодательный
executive – исполнительная
judical – судебная
Federal Assembly – Федеральное собрание
the Council of Federation – Совет Федерации
State Duma – Государственная дума

II. Переведите в письменной форме абзацы 1, 4, 5.

III. В следующих предложениях подчеркните причастие I, переведите предложения:

1. Russia stretching from the arctic seas to the Black Sea is the largest country in the world.
2. We can see a train standing at one of the platforms ready to leave.
3. Pursuing the policy of peace our country tries to strengthen its economic, political and cultural cooperation with all countries of the world.
4. The legislative power in our country belongs to the Federal Assembly comprising two chambers: the Council of Federation and the State Duma.

IV. Переведите следующие предложения и определите время глагола-сказуемого:

1. While we were waiting for the flight to Russia Pat went to the newsstand to buy a newspaper.
2. Are you reading a journal in English now?
3. I am leaving for Russia. This time tomorrow we will be crossing the Atlantic Ocean.
4. A train has just come in. The passengers are getting out.

V. В следующих предложениях подчеркните причастие II, переведите предложения:

1. The Russian Federation situated in the eastern part of Europe and the north of Asia is the largest country in the world.
2. The Russian Federation is a multinational state inhabited by 140 mln people.
3. The article published in the newspaper is interesting.
4. The Russian Federation is a constitutional republic headed by the President.

VI. Переведите следующие предложения и укажите, в каком времени стоит глагол-сказуемое:

1. The Russian Federation borders on many countries.
2. He has never been to Siberia.
3. Our country has a multiparty system.
4. The legislative power belongs to the Federal Assembly in our state.
5. Our country had made a great progress in space research by 1960s.
6. The Olympic Games preparations will have been finished in our country by 2012.

VII. Переведите следующие предложения:

1. The Russian Federation is the largest country in the world.
2. A bus carries more people than a car.
3. The Ob is considered to be one of the longest rivers in the world.

Вариант 2

Прочитайте и переведите текст устно:

METRIC SYSTEM AND ITS ORIGIN

The idea of a universal system of measures and weights dates from long ago, but it was realized only two centuries ago. The metric or decimal system was worked out by the French Academy of Sciences in 1791.

How were the units for length and weight defined?

Two French scientists who were given the task to define these units took one fourth of the distance from the North Pole to the Equator on the geographical meridian which is running through Paris (the distance from Dunkirk in France to Barcelone in Spain) and divided it into ten million equal parts. One of these parts was called a metre or “measure”. For shorter measurements the metre was divided by ten, for longer things the metre was multiplied by tens.

It was easy to use the same metre for volume. The weight of one cubic centimetre of water was called a gramme. Thus the metric system was created.

Russian scientists played a great part in the spreading of the metric system in Russia as well as in other countries.

As far as in 1867 D.I. Mendeleyev addressed Russian scientists to help to spread the decimal system. The project of the law about the use of the metric system in Russia was also worked out by D.I. Mendeleyev.

It should be said, however, that up till the end of the 19^{th} century different units of measurement were used in various countries. In the Soviet Union the metric system was adopted in 1918, soon after the Great October Revolution. It is adopted by most of the countries. None of the systems of the past can be compared in simplicity to that of our days.

Vocabulary:

dates from long ago – возникла давно
to work out – разработать
to define – определять
unit – единица измерения
to divide – делить
equal – равный

to create – создавать
to spread – распространять
as far as in – еще в …
up till – вплоть до
to adopt – принимать
to compare – сравнивать

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. When did St. Petersburg become the capital?
2. What does the Hermitage contain?

ST. PETERSBURG

1 St. Petersburg is the second largest city in Russia and one of the most beautiful cities in the world. It was founded in 1703 by Peter the Great as the “Window on the West”. Thousands of workmen were brought from all parts of Russia to build a new city on the swampy land at the mouth of the Neva River. Peter the Great was in a hurry. The work was fast and hard, and workmen dropped dead by hundreds. But the work went on.

2 In 1917 St. Petersburg, a city of great beauty, with palaces, cathedrals, churches, government buildings became the capital. After the October Revolution the city was renamed after Lenin.

3 During the Great Patriotic War the city suffered a great deal. The German armies laid siege to it in 1941, and for next year and a half it was cut off from the rest of the country. No food could be brought in, and people died of starvation. Thousands of people were killed. Rebuilding took years.

4 Now St. Petersburg is an important industrial, cultural and educational centre. The population of the city is over 5 million. St. Petersburg is indeed a wonderful city: at every turn there is something to catch your eye. The Winter Palace, the Hermitage, the Russian Museum, St. Isaac’s Cathedral, the Peter-and-Paul Fortress, the Admiralty building attract thousands of tourists from every corner of the world.

5 Petersburg’s many museums house some of the world’s most famous art collections. The Hermitage, for example, contains the richest collection of pictures in the world. The city is called the Northern Venice because

there are 65 rivers and canals there with artistically decorated bridges. It's also famous for its beautiful white nights.

Vocabulary:

St. Petersburg – Санкт-Петербург
Peter the Great – Петр Великий (I)
the Neva River – река Нева
the Hermitage Palace – Эрмитаж
the Winter Palace – Зимний дворец
the Russian Museum – Русский музей
St. Isaac's Cathedral – Исаакиевский собор
the Peter-and-Paul Fortress – Петропавловская крепость
the Admiralty – Адмиралтейство
swampy – болотистый
mouth – устье (реки)
to drop dead – упасть замертво
to rename – переименовывать
to suffer – страдать
to lay siege to – осадить
starvation – голод
to catch smb's eye – привлечь внимание
to attract – привлекать, притягивать
canal – канал
artistically – мастерски
to decorate – украшать
bridge – мост

II. Переведите в письменной форме абзацы 1, 3, 4.

III. В следующих предложениях подчеркните причастие I, переведите предложения:

1. Millions of people visiting St. Petersburg enjoy the Smolny, the Winter Palace, the Admiralty and many other architectural monuments.
2. Being one of the oldest higher schools in our country St. Petersburg University celebrated its 180th anniversary in 2000.
3. Physics is a science dealing with phenomena of matter and energy.

4. Coming to learn about St. Petersburg's history visitors will find much to interest in the city.

IV. Переведите следующие предложения и определите время глагола-сказуемого:

1. Look! People are hurrying in all directions.
2. The train will be reaching St. Petersburg this time tomorrow.
3. Are you going to the Russian Museum? No, I am going to the Hermitage.
4. Yesterday night at 7 o'clock Linda and her friends were arriving in London from Stockholm.

V. В следующих предложениях подчеркните причастие II, переведите предложения:

1. St. Petersburg founded by Peter the Great was the capital of Russia.
2. Called a city of three revolutions St. Petersburg is famous for its historical places.
3. Laid siege in 1941 St. Petersburg suffered a great deal.
4. The Hermitage contains the richest collection in the world.

VI. Переведите следующие предложения и укажите, в каком времени стоит глагол-сказуемое:

1. The city on the Neva has always been the scene of revolutionary events.
2. The history of St. Petersburg had dated back by the 18th century.
3. Their family hasn't been to St. Petersburg since they left it in 1973.
4. After the Great Patriotic War had ended rebuilding took years.
5. Have you ever been to St. Petersburg? – No, I haven't.
6. Tom said that he had bought a new computer.

VII. Переведите следующие предложения:

1. St. Petersburg is the second largest city in Russia and one of the most beautiful cities in the world.
2. London is bigger than York.
3. Travelling by plane is much faster than travelling by train.

Вариант 3

Прочитайте и переведите текст устно:

PLASTICS

Plastics are substances, natural or artificial, which can be moulded into any desired shape by the application of heat and pressure.

Except for cellulosics, made from chemically modified cotton, wood and other materials, plastics are produced by synthesis from such natural resources as water, air, coal, salt and natural gas.

There are two reasons why man tries to make these materials instead of the ones provided by nature. One reason is his desire either to decrease cost or to compensate for the shortage of the natural product, or both. The second reason is the wish to produce materials with combinations of desirable properties not found in the things provided by nature.

There are inorganic and organic synthetics. The difference between organic and inorganic compounds is simply that the former contain carbon, while the latter do not. One of the most important inorganic synthetic materials is glass.

Because of their toughness, lightness, chemical resistance and other useful properties as well as the ease of manufacture, plastics products are being used in large quantities in construction, electric and electronic equipment, transportation, agriculture, etc. Synthetic plastics often take the place of metals in machine-building and in many respects their properties are higher than those of metals.

The extensive use of synthetic materials, however, does not mean that natural materials should lose their importance. On the contrary, when combined with synthetic materials they may become even more valuable.

Vocabulary:

to mould – формовать
cellulosics – целлюлоза
instead of – вместо
either ... or – или … или
to decrease – уменьшать
shortage – недостаток, нехватка
property – свойство

to find (found) – обнаруживать, находить
the former ... – первый (из вышеупомянутых) …
the latter ... – последний (из упомянутых) …
toughness – жестокость
resistance – сопротивление
quantity – количество
in many respects – во многих отношениях
to lose – терять
on the contrary – наоборот
valuable – ценный

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What similar museums are there in Moscow and St. Petersburg?
2. Was Moscow contrasted to St. Petersburg?

CAPITALS OF RUSSIA

1 Moscow and St. Petersburg differ a lot from other cities of Russia. Home to many millions of people, they leave Nizhni Novgorod and Novosibirsk far behind, though the latter have approximately the same number of citizens. Both capitals have rich cultural past depicted by writers, musicians and painters.

2 The status of capital was transferred from one city to the other several times. Nevertheless, Moscow and St. Petersburg have always played major roles in the life of the state, remaining political, historical and cultural centers. In short, Russia has had two capitals and not just one.

3 The difference between the two cities was stressed by Great Russian writers. Thus, Gogol compared St. Petersburg with an economical German who, before organizing a party, will carefully calculate his money. On the contrary, Moscow had the reputation of the city where everybody enjoyed life without thinking about the days to come. Dostoevsky also stressed that there is nothing more contrasting than the two capitals, but everything that was born in St. Petersburg appreared immediately in Moscow and vice versa. The soul was the same.

4 Both cities have similar museums: the Russian Museum and the Hermitage in the northern capital, the Pushkin Museum of Fine Arts and the Tretyakov Gallery in Moscow, conservatories, universities.

5 Moscow was situated in the center of the most important roads and was contrasted to St. Petersburg, which was a city of natural development. There is the view that Moscow became the capital thanks to its location, whereas St. Petersburg was built by Peter the Great somewhere in the marshes, far from the heart of the Russian state.

6 Nevertheless, there is a similar trait in the geographical location of both cities: it is very advantageous. St. Petersburg was a kind of gate to the north-west of Russia; Moscow, when many canals were built around it, became a port of five seas. The two capitals were and remained leaders of the economic development in the country, and are centers of science and technologies.

7 As for differences, St. Petersburg is specialized in shipbuilding, Moscow pays more attention to aircraft and space technologies.

8 The growing importance of both cities has led to some negative results. Thus, Moscow and St. Petersburg concentrated small industries that attracted people from all over the country.

9 The architecture of both capitals is also very different. There are a lot of dead-ends in Moscow, whereas in St. Petersburg it may seem that every side street tends to become a large avenue. Streets in the northern capital appeared before buildings, and squares even before streets, that is why they do not depend on the houses. In Moscow,on the contrary, it is the house, which plays the main role.

Vocabulary:

approximately – приблизительно, почти
depict – описывать, изображать
remain – оставаться
compare – сравнивать
appear – появляться
vice versa – наоборот
a view – точка зрения, взгляд, мнение
a marsh – болото
a trait – особенность
advantageous – благоприятный, выгодный
lead (led) – приводить, вести
seem – казаться
depend on – зависеть
on the contrary – наоборот

II. Переведите в письменной форме абзацы 1, 2, 5, 6, 8.

III. В следующих предложениях подчеркните причастие I, переведите предложения:

1. Moscow and St. Petersburg have always played great roles in the life of the state, remaining political, historical and cultural centers.
2. Having similar museums: the Russian Museum and the Hermitage in the northern capital, the Pushkin Museum of Fine Arts and the Tretyakov Gallery in Moscow, both cities are fascinating.
3. Listening to the lecture students usually make notes.
4. Visitors having plenty of money to spend, pass their time in fine shops, elegance restaurants.

IV. Переведите следующие предложения и определите время глагола-сказуемого:

1. He usually lives in Moscow but he is staying in St. Petersburg for two months.
2. She found some old letters while she was tidying up her room.
3. Carol is doing her shopping now.
4. Ann often goes to Moscow for her holidays but this year she is saving money to buy a flat.

V. В следующих предложениях подчеркните причастие II, переведите предложения:

1. Depicted by writers, musicians and painters Moscow and St. Petersburg have rich cultural past.
2. Specialized in shipbuilding and electronics St. Petersburg is known for its highly developed industry.
3. When participated in peace manifestations trade unions played a leading role.
4. The architecture of both capitals is very different.

VI. Переведите следующие предложения и укажите, в каком времени стоит глагол-сказуемое:

1. Mocow and St. Peterburg have always played major roles in the life of the state.
2. Both capitals have rich culture.
3. Before Moscow became the capital of the Soviet Republic in 1918, it had been one of the oldest Russian cities.
4. Moscow and St. Peterburg have remained leaders of the economic development in the country for a long time.
5. The growing importance of both cities has led to some negative results.
6. He had finished his translation by 6 o'clock.

VII. Переведите следующие предложения:

1. Moscow is a very ancient city.
2. In what district of St. Petersburg are there the most expensive shops?
3. I am tall but my sister is taller than me and my brother is the tallest in the family.

Вариант 4

Прочитайте и переведите текст устно:

ENGINES

Do you know what the first engine was like? It was called the "water wheel". This was an ordinary wheel with blades fixed to it, and the current of a river turned it. These first engines were used for irrigating fields.

Then a wind-powered engine was invented. This was a wheel, but a very small one. Long wide wooden blades were attached to it. The new engine was driven by the wind. Some of these one can still see in the country.

Both of these, the water- and wind-operated engines are very economical. They do not need fuel in order to function. But they are dependent on the weather.

Many years passed and people invented a new engine, one operated by steam.

The steam engine drove all sorts of machines, for example, steam ships and steam locomotives. Indeed, the very first aeroplane built by A.F.

Mozhaisky also had a steam engine. However, the steam engine had its disadvantages. It was too large and heavy, and needed too much fuel.

The imperfections of the steam engine led to the design of a new type. It was called the internal combustion engine, because its fuel ignites and burns inside the engine itself.

The internal combustion engine is now used in cars, diesel locomotives and motor ships.

Vocabulary:

engine – двигатель
blade – лопасть
to invent – изобретать
wooden – деревянный
to drive – приводить в движение
fuel – топливо
dependent – зависимый
to pass – проходить
steam – пар
however – тем не менее, однако
disadvantage – недостаток
imperfection – несовершенство
internal combustion engine – двигатель внутреннего сгорания
to ignite – воспламенять
to burn – гореть, сжигать
inside – внутри

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. When was the Institute established?
2. When does the academic year begin?

OUR INSTITUTE

1 I am a second-year student of the Rubtsovsk Industrial Institute. The institute was established in 1946. Primarily it was the Evening Faculty of the Altai Polytechnical Institute. Nowadays many things have changed. The Institute is made up of 7 faculties: Technological, Electrotechnical,

Humanitarian, Agrotechnical, the faculty of Special secondary education, the faculty of Correspondence education and the Extension education faculty. It trains engineers in following specialities: Organization Management, Finance and Credit, Economy and Management, Technology and Business, Applied Mathematics, Civil and Industrial Engineering, Machines and Equipment of Food-processing Industry, Technology of Machinery, Automobiles and Tractors, Automobiles and Equipment, Electrifying of Industrial Enterprises.

2 My fellow-students are specializing in different fields. The course of study at the Institute lasts 5 years. The first and the second-year students study English, higher mathematics, physics, chemistry, economics, philosophy, pedagogy, psychology and a number of other subjects.

3 The students who attend lectures regularly, usually pass their examinations more successfully. They get good and excellent marks and seldom fail.

4 The academic year begins in September and is over in June. There are two terms in the course of the academic year. Twice a year the students take examinations and tests. During the terms students have to attend lectures, to carry out laboratory tests and to do practical work. They have at their disposal all kinds of laboratories, a good library and a reading room, a gymnasium, some computer rooms. The laboratories are provided with the most up-to-date equipment. The students make different experiments and carry on research work there.

Vocabulary:

to be a first-year student – быть студентом первого курса
to be a second-year student – быть студентом второго курса
to be established – быть основанным
to be made up of – состоять из
to specialize – специализироваться
to last – длиться
to attend lectures – посещать лекции
to take the exam – сдавать экзамен
to pass the exam – сдать экзамен
to fail the exam – провалить экзамен
to get good (excellent) marks – получать хорошие (отличные) оценки
to be over – заканчиваться

to carry out – выполнять
to have at the disposal – иметь в распоряжении
to be provided with – быть обеспеченным
faculty of Special secondary education – факультет среднего специального образования
Correspondence faculty – факультет заочной формы обучения
Extension education faculty – факультет повышения квалификации
Automobilies and Equipment – автомобили и автомобильное хозяйство
Electrifying of Industrial Enterprises – электроснабжение промышленных предприятий
Civil and Industrial Engineering – промышленное и гражданское строительство
field – область знания
academic year – учебный год
up-to-date equipment – современное оборудование

II. Переведите в письменной форме абзацы 1, 2, 4.

III. В следующих предложениях подчеркните причастие I, переведите предложения:

1. Our Institute having seven faculties trains engineers in many specialities.
2. Attending lectures regularly students pass their exams more successfully.
3. Physics is a science dealing with phenomena of matter and energy.
4. Delivering the final lecture of the term the professor emphasised the fact that each student should (следует) prepare for the exam thoroughly.

IV. Переведите следующие предложения и определите время глагола-сказуемого:

1. Hello, Jane! Are you taking your exams? – Yes, I am.
2. When he came in Laura was washing plates.
3. At the moment I am reading a fascinating book about Tibet.
4. While Carol was working on the computer an e-mail arrived.

V. В следующих предложениях подчеркните причастие II, переведите предложения:

1. Our Institute established in 1946 was the Evening Faculty of the Altai Polytechnical Institute.
2. Students have at their disposal all kinds of laboratories equipped with the latest apparatuses.
3. Above mentioned students are my friends.
4. Our gymnasium built in 2000, is the place of city competitions.

VI. Переведите следующие предложения и укажите, в каком времени стоит глагол-сказуемое:

1. Nowadays many things have changed.
2. The Agrotechnical faculty had been organized by 1999.
3. He hasn't been to the Institute since he graduated from it in 1997.
4. The academic year begins in September.
5. After she had graduated from the Institute she took postgraduate course.
6. I have just been to the dean's office.

VII. Переведите следующие предложения:

1. The laboratories are provided with the most up-to-date equipment.
2. The book is difficult to understand.
3. His plan is more complex than ours.

Вариант 5

Прочитайте и переведите текст устно:

COMPUTER

One of the most important developments of the 20th century is the computer. As a consequence, there is now at the service of man an inanimate power of over 200 billion calculating operations per second, supplementing the thinking and the memory of man.

Computers are used nowadays for many different kinds of work, e.g. in offices, banks, factories, hospitals, universities and schools. Their use is becoming more widespread as cheaper and smaller computers become available. People can now buy small personal computers.

What are computers? And what can they be used for? Computers are electronic systems. They are used for handling, or processing, facts and figures. The facts and figures processed by a computer are usually known as data.

A computer can be used to process many different types of data. For example, a scientist can use a computer to do numerical calculations. A businessman can use a computer to analyze a list of customers or stock (stores held by the business). An engineer can use a computer to produce diagrams or plans.

Vocabulary:

as a consequence – в результате
per second – в секунду
widespread – широкораспространенный
cheap – дешевый
data – данные, информация

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. Are there any sporting societies and clubs in Russia?
2. Do our sportsmen participate in the Olympic Games?

SPORTS IN RUSSIA

1 Millions of people all over the world are fond of sports and games. Sport helps people to stay in good shape, keeps them fit, healthy and makes them more organized and better disciplined in their daily activities.

2 We have always paid great attention to sport in our schools, colleges and universities. You can hardly find a school without a gym or a sports ground. Every city has a few stadiums or swimming pools where local competitions are usually held.

3 It’s been a tradition in the country to divide sport into professional and amateur. There are different sporting societies and clubs in Russia.

Many of them take part in different international tournaments and are known all over the world. A great number of world records have been set by Russian sportsmen: gymnasts, weightlifters, tennis players, swimmers, figure skaters, runners, high jumpers. Our sportsmen also participate in the Olympic Games and always win a lot of gold, silver and bronze medals.

4 There are also a lot of amateur clubs and keep-fit centres in Russia where people go in for aerobics, yoga, body-building, swimming, skating, jogging. Thousands of people go to the stadiums to support their favourite team and many thousands more prefer to watch the games on TV. But watching sports events and going in for sports are two different things.

5 My favourite kind of sport is tennis. I've been playing it since I was eleven years old, and the more I play it the more I like it. There is a good tennis court not far from my house and whenever I have a chance I go there with a friend of mine.

Vocabulary:

in good shape – в хорошей спортивной форме
disciplined – дисциплинированный
to pay attention – обращать внимание, уделять внимание
hardly – едва ли, с трудом
sports ground – спортивная площадка
local – местный
professional – профессиональный
amateur – любительский
sporting society – спортивное общество
tournament – турнир
throughout the world – во всем мире
record – рекорд
to set (set, set) – установить
gymnast – гимнаст
weightlifter – тяжелоатлет
figure skater – фигурист
high jumper – прыгун в высоту
to participate – принимать участие
keep-fit centre – оздоровительный центр
aerobics – аэробика
yoga – йога

body-building – бодибилдинг, развитие мышц тела с помощью физических упражнений
jogging – бег трусцой
to support – поддерживать, болеть
whenever – когда бы ни

II. Переведите в письменной форме абзацы 1, 3, 4.

III. В следующих предложениях подчеркните причастие I, переведите предложения:

1. Our sportsmen participating in the Olympic Games always win gold, silver and bronze medals.
2. Watching games on TV thousands of people root for their favourite teams.
3. Every 4 years a runner carrying a burning torch (факел) which symbolizes the link with Olympic Games in ancient Greece lights the Olympic flame (огонь) which burns (горит) throughout the Games.
4. Going in for sports people stay in good shape.

IV. Переведите следующие предложения и определите время глагола-сказуемого:

1. Are you watching a volleyball game on television? – No, I am not.
2. She was watching ski-jumping competitions at 2 o'clock yesterday.
3. While walking in the garden I saw little boys and girls making their first steps in sport.
4. Our children will be sleeping when we come home from the football match.

V. В следующих предложениях подчеркните причастие II, переведите предложения:

1. Participated in different international tournaments Russian sportsmen set world records.
2. People enjoyed figure-skating competitions like to watch them on TV.
3. Football invented by the British is very popular in many countries.
4. Baseball is a game played by two teams of 9 players each.

VI. Переведите следующие предложения и укажите, в каком времени стоит глагол-сказуемое:

1. We have always paid great attention to sport in our schools, colleges and universities.
2. Every city has a few stadiums or swimming pools.
3. I have never missed a single match played by “Spartak”.
4. After I had gone in for gymnastics many years passed.
5. Our team always opens the score.
6. Our Institute will have built a gym by next year.

VII. Переведите следующие предложения:

1. The most popular games in Britain today are football, tennis and golf.
2. The fat man sat down on the comfortable chair.
3. His new girlfriend is more beautiful than his old one.

КОНТРОЛЬНОЕ ЗАДАНИЕ №3

Лексические темы	Грамматические темы
1. Isaac Newton 2. Albert Einstein 3. The First Russian Woman-Scientist 4. Nikolai Ivanovich Lobachevsky 5. Faraday Puts Electricity to Work	1. Passive Voice (страдательный залог) 2. Modal Verbs and Their Equivalents (модальные глаголы и их эквиваленты) 3. Неопределенные местоимения some, any, no 4. Infinitive and Its Functions (инфинитив и его функции в предложении)

Для того чтобы правильно выполнить задание №3, необходимо знать следующие грамматические темы:

1. Passive Voice (страдательный залог)

Формула образования страдательного залога:

to be в соответствующем времени + ***Participate II*** смыслового глагола

Глагол в страдательном залоге обозначает действие, которое производится над подлежащим.

The experiment was done by all first-year students. –
Этот опыт проделан всеми студентами-первокурсниками.

Present Indefinite	**am, is, are asked**
Past Indefinite	**was, were asked**
Future Indefinite	**will/shall be asked**

2. Modal Verbs and Their Equivalents (модальные глаголы и их эквиваленты)

Глагол “can” означает физическую или умственную возможность выполнить действие.

I can skate. – Я умею кататься на коньках.

She can speak French. – Она может говорить по-французски.

Глагол “may” означает разрешение или вероятность совершения действия.

May I enter the room? – Можно войти в комнату?

She may be late. – Может быть, она опоздает.

Глагол “must” означает долженствование.

You must do it now. – Ты должен сделать это сейчас.

Эквиваленты глагола “must”

1. *have to + глагол* – выражает вынужденную необходимость

She has to go to the library though it was late. –
Ей пришлось пойти в библиотеку, хотя было поздно.

2. *be to + глагол* – означает заранее намеченное действие

We are to meet at 6 o'clock. –
Мы должны (запланировали) встретиться в 6 часов.

4. *should* – означает совет (следует)

You should not go there. – Тебе не следует туда ходить.

3. Неопределенные местоимения some, any, no

some – несколько, некоторый, какой-нибудь, немного

в утвердительных предложениях: *I have **some** friends here.*

any – несколько, немного, какой-нибудь

в вопросительных предложениях: *Do you have **any** friends here?*

в отрицательных предложениях: *I have not **any** friends here.*

в утвердительных предложениях со значением «любой», «всякий»:

*You can find this book in **any** shop. –*
Вы можете найти эту книгу в любом магазине.

no – никакой, нет

в отрицательных предложениях: *I have **no** friends here.*

4. Infinitive and Its Functions (инфинитив и его функции в предложении)

Infinitive (инфинитив) – это то же самое, что неопределенная форма глагола. Показателем инфинитива является частица to.

to clean – чистить
to buy – покупать

В предложении инфинитив или инфинитивный оборот может быть:

a) подлежащим (переводится существительным или неопределенной формой глагола)

To operate the complex device is rather difficult. –
Управлять (управление) этим сложным механизмом довольно трудно.

b) обстоятельством цели (переводится неопределенной формой глагола с союзом *чтобы*, *для того чтобы*)

We must learn to protect the water, the air and the earth from pollution in order to make our life better and healthier. –
Мы должны уметь защищать воду, воздух и землю от загрязнений, чтобы сделать нашу жизнь лучше и здоровее.

Вариант 1

Прочитайте и переведите текст устно:

SOME INVENTIONS IN THE FIELD OF POWER ENGINEERING

Many methods of making and storing electric charges were discovered during the 18^{th} century. One of the first was the friction machine. Benjamin Franklin discovered in 1752 that lightning and electricity were the same. At the same time the Russian Academicians M.V. Lomonosov and Rikhman proved the electrostatic nature of electricity of the atmosphere.

The electricity, which was known up to that time, was what we call static electricity. Little use could be made of it because it was difficult to produce it in large quantities. Current electricity was discovered in 1780 by Galvani. Current which flew through a circuit in one direction was called a direct current.

The first electric cell was made in 1800 by the Italian scientist Volta. This discovery proved that chemical energy could be changed to electrical energy and led to the beginning of electroplating. The first storage battery was made in 1803.

By 1730 scientists had noticed a close interaction between electricity and magnetism. It was not until 1819, however, that Oersted discovered the action of an electric current on a magnet. The first powerful electromagnet was made by Henry in 1829. Then Michael Faraday found that with the aid of a bar magnet he could get a current of electricity in the coil. This is the basic principle of the dynamo and motor. By 1839 he had built a small dynamo which changed mechanical energy into electrical energy.

Generally speaking the discoveries made by scientists in the nineteenth century laid a firm foundation for future generations. They could not realize that their discoveries would some day be the basis for our large industries, the products of which affect greatly our daily lives.

The invention of the incandescent lamp by Lodygin in Russia and by Edison in the USA was the beginning of rapid developments in electricity. This discovery speeded up the improvement of the dynamo and the production of cheaper electrical energy.

New methods of carrying this electrical energy for long distances have made possible the building of large hydroelectric plants on rivers. The Krasnoyarsk hydropower plant is the first link of the future power generating cascade on the Yenisei.

Vocabulary:

to store – накапливать
quantity – количество
direct current – постоянный ток
cell – элемент
to prove – доказывать
to lead – вести, приводить
to electroplate – гальванизировать
to supply – снабжать, обеспечить
storage battery – аккумулятор
interaction – взаимодействие
aid – помощь
coil – катушка
generally – вообще
to lay (laid) – положить
life (lives – мн. ч.) – жизнь
incandescent lamp – лампа накаливания
to speed up – ускорять

capacity – мощность

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What laws did Newton formulate?
2. What did Newton make with his own hands?
3. Did Newton make any contribution to astronomy?

ISAAC NEWTON

The outstanding genius of the seventeenth century Isaac Newton was born on the 25th of December, 1642 in a small village Lincolnshire. After school Newton entered Cambridge University where later on he lectured on mathematics for more than 30 years. During the plague of 1660-1665 in England Newton left Cambridge and spent 18 months at his home in the country. In this short time he made practically all of his great discoveries. He laid the foundation of differential and integral calculus, performed experiments on light and colour, formulated the laws of motion and the law of universal gravitation.

Newton was not only a scientist. He was also a very skilled craftsman. He made the first reflecting telescope with a concave mirror, not a lens. Today all large astronomical telescopes rely mostly on mirrors to concentrate the light from distant stars. Newton was also a politician. He took part in the progressive political movements of his days. Like most great men, he was an all-round man.

Newton died in 1727 when he was 85 years old.

Vocabulary:

entered Cambridge University – поступил в Кембриджский университет
later on – позднее
differential and integral calculus – дифференциальное и интегральное исчисление
law of universal gravitation – закон всемирного тяготения
craftsman – ремесленник, мастер
a lens – линза
an all round man – широко образованный человек

like – подобно
contribution – вклад

II. Переведите текст в письменной форме.

III. Определите время и залог сказуемого, переведите следующие предложения:

1. All the work will be done by automatic machinery.
2. The young workers are trained at the plant now to use the new equipment.
3. New houses are built everywhere: in cities and villages.
4. Every faculty is headed by the Dean.
5. A new experimental minibus was made at the Likhachev Motor Works.

IV. Подчеркните модальные глаголы и их эквиваленты, переведите предложения:

1. The students may use dictionaries at the translation test.
2. He can continue his education at the correspondence faculty.
3. The team of experts is to study the reasons of the catastrophy.
4. The solar energy must heat and light our homes.
5. The engineer will have to improve the accuracy of this machine-tool.

V. Переведите предложения:

1. Scientists in the 19th century could not realize that their discoveries would some day be the basis for our large industries.
2. The old plant had no modern facilities.
3. Is there any interesting news?
4. This plant employs some highly efficient equipment.
5. If you discover any faults (дефекты) in the part, tell the engineer about them.

VI. Подчеркните инфинитив и переведите предложения:

1. Isaac Newton left Cambridge in order to spend 18 months at his home in the country.

2. Today all large astronomical telescopes rely mostly on mirrors to concentrate the light from distant stars.
3. To study this phenomenon requires much knowledge.
4. To tell her the news Tom must see her tomorrow.
5. Davy used 2000 cells to supply the first arc light.

Вариант 2

Прочитайте и переведите текст устно:

ENERGY AND THE ENVIRONMENT

Many of the most serious environment problems of the technological nations result from the use of energy. Every form of energy production is known to cause some damage to the surroundings. A large part of urban air pollution is probably caused by emission from internal combustion engines. Other forms of urban air pollution result from the combustion of coal and low grade oil in steam electric plants or central heating plants.

Hydroelectric plants are considered to cause serious problems in the environment as well. One major problem of hydroelectric plants is the enormous weight of the water that fills the lake behind the dam rather quickly after the dam is constructed. The added weight places severe stresses on the geological formation causing earthquakes in the area.

Perhaps, the most tragic problem created by Aswan High Dam on the Nile River is in the increase of diseases. The still waters behind the dam prove to create a good ground for insects carrying diseases.

Another form of environment degradation common to electric power generation is thermal pollution – the dumping of wasted heat into streams of water or the atmosphere. The warmed water is rather quickly mixed with the streams of water in a lake, this having a harmful effect upon ecological balance of the lake.

In order to obtain enormous amounts of energy we are building powerful atomic electric stations which open up fine prospects in atomic power industry. However, nuclear plants are capable of polluting the environment with radioactive atoms of various elements. The largest potential source of nuclear energy is thermo – nuclear fusion by which the nuclei of small atoms are combined to form larger nuclei. However, these

power plants also contaminate the environment with radioactive elements that are released when the fuel is burnt.

Vocabulary:

environment – окружающая среда
to cause – причинять
damage – ущерб
emission – выбросы (продукты сгорания)
internal combustion engine – двигатель внутреннего сгорания
to consider – считать
as well – также
major – главный
enormous – огромный
to fill – заполнять
to add – добавлять, прибавлять
disease – болезнь
still – спокойный, тихий
to carry – носить, переносить
in order to – для того, чтобы
to obtain – получать
amount – количество
capable – способный
various – различный
nucleus – ядро
nuclei – ядра
to contaminate – заражать, загрязнять

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What education did Einstein get?
2. What did Einstein get the Nobel Prize for?
3. What things made his own happiness?
4. What element was named in his honour?

ALBERT EINSTEIN

Albert Einstein is known all over the world as a brilliant theoretical physicist and the founder of the theory of relativity. He is perhaps the greatest scientist of the 20th century. Some of his ideas made possible the atomic bomb, as well as television and other inventions. He was born in 1879 in a small German town. The Einsteins soon moved to Munich, where Albert went to school. Neither his parents, nor his school teachers thought much of his mental abilities. In 1895 Albert entered a technical college. After graduating from it he started to work at the Swiss Patent Office in Bern. In 1905 Einstein wrote a short article in a science magazine. This was his "Special Theory of Relativity" which gave the world the most famous equation relating mass and energy – the basis of atomic energy.

Later he became a professor in several European universities. After ten years of hard work he created his "General Theory of Relativity".

In 1921 Einstein received the Nobel Prize for Physics. Einstein's Theory of Relativity is now the cornerstone of modern physics. Many physical phenomena could never be explained without this discovery. He gave a logical explanation of the photoelectric effect. He gave all his life to the increase of human knowledge.

Einstein impressed everybody as being a very happy man. He made his own happiness out of such simple things as his work, his violin and his boat.

Einstein died in 1955. The artificial element einstenium has been named in his honour.

Vocabulary:

theory of relativity – теория относительности
as well as – а также
neither ... nor – ни … ни
enter a college – поступать в колледж
equation – уравнение
relate – относиться к ч.-л.
cornerstone – краеугольный камень
phenomenon (мн. ч. phenomena) – явление
impress – поражать
increase – увеличение
artificial – искусственный

in honour – в честь

II. Переведите текст в письменной форме.

III. Определите время и залог сказуемого, переведите следующие предложения:

1. He was given the patent for this invention by the Russian Government.
2. The lecture will be followed by a film about a talented scientist.
3. We are taught some special subjects in the second year.
4. Plastics are widely used in engineering.
5. Wind, water and animals were used to provide energy.

IV. Подчеркните модальные глаголы и их эквиваленты, переведите предложения:

1. The technologist is to solve practical problems.
2. The scientist has to design products, machines and production systems.
3. The engineer can work in a design bureau.
4. Students must attend lectures regularly.
5. You may operate this device.

V. Переведите предложения:

1. Some of Einstein's ideas made possible the atomic bomb, television and other inventions.
2. Hydroelectric plants are considered to cause some serious problems in the environment.
3. There are no specialized plants in his town.
4. Are there any good restaurants near here?
5. May I use your computer? I have some e-mails to send.

VI. Подчеркните инфинитив и переведите предложения:

1. Albert Einstein gave all his life to increase human knowlwdge.
2. In order to create his General Theory of Relativity Albert Einstein has worked hard for many years.

3. She bought a computer to use it for her research.
4. This problem is too complex to be solved by students.
5. In order to obtain enormous amounts of energy we are building powerful atomic electric stations.

Вариант 3

Прочитайте и переведите текст устно:

THE PARTS OF A COMPUTER SYSTEM

In order to use computers effectively to solve problems in our environment, computer systems are devised. Computer systems may be discussed in two parts.

The first part is hardware – the physical, electronic, and electromechanical devices that are thought of and recognized as "computers". The hardware consists of Central Processing Unit (CPU), input devices and output devices. The CPU is made up of a processor and a main memory, or main store. The processor carries out or executes instructions in the program. The main memory stores input data and the program needed by the processor. The main memory also holds output data or the results of processing.

Input devices are used to provide data for the CPU. The keyboard is a common data input device. By using a keyboard a user can enter data directly into the computer system. Data is sometimes entered on cards. The cards are read by an input device called a card reader. Data is often input from a mass storage device, such as magnetic tape or magnetic disc. A mass storage device has a much larger capacity than main memory. That is, it can store more data. The tapes or discs are read by an input device called a tape drive or a disc drive.

Output devices receive data from the CPU. Sometimes the output data is transmitted along a telephone line to another computer. Output data can also be stored for future use on a mass storage device, such as magnetic tape or magnetic disc.

Input devices, output devices and mass storage devices are collectively called Input-Output Devices (I/O Devices), or peripherals.

The second part is software – the programs that control and coordinate the activities of the computer hardware and that direct the processing of data.

For the computer system to operate, computer programs are required. A computer program is a set of instructions for the CPU. These instructions tell the CPU where to find the input data in the system. The CPU is also instructed how to process the data and where to put the results. Programs are not hardware, as they have no electrical or mechanical components. They can be easily changed according to the needs of the user.

Computer software can be divided into two very broad categories – systems software and application software.

Vocabulary:

in order to – для того, чтобы
to devise – изобретать, придумывать
hardware – аппаратное обеспечение
device – устройство
Central Processing Unit (CPU) – центральный процессор
input device – устройство ввода
output device – устройство вывода
main memory – оперативная память
to execute – выполнять
data – данные, информация
processing – обработка
keyboard – клавишный пульт
user – пользователь
storage – память, запонимающее устройство
capacity – емкость
disc drive – дисковое запоминающее устройство
peripherals – вспомогательные устройства
software – программное обеспечение

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What subjects did Sophia study in childhood? What subject did she show an unusual gift in?

2. Why did she leave Russia and continue her education abroad?
3. What problems did Kovalevskaya solve in her numerous scientific works?

THE FIRST RUSSIAN WOMAN-SCIENTIST

The great Russian mathematician, Sophia Kovalevskaya lived and worked in the second half of the 19th century. It was the period of Russia's progress in science and culture.

Sophia was born in Moscow on February 15, 1850 in a well-off family but spent her chilhood in a village. Her father, a well-educated person himself, gave a good education to his children. When Sophia was eight an experienced teacher taught her arithmetic, grammar, literature, geography and history. The girl showed an unusual gift in mathematics.

In 1867 Sophia wanted to continue her studies in St. Petersburg, where her family spent winters. But it was impossible for a woman to attend lectures at the University. Even Chebyshev who at that time headed the Russian mathematical school had no right to allow her to attend his own lectures. The only way out for her was to go abroad, but in this case there was a condition that the woman should be married. Sophia married Vladimir Kovalevsky and soon left Russia.

In 1871 the Kovalevskys went to Berlin. During four years in Berlin Sophia wrote three dissertations. When three scientific masterpieces by Kovalevskaya appeared in 1874, Hettingen University awarded her the Degree of Doctor of Philosophy.

On her return to Russia she vainly tried to get a post at St. Petersburg University. The tsarist Government didn't want to have women-professors.

In 1883 she accepted the offer of Stockholm University and was elected professor of mechanics and held this post until her death in 1891. In her numerous scientific works Kovalevskaya solved the problems which many scientists couldn't solve during many years.

Vocabulary:

well-off family – состоятельная семья
experienced – опытный
the only way out for her – единственный выход для нее
the woman should be married – женщина должна быть замужем
masterpiece – шедевр

post – должность
offer – предложение

II. Переведите текст в письменной форме.

III. Определите время и залог сказуемого, переведите следующие предложения:

1. The Technical University is made up of 11 faculties.
2. This plant was built only 5 years ago.
3. Large quantities of steam are required by modern industry.
4. The new grammar rule will be asked at the next lesson.
5. The students were shown different kinds of motors in operation.

IV. Подчеркните модальные глаголы и их эквиваленты, переведите предложения:

1. The scientist had to work much before he was able to complete his research.
2. You should turn off the light before you leave the flat.
3. Every engineer must know at least one foreign language.
4. We were to send his letter of recommendation by e-mail.
5. They could easily define the properties of this material.

V. Переведите предложения:

1. Even Chebyshev who at that time headed the Russian mathematical school had no right to allow Sophia Kovalevskaya to attend his own lectures.
2. I am having some problems at work.
3. You may take any of these books.
4. This scientific research Institute has some specific features in its work.
5. Are there any new instruments in your laboratory? – Yes, there are some.

VI. Подчеркните инфинитив и переведите предложения:

1. To study at the University was impossible for a woman at that time.

2. Sophia married Vladimir Kovalevsky in order to go abroad and to study in Berlin.
3. Sophia Kovalevskaya returned to Russia to get a post at St. Petersburg University.
4. In order to use computers effectively, to solve problems in our environment computer systems are devised.
5. She went to the bank to get some money.

Вариант 4

Прочитайте и переведите текст устно:

FOUR INDUSTRIAL REVOLUTIONS

The history of mechanical engineering goes back to the time when the man first tried to make machines. We can call the earlier rollers, levers and pulleys for example the work of mechanical engineering.

Mechanical engineering as we understand it today starts from the first Industrial Revolution.

People have labelled as “revolutions” three episodes in the industrial history of the world and now we are entering the fourth.

The first industrial revolution took place in England between 1760 and 1840. metal became the main material of the engineer instead of wood and steam gave man great reserves of power.

In the second revolution from 1880 to 1920 electricity was the technical driving force. It provided power for factories that was easier and cheaper to control than steam. It was marked also by the growing importance of science-based industries such as chemicals and electrical goods and the use of scientifically-designed production methods such as semi-automatic assembly lines.

The third industrial revolution coincided with the advent of automation – in its inflexible form. In this revolution the main features were advances in the control of manufacturing processes so that things could be made more cheaply, with greater precision and (often) with fewer people.

What is the fourth industrial revolution? The fourth industrial revolution will be characterized by automated machines that are versatile

and programmable and can make different things according to different sets of computer instructions.

Vocabulary:

mechanical engineering – машиностроение
to enter – вступать, входить
to take place – происходить
main – основной, главный
instead of – вместо
power – энергия, сила, мощность
to drive – приводить в движение
engine – двигатель
force – сила
to provide – обеспечивать
cheap – дешевый
to mark – замечать
semi-automatic – полуавтоматический
to coincide – совпадать
advent – приход, появление
inflexible – негибкий
feature – особенность
advance – успех, прогресс
to occur – происходить
influence – оказывать влияние на
versatile – гибкий
according to – согласно
sets of computer instructions – программы компьютера

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. What did Lobachevsky become interested in when he was still a schoolboy?
2. Was Lobachevsky famous for his works in medicine?
3. What sciences did Lobachevsky's ideas influence?

NIKOLAI IVANOVICH LOBACHEVSKY

N.I. Lobachevsky is a great Russian mathematician and the creator of non-Euclidean geometry. He was born on December 1, 1792 in Nizhni Novgorod in a poor family. In 1807 he entered Kazan University. At the University N.I. Lobachevsky spent the next forty years of his life as a student, professor and rector.

Lobachevsky became interested in mathematics when he was still a schoolboy and he remained true to this science all his life long.

Lobachevsky did a lot to make Kazan University a first-rate educational institution of that time. At the same time he made extensive researches into mathematics.

On February 23, 1826 a great event took place at Kazan University. N.I. Lobachevsky presented a paper demonstrating the theorem of parallel lines. That day a new geometrical system, the so-called non-Euclidean geometry was born.

In the years that followed Lobachevsky wrote a number of works in the field of algebra and mathematical analysis. However, nearly nobody understood and recognized his works at that time. They were recognized only twelve years after his death.

Lobachevsky's ideas greatly influenced the development not only of geometry and other mathematical sciences, but also mechanics, physics and astronomy. One British mathematician called Lobachevsky "Copernicus of Geometry".

Vocabulary:

non-Euclidean geometry – неэвклидова геометрия (Эвклид – древнегреческий философ)
to enter Kazan University – поступить в Казанский университет
to become interested in – заинтересоваться
to remain true to – оставаться верным ч.-л.
to do a lot – сделать многое
first-class – первоклассный
the same – тот же самый
in the years that followed – в последующие годы
a number of – несколько
Copernicus – Коперник

II. Переведите текст в письменной форме.

III. Определите время и залог сказуемого, переведите следующие предложения:

1. These poems were translated from English into Russian by S. Marshak.
2. A new pneumatic system was invented in 1989.
3. The machine-tool is mounted on a work bench.
4. Precise data will be indicated in a special table.
5. These problems are often discussed by students.

IV. Подчеркните модальные глаголы и их эквиваленты, переведите предложения:

1. You were to replace the tool by another one, why didn't you do it?
2. This new minibus can hold 18 passengers.
3. The engineer should apply his theoretical knowledge to practice.
4. Industry must recognize that a graduate will need training in the specific field.
5. You may use this instrument for measuring gas pressure.

V. Переведите предложения:

1. N.I. Lobachevsky wrote some works in the field of algebra and mathematical analysis.
2. Our chemical laboratory makes no researches in the field of mechanical engineering.
3. I couldn't find any English newspapers at the shop.
4. They carry out some interesting experiments.
5. There aren't any good programmes on TV in summer.

VI. Подчеркните инфинитив и переведите предложения:

1. In order to develop mathematical sciences N.I. Lobachevsky made extensive researches in this field.
2. He phoned her yesterday to organize the meeting because there were problems.
3. Carbon is used to make the physical qualities of the metal better.

4. To prepare metals for practical use requires much knowledge and experience.
5. They discovered ways to refine metals.

Вариант 5

Прочитайте и переведите текст устно:

THE HIGHER SCHOOL AND THE WAYS TO SCIENCE

Students participation in research is one of the most effective methods for training highly-qualified specialists capable of taking part in the rapidly developing scientific and technological revolution.

Research enables the students to improve their knowledge and put to practical use the things they learn at lectures, seminars and laboratories. Furthermore, it enables them to realize the practical value of their knowledge, to learn how to handle the modern equipment and analyse the results of the experiment.

There are student research societies at every university and institute. Competitions and exhibitions based on student research have become an established tradition. Every year a country-wide student contest is held for the best research project, the winners being awarded special medals and diplomas.

Students are engaged in research under the guidance of professors, instructors, engineers and post-graduates. As a rule students write their term papers and graduation theses on the problems of their research work. They operate experimental and industrial installations, conduct theoretical investigations, read scientific literature on their speciality.

Many term papers and graduation theses include elements of research done at some higher school department on contract with industrial enterprises. Term papers, research work, graduation theses of practical importance to industry – such are the stages of turning students into highly-skilled thinking engineers ready for independent work even before they get their diplomas.

Vocabulary:

to participate in – участвовать в чем-либо

training – подготовка
capable – способный
to enable – давать возможность
to improve – улучшать
to realize the value of – определить ценность
to handle equipment – управлять оборудованием
society – общество
contest – конкурс
to hold (held) – проводить
to award – награждать
to engage – заниматься
as a rule – как правило
to operate installations – управлять установками
term papers – курсовые работы
graduation theses – дипломные работы
importance – важность
independent work – самостоятельная работа

I. Прочитайте текст и ответьте письменно на следующие вопросы:

1. When did Faraday discover the laws of electrolysis?
2. Where does the starting motor draw electricity from?
3. Whose works are based on the discoveries made by Faraday?

FARADAY PUTS ELECTRICITY TO WORK

Michael Faraday, who was born in 1791 and died in 1867, gathered together and set in order all the work of the scientists who had worked on electrical problems before him.

In 1823, he discovered how to make an electrical motor. In 1831, he built the first generator, then called dynamo. The modern car has both a starting motor and a generator. The starting motor draws electric current from the car battery to start engine. The generator is driven by the engine to recharge the battery and to furnish electric power for all the electrical conveniences in the car.

In 1833 Faraday discovered the laws of electrolysis.

The works of many other scientists were influenced by the discoveries made by Faraday. As a result of Faraday's work Morse was

able to invent the electromagnetic telegraph; Bell – the telephone and Edison – the electric light. Their inventions have profoundly changed the lives of nearly everyone in the world. Thus, Edison's Congressional Medal of Honor certificate declared: "He illuminated the path of progress by his invention".

Vocabulary:

to set in order – приводить в порядок; *зд.* обобщить
starting motor – стартер
to start engine – запустить двигатель
to drive – приводить в движение
to recharge – перезаряжать аккумулятор
to influence – влиять
nearly – почти
Medal of Honour – почетная медаль
to furnish electric power – снабжать электрической энергией
to invent electric light – изобрести электрическое освещение

II. Переведите текст в письменной форме.

III. Определите время и залог сказуемого, переведите следующие предложения:

1. Modern methods of teaching are hotly debated now.
2. The reaction will be greatly influenced by gas temperature.
3. The theatre building was completed in 2007.
4. The electric lamp was invented by Yablochkov.
5. Our Institute is made up of 6 faculties.

IV. Подчеркните модальные глаголы и их эквиваленты, переведите предложения:

1. The technologist is to investigate the unknown.
2. The engineer must apply engineering tables and formulas in his work.
3. All the units of a new tractor can be produced at this plant.
4. They have to pay for their education.
5. He was able to do this task himself.

V. Переведите предложения:

1. Many term papers and graduation theses of students include elements of reserch done at some higher schools on contract with industrial enterprises.
2. He didn’t give her any information.
3. Joe speaks no foreign languages.
4. There are some interesting inventions at the research centre.
5. Their team didn’t win any matches last year.

VI. Подчеркните инфинитив и переведите предложения:

1. The starting motor draws electric current from the car battery to start engine.
2. To pass his physics exam he studies hard.
3. They have enough money to stay in that hotel.
4. In order to be trained at the Institute he paid for his education.
5. To see Buckingham Palace he must go to London.

ТЕКСТЫ ПО СПЕЦИАЛЬНОСТЯМ

Специальность «Технология машиностроения»

Text 1

PROPERTIES OF METALS

The metals resemble one another in their general chemical behaviour with other substances, but they differ markedly in activity.

The uses to which metals are put are based upon their physical or chemical properties. The metals vary greatly in density. The lightest is lithium, which has the density of 0.534 and is, therefore, about one-half as heavy as water. The heaviest is osmium (D. 22.48) which is closely related to platinum (D. 21.45) in physical and chemical properties. The so-called light metals, of which sodium, potassium, magnesium and aluminium are examples have a density less than 4; iron, lead, tin, silver, etc. are known as heavy metals.

The metals also vary in hardness, from potassium which can be molded like wax to chromium, which will cut glass. The metals and other substances differ in the extent to which they can resist a strain that tends to bring about a permanent change in their form. All substances offer more or less resistance to the flow of an electric current through them. With any given substance the resistance is determined by its dimensions and the temperature.

The solids obtained when two or more metals are mixed in the molten condition and allowed to solidify are called alloys. Each constituent of an alloy is called a component. Alloys may be binary (two-component), ternary (three-component), etc. The ability of various metals to form alloys differs greatly.

Vocabulary:

to vary – отличаться
extent – степень
to bring about – *зд.* производить

Text 2

MECHANICAL TOOLS

Both in maintenance and repair of machines all kinds of fitting operations are applied. An important role is played by disassembling and assembling operations. Special instruments are used for performing these operations.

Among the variety of mechanical tools used for disassembling and assembling machine parts and in their repairing are wrenches. According to their construction and application wrenches may be of different types: single-ended and double-ended nut wrenches, adjustable wrenches, socket wrenches and special wrenches.

A nut wrench is used for screwing and unscrewing nuts. It consists of a handle and a head with an opening known as the span. Adjustable wrenches are applied for unscrewing nuts and bolts of different dimensions.

Socket wrenches are used in cases when nuts or bolts are located in recesses and are hardly accessible for a nut wrench.

Special wrenches are used for unscrewing and screwing nuts of a definite type. Wrenches are used by drivers for repairing cars, in locksmith's shops and fitter's shops. Fitters use them to screw different types of machine parts as: washers, bolts, shafts, etc. Plumbers use them to repair pipes, taps, etc.

Besides different types of wrenches there are round pliers or needle nose pliers which are widely used by locksmiths, electricians and other specialists for gripping, screwing or cutting off thin metal and wires.

Vocabulary:

maintenance – обслуживание
repair – ремонт
to assemble – собирать
to disassemble – разбирать
wrench – гаечный ключ
socket wrench – торцовый ключ
nut wrench – гаечный ключ
to screw – завинчивать
to unscrew – отвинчивать
fitter – слесарь-сборщик

washer – шайба
shaft – вал
round pliers – круглогубцы
needle nose pliers – игольчатые кусачки

Text 3

DRILLS AND DRILLING

Drilling is one of the cutting operations producing cylindrical holes of different diameter in solid material by means of rotating tools called “drills”.

The most common type of drill in use is the twist drill made of a tempered steel round bar stock. Twist drills are made with two, three or four spiral grooves or flutes milled from the solid. These grooves or flutes winding around the body of the drill serve for forming the cutting edges of the drill, as well as for removing the chips formed in drilling from the hole.

The twist drill comprises three principal parts: body, shank and point. The twist drill has two cutting edges known as the “lips”. These cutting edges or lips are connected by a third edge, called a “web”. It is this part that gives rigidity and strength to the drill. When in use the first two cutting edges remove the material from the work, while the third one penetrates into the material by rubbing rather than cutting.

In order to drill holes in a metal the cutting edges of a drill should be correctly ground to a certain angle. When a drill is ground correctly, its cutting edges or lips should have equal length, whereupon each of them should make the same angle with the center line. Otherwise the drill will make holes the diameter of which is larger than that of the drill. This may disable the drill and cause an undesirable waste of material. Drills have shanks of various types, the most commonly used being those having straight and tapered shanks. The shanks of the drill serve for clamping the drill either in the chuck spindle or socket of a drilling machine. The above part of the drill may be either of a cylindrical shape, like in straight-shank drills, or of tapered shape in tapered-shank drills.

The third part of the drill is called a “drill point”. It is always ground to a cutting angle varying with the kind of material to be drilled. For hard materials this cutting angle equals 140° and for soft materials it equals 90°. The cutting edges of flat drills used for drilling holes in steel or in cast iron are ground to an angle of 100° to 120°.

Vocabulary:

drill – сверло
drilling – сверление
hole – отверстие
twist drill – спиральное сверло
chips – стружка
body – корпус
point – наконечник
lip – кромка
shank – хвостовик
to connect – связывать
web – перемычка
rigidity – жесткость
strength – прочность
in order to – для того, чтобы
grind (ground, ground) – затачивать
disable – вывести из строя
various – разный
whereupon – после чего
socket – патрон
90° - ninety degrees – 90°

Специальность «Автомобили и тракторы» «Автомобили и автомобильное хозяйство»

Text 4

ENGINES

The heat engine is a machine that converts heat energy to mechanical energy. The engines of motor-cars, motorcycles, farm tractors, motor boats, etc. are heat engines, which belong to the subgroup of internal combustion engines. Combustion engines may be divided into several types according to the number of piston strokes. Most of modern automotive engines operate on four-stroke cycle. There are also engines which operate on two-stroke and six-stroke cycles.

A diesel engine is a machine which produces power by burning oil in a body of air which has been squeezed to a high pressure by a moving piston. Diesel engines are especially suitable where an independent source

of power is required, as in ships, locomotives, mobile equipment of all sorts and isolated power plants.

Steam, gas and oil engines were known and used prior to the invention of the diesel engine. The steam engine converts the heat energy of steam to mechanical energy. A typical steam reciprocation engine consists of a cylinder fitted with a piston. A connecting rod and crankshaft change the piston to-and-fro motion into rotary motion. The steam pressure on the piston varies during the stroke, and it is a flywheel which maintains a constant output velocity.

Vocabulary:

subgroup – подгруппа
piston – поршень
stroke – ход поршня, такт
to squeeze – сжимать
reciprocation engine – поршневый двигатель
to fit – *зд.* снабжать
to-and-fro motion – возвратно-поступательное движение
output – выход

Text 5

COMPONENTS OF THE AUTOMOBILE

Automobiles are trackless, self-propelled vehicles for land transportation of people or goods, or for moving materials. There are three main types of automobiles. These are passenger cars, buses and lorries (trucks). The automobile consists of the following components: a) the engine; b) the framework; c) the mechanism that transmits the power from engine to the wheels; d) the body.

Passenger cars are, as a rule, propelled by an internal combustion engine. They are distinguished by the horsepower of the engine, the number of cylinders in the engine and the type of the body, the type of transmission, wheelbase, weight and overall length.

There are engines of various designs. They differ in the number of cylinders, their position, their operating cycle, valve mechanism, ignition and cooling systems.

Most automobile engines have six or eight cylinders, although some four-, twelve-, and sixteen-cylinder engines are used. The activities that

take place in the engine cylinder can be divided into four stages which are called strokes. The four strokes are: intake, compression, power and exhaust. “Stroke” refers to the piston movement. The upper limit of piston movement is called top dead center, TDC. The lower limit of piston movement is called bottom dead center, BDC. A stroke constitutes piston movement from TDC to BDC or from BDC to TDC. In other words, the piston completes a stroke each time it changes the direction of motion.

Vocabulary:

self-propelled – самоходный
horsepower – мощность, лошадиная сила
wheelbase – колесная база
activities – *зд.* процесс
time – раз
intake – всасывание, впуск
power stroke – рабочий ход

Text 6

TRACTOR MAINTENANCE

Efficient and trouble free operation of the tractor may be ensured when the tractor driver is perfectly familiar with the design of the tractor and properly performs all maintenance operations. The better the maintenance of the tractor, the more hours it will work before repairs and the easier for the tractor driver to fulfil his task. Tractor maintenance includes daily and regular checking of the condition, adjustment and lubrication of the tractor units and mechanisms. Correct and timely lubrication of friction surfaces of tractor parts significantly lowers their wear and ensures continuous and reliable operation of all mechanisms. The tractor is lubricated in conformance with the directions in the Lubrication Chart.

Tractor operation becomes very complex at low temperatures (plus 5 degrees C and lower) due to the worsening of working conditions of the fuel system, lubricating system and cooling system of the engine. The danger arises of scoring of bearings, difficult starting of both the starting and diesel engines. To ensure continuous tractor operation in winter conditions timely, before the beginning of frosts, completely prepare the

tractor for passing to winter operating and when frosts begin, change the summer grades of fuel and lubricant by winter grades.

Vocabulary:

to ensure – обеспечивать
properly – соответственно
maintenance – обслуживание
to repair – ремонтировать
to fulfil – выполнять
to include – включать (в себя)
lubrication – смазка
to check – проверять
unit – узел, агрегат
timely – своевременно
wear – износ
direction – направление
bearing – подшипник
grade – сорт

Специальность «Электроснабжение промышленных предприятий»

Text 7

ATOMS

The story of atoms goes back to the time of the Greek thinker Democritus (about 460-370 B.C.). He thought all substances to be made up of tiny particles or atoms which could not be further divided. He thought that there were only four elements: fire, earth, air, and water. The theory of the ancient Greeks was not confirmed by further discoveries in science.

Everything including man is made up of atoms.

Bohr believed the atom to consist of two parts: a massive central core or nucleus in which the charge of positive electricity was concentrated and smaller particles called electrons that surrounded the core and in which the charge of negative electricity was concentrated.

This model of the atom resembled our solar system. The nucleus could be compared to the sun and the electrons could be compared to the

planets that circle about the sun.

The nucleus and electrons in the atom are held together by the mutual electrical attraction between the positive nucleus and the negative electrons. The positive and negative electrical charges neutralize each other so that the atom as a whole is electrically neutral.

In Bohr's model the nucleus was made up of protons. Each proton carried one positive charge of electricity. Each electron circling about the nucleus carried one negative charge of electricity. For the atom to be electrically neutral, therefore, the number of protons must be equal to that of electrons.

Modern atomic theory says that each atom has at its center a nucleus consisting of protons and neutrons. Electrons are orbiting the nucleus. Every atom consists almost entirely of empty space, its size being indicated approximately by the orbit of the outermost electron. Most of the mass of an atom is in the nucleus.

Electrons are extremely light as compared with protons and neutrons which have nearly the same mass; the mass of an electron is only about 1/1840 the mass of a proton.

Electrons are negatively charged and are held in the atom because protons have an equal but positive charge. Neutrons have no electric charge. The atom is electrically neutral, so that the number of orbital electrons it has must equal the number of protons in the nucleus. This number which is important because it "identifies" a chemical element, is called the atomic number and is sometimes represented by the symbol *z*.

Ninety kinds of atoms with varying chemical properties occur naturally on the earth. They are chemical elements, such as hydrogen, oxygen, carbon, gold, uranium and so on.

Vocabulary:

to put forward – выдвигать
to go back – *зд.* относиться
once – когда-то
to circle – вращаться
as a whole – в целом
as compared – по сравнению
occur naturally – встречаться в природе

Text 8

CONDUCTORS AND INSULATORS

The major difference between atoms is the distribution of the electrons and the total number of protons. Therein lies the difference between the nature and behaviour of the various kinds of elements. From the electrical viewpoint, there is another difference between atoms which is associated with the behaviour of the planetary electrons.

While it is true that the protons within the nucleus display a powerful attracting force upon the planetary electrons and the electrons have a like attraction for the protons, this force is not the same in all atoms. In some atoms the outer electrons are often under the influence of some external force, such as collision between atoms or extreme agitation of the atoms. They will fly out of their orbit or be knocked out of it and so leave the atom. When this happens, the atom which is shy of one or more electrons, will attract other electrons. At the same time the electrons having been freed from some atoms, may become attached to other atoms which were originally electrically neutral, thus making them more negative and giving them a tendency to repel other electrons. Such movement of electrons is continually taking place between the atoms of a substance, especially in metals.

The greater the numbers of such free electrons in a substance, the better that substance is a conductor of electricity. Free electrons are extremely abundant in metals of all kinds. The atoms of an insulator hold on to their electrons with extreme tenacity. The atoms of certain gases are of such a type that an easy liberation of electrons from the atoms of the gas occurs. This plays a dominant role in the operation of some vacuum tubes.

An atom which has an excess of positive electricity within it, due to the loss of one or more planetary electrons, is called a positive ion; whereas an atom which has an excess of electrons is called a negative ion. The process of producing ions is known as ionization.

Vocabulary:

viewpoint – точка зрения
to attach – присоединять(ся)
the greater … the better – чем больше … тем лучше
excess – излишек
due to – из-за

Text 9

THE ACCUMULATOR

If a large current is required for several hours, an accumulator or secondary cell is used. The most common form is the lead – acid accumulator which has a plate containing lead peroxide (chocolate – brown in colour) and a plate containing lead (slate – grey in colour) both plates being immersed in sulphuric acid. The lead peroxide is the positive pole, the lead is the negative one. No depolarizer is necessary. The accumulator can be easily recharged when run – down where as the primary cells are of little value thereafter.

After the accumulator has been used for many hours, chemical changes occur, the density of acid drops and e.m.f. falls too. In this condition the accumulator will be damaged if it is used further. The cell is therefore "recharged" by passing an electric current through it in the opposite direction to the way in which the current was supplied during the cell's use. This is achieved by connecting the positive terminal of a direct voltage supply to the positive pole of the accumulator and the negative terminal to the negative pole. A rheostat is essential in the circuit to control the amount of current passing through the accumulator which is registered by an ammeter. The special gravity of the acid is tested with a bulb hydrometer. If it corresponds to the necessary value, the accumulator is considered to be recharged and is ready for use again.

The capacity of an accumulator is a measure of the electric charge it can drive around an external circuit once it has been fully charged. This should be logically measured in coulombs but it is more usual to use a larger unit called an ampere-hour. This is the amount of electric charge which moves when a steady current of 1 ampere flows for 1 hour.

The lead-acid accumulator is very efficient. The chief disadvantages are the high weight-to-capacity ratio, the corrosive nature of the acid and the gradual falling away of the active material from their electrodes limiting the life to only a few years. The chief merit is the constancy of the e.m.f. over the greater part of the discharge period. More modern types of accumulators have a lower weight-to-capacity ratio and a longer life but they do not show the same constancy of e.m.f. during discharge. The lead-acid type is therefore in common use.

Vocabulary:

to recharge – перезаряжать
e.m.f. – electromotive force – ЭДС
to supply – снабжать
hydrometer – ореометр
disadvantage – недостаток
weight-to-capacity ratio – соотношение веса и емкости
a longer life – более длительный срок службы

Специальность «Промышленное и гражданское строительство»

Text 10

BUILDING MATERIALS

WHAT IS THE CHEMISTRY OF BUILDING MATERIALS?

Lime, Mortar, Cement and Bricks. Calcium oxide, CaO, usually called “lime”, reacts with water to form calcium hydroxide. It is the cheapest of all bases. Builders use enormous quantities of it for mortar and plaster.

What do we mean by lime?

It really means calcium oxide. Other names for this quick compound are quicklime and unslaked lime.

Quicklime is a white solid that reacts violently with water. If you add just a little water to a lump of quicklime, you will be surprised at the result. The lime cracks, swells up, gives off steam, and acts as though it were alive. That is why it is called “quick”.

How is lime made? It is made by heating limestone in a special kind of furnace called a “kiln”. Lime must be stored in a dry place. Otherwise it will absorb moisture.

Mortar is a pasty mixture of slaked lime, sand, and water. A little cement may be added to it, especially for underground foundations. The mortar quickly sets into a hard, rocklike solid.

There are three reasons why it hardens: (1) it loses water by evaporation, (2) carbon dioxide from the air unites slowly with the calcium hydroxide to form a mass of calcium carbonate, (3) the calcium hydroxide also unites very slowly with some of the small particles of sand, forming calcium silicate.

What is plaster? We usually put plaster on the walls or ceilings of our homes in two coats. The first, or undercoat, is much like mortar, except that it has hair or wood fibre added to it. This makes it hold together better until it has hardened. The second, or finish coat, is a mixture of calcium hydroxide, water, and a powder called “plaster of Paris”. The finish coat dries quickly on a smooth, hard surface.

How do we make cement? We make cement from limestone and clay. These are cheap and plentiful raw materials. However, it takes a great deal of power and fuel to make cement, besides big, heavy machines for heating and grinding the raw materials. First limestone and clay are ground and mixed together. Then the powder mixture of raw materials is charged in the upper end of a cement kiln that revolves slowly. Fuel oil or powdered coal blown in at the lower end of the kiln is burned to supply the heat needed to begin to melt the mixture. At this temperature the mixture forms small lumps about the size of peas. The lumps drop out of the lower end and go to machines that grind them into a powder. This makes the finished cement.

The finer the grinding the harder the concrete we can make from the cement.

What is concrete? We make concrete by mixing cement, sand, gravel and water together in the right amounts. The concrete is poured into forms that hold it in place until it hardens. The hardening is probably due to crystals forming in the concrete. They stick together and make a very hard artificial stone. Sometimes we embed steel rods in the cement mixture to make it stronger. This is reinforced concrete. In the building industry, cement was used with steel in foundations. It was mixed with sand and gravel, and reinforced with steel for floors and for floor arches. In this form it became a new material – reinforced concrete.

When the concrete hardens and sets, there is a resultant material of great strength.

What are plastics? A plastic is any substance that we can form or shape by molding. Probably clay was the first plastic that men used. Many centuries ago they learned to shape it into blocks which they baked into bricks. Later on, they learned how to make glass, which is a plastic at a high temperature. Rubber is a plastic that we form into desired shapes, and then “set” by vulcanizing.

Properties determine the uses of plastics. Such properties as resistance to acids, bases, water, oils and organic solvents are very important. Combustibility, electrical insulating properties, desirable optical

properties, hardness, strength, toughness, and ease of machining are other properties to be considered.

Iron, steel and aluminium are used in the construction of bridges, buildings, and reinforced highways. The introduction of structural steel and aluminium brought significant changes in building technology. It marked for all time a turning point in construction science.

Vocabulary:

to mean – иметь в виду
quicklime – негашеная известь
violently – бурно
to give off – отдавать, выделять
kiln – обжиговая печь
evaporation – испарение
carbon dioxide – двуокись углерода
calcium hydroxide – гидроокись кальция (гашеная известь)
calcium carbonate – углекислый кальций
calcium silicate – силикат кальция
undercoat – грунтовка
wood fibre – древесное волокно
finish coat – отделочный слой
plaster of Paris – алебастр
to grind – измельчать
lump – кусочек, гранула
stick together – слипаться
reinforced concrete – железобетон
base – основание
acid – кислота
combustibility – воспламеняемость

Специальность «Машины и технология литейного производства»

Text 11

SOME WORDS ABOUT METALLURGY

Metallurgy is one of the oldest of arts but one of the youngest of sciences. Many of our metals were known in ancient times, but it is only

within the last century or two that the knowledge of the properties of the metals has made it possible to apply them to any extended way for industrial purposes.

With the development of physics of metals, metallography, theory of heat treatment and other phases of the science of metals the field of metallurgy has broadened.

Metallurgy in this broader sense falls into three divisions: chemical or extractive, physical and mechanical. Chemical metallurgy includes the metallurgical processes involving chemical change and the methods of productions and refining.

Physical metallurgy includes the processes which deal with the nature, structure and physical properties of metals and alloys.

Mechanical metallurgy includes the processes of working and shaping metals-processes which do not involve chemical changes.

Vocabulary:

extractive – добывающий
working – обработка
shaping – формовка

Text 12

STEEL

Strength, ductility, cheapness and machinability are the four most important industrial and commercial properties of steel.

Carbon steel contains small quantities of manganese, phosphorus and silicon. Each of these elements effects the physical properties of steel. The most important influence of carbon is in connection with the hardness, strength and ductility of the metal.

Manganese comes directly after carbon in importance. It improves rolling and forging qualities of metal and at the same time minimizes the harmful effect of sulphur.

Phosphorus acts somewhat like carbon in that, that it increases tensile strength and hardness while decreasing ductility.

Silicon is an excellent deoxidizer or cleaner of steel.

Vocabulary:

carbon steel – углеродистая сталь
tensile strength – удельная прочность
deoxidizer – раскислитель, восстановитель

Text 13

ALLOY STEELS

When one or more metals are added to plain carbon steel, the steel acquires certain new characteristics. Depending upon the metals added and the amount of each, the steel becomes stronger, tougher, harder, more heat-resisting, more resistant to corrosion or acquires some other special properties. Such steels are called alloy steels.

Manganese, nickel and silicon make the steel stronger, tougher or more corrosion-resistant.

Chromium, molybdenum and vanadium in combination with carbon make the steel harder and stronger.

Silicon, manganese and titanium purify the steel ridding the metal of harmful impurities.

Aluminium and zirconium counteract harmful oxides or gases.

Vocabulary:

alloy steel – легированная сталь
to purify – очищать
to rid of – освобождать(ся)
impurity – примесь

Специальность «Машины и аппараты пищевых производств»

Text 14

FROM THE HISTORY OF THE FOOD INDUSTRY

The food industry is a very ancient industry. Almost every branch of the food industry and particularly those dealing with grain and bread, meat and meat products, fish and fish products, was a well defined trade guild.

The food industry developed from the experience of generations.

Milling and baking were well developed in ancient times. There were both private and public ovens for baking bread. Olive oil and honey were widely sold and bought. Cheese was manufactured thousands of years ago.

The production of food, as an industry, actually has a history extending as far as the history of modern chemistry because it was considered a part of chemical technology.

Let's take some examples. In 1747 Marggraf discovered crystals of sugar in the red beet. She suggested that it might be possible to extract it on a commercial basis. Kirchhoff offered the use of starch for sugar production in 1811.

The food industry developed in full with the growth of the processing industries and with improvement in food machines, transportation, refrigeration, storage and packaging.

Vocabulary:

food – пища
branch – отрасль
particularly – особенно
grain – зерно
to define – определять, устанавливать
milling – мукомолье, помол
baking – хлебопечение
oven – хлебопекарная печь
starch – крахмал
cane – сахарный тростник
beet – свекла
wine making – виноделие
beer brewing – пивоварение
vinegar – уксус
essential oil – эфирное масло
commercial – промышленный
storage – хранение
packaging – упаковка
processing industry – перерабатывающая промышленность

Text 15

EDUCATION AND TRAINING OF PERSONNEL FOR THE FOOD INDUSTRY

Education plays a great role in the life of the people. There are institutes training engineers and technicians for the food industry. One of them is the Moscow State University of Food Production. The objectives of the University are to graduate specialists for the processing of raw materials of plant origin.

The University consists of the following main divisions called Institutes: 1. The Institute of Technology and Production Management, which educates engineers in such branches as breadmaking, cake and pasta manufacture, sugar and confectionery technology, beer brewing and wine-making, the technology of fats, oils and cosmetics, baby and functional foods, the technology of public catering foods, food biotechnology and storage, and processing of grain including grain milling, etc.; 2. The Institute of Equipment, Automation and Information Technologies, which trains engineers in the following fields: technological machines and equipment, thermoengineering, packaging technology and design, information technology and computer engineering, automation and control, computer-aided systems for data processing and control and others; 3. The Institute of Economics and Business Management which educates engineers in accounting and auditing, economics and management of food enterprises, marketing, applied information science in economics and so on; 4. The Institute of Management, Quality, Safety and Ecology of Food Enterprises, training specialists in standardization and certification, quality management, environment protection and rational use of natural resources.

Vocabulary:

to graduate – выпускать студентов; выдавать диплом; оканчивать высшее учебное заведение
pasta – макаронные изделия

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