Задание по английскому языку для студентов заочной формы обучения инженерно-педагогического факультета по специальности (Профессиональное обучение – Машиностроение»)
(1 курс 1 семестр)

1. Письменно перевести и тщательно проработать тексты:

Text A. . Properties of metals
Text B Ferrous metals
Text C. Non-ferrous metals.
Text D. Tool.

2. Выполнить все упражнения к текстам.

3. Усвоить грамматический материал:

1 Имя существительное. Множественное число. Существительное в функции определения и его перевод.
2. Имя прилагательное. Степени сравнения. Сравнительные конструкции.
3.Местоимения: личные, притяжательные, вопросительные, указательные, неопределенные, относительные и отрицательные.
4. Словообразование. Наиболее распространенные суффиксы существительных, прилагательных, глаголов и наречий. Приставки. Конверсия.
5. Видо-временные формы глагола:
активный залог – формы Indefinite, Continuous, Perfect (Present, Past, Future).
6. Многозначность глаголов to be, to have, to do.
7. Оборот «There + to be.»

4. Подготовиться к написанию Lexical-Grammar Tests по текстам:

Test 1. The Gasoline Engine.
Test II. The Diesel Engine.

5. Подготовить устное сообщение:

1. Properties of metals (7 – 10 предложений).
2. Ferrous and Non-ferrous metals (7 – 10 предложений).

P.S.

Для самостоятельной работы по изучению английского языка студенты заочной формы обучения могут пользоваться:

1. Андрианова Л.Н. Курс английского языка для вечерних и заочных технических вузов.
2. Электронный словарь Lingvo 12.

Выполненное задание студенты приносят на практическое занятие во время сессии (в январе).

Задание по английскому языку для студентов заочной формы обучения

Задание для студентов заочной формы обучения: ИПФ 1 курс, 1 семестр (машиностроение).

I. Reading materials.

Text A. Properties of Metals

1. Read the text and translate it into Russian in written form.

Metals, group of chemical elements that exhibit all or most of the following physical qualities: they are solid at ordinary temperatures; opaque, except in extremely thin films; good electrical and thermal conductors; lustrous when polished; and have a crystalline structure when in the solid state. Metals and nonmetals are separated in the periodic table by a diagonal line of elements. Elements to the left of this diagonal are metals, and elements to the right are nonmetals. Elements that make up this diagonal—boron, silicon, germanium, arsenic, antimony, tellurium, polonium, and astatine—have both metallic and nonmetallic properties. The common metallic elements include the following: aluminum, barium, beryllium, bismuth, cadmium, calcium, cerium, chromium, cobalt, copper, gold, iridium, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, osmium, palladium, platinum, potassium, radium, rhodium, silver, sodium, tantalum, thallium, thorium, tin, titanium, tungsten, uranium, vanadium, and zinc. Metallic elements can combine with one another and with certain other elements, either as compounds, as solutions, or as intimate mixtures. A substance composed of two or more metals, or a substance composed of a metal and certain nonmetals such as carbon are called alloys. Alloys of mercury with other metallic elements are known as amalgams.

Within the general limits of the definition of a metal, the properties of metals vary widely. Most metals are grayish in color, but bismuth is pinkish, copper is red, and gold is yellow. Some metals display more than one colour, a phenomenon called pleochroism. The melting points of metals range from about -39° C (about -38° F) for mercury to 3410° C (6170° F) for tungsten. Osmium and iridium (specific gravity 22.6) are the densest metals, and lithium (specific gravity 0.53) is the least dense. The majority of metals crystallize in the cubic system, but some crystallize in the hexagonal and tetragonal systems (see Crystal). Bismuth has the lowest electrical conductivity of the metallic elements, and silvers the highest at ordinary temperatures. The conductivity of most metals can be lowered by alloying. All metals expand when heated and contract when cooled, but certain alloys, such as platinum and iridium alloys, have extremely low coefficients of expansion.

II. Language Focus

Exercise 1. Read the following international words and guess their meaning.

Mind the stress.

metal	aluminium	substance
element	cadmium	limit
chemical	Molybdemum	to crystallize
physical	palladium	cubic
temperature	platinum	system
electrical	radium	electrical
diagonal	uranium	extremely

Exercise 2. Memorize the following pairs of derivatives.

V - N	Adj - Adv
to exhibit-exhibition	physical-physically
to separate-separation	ordinary-ordinarily
to compose-composition	electrical-electrically
to combine-combination	common-commonly
to know-knowledge	certain-certainly
to vary –variant	wide-widely
to crystallize-crystallization	dense-densely
to expand-expansion	low-lowly

Exercise 3. Transform as in the models.

Model 1: to exhibit qualities - the exhibition of qualities

To separate metals, to compose a substance, to combine elements, to know properties, to vary definitions, to crystallize the majority of metals, to expand alloys.

Model 2: a physical quality - to qualify physically

An ordinary measurement, an electrical conductor, a common mixture, certain compounds, a wide range, a dense population, a low electrical conductivity.

Exercise 4. Match English and Russian equivalents.

1. Conductivity	a) сероватого оттенка
2. Solid state	b) расширяться при нагревании
3. Metallic properties	c) низкий коэффициент
4. Intimate mixture	d) проводимость
5. Grayish in color	e) температура плавления
6. Melting point	f) свойства металла
7. To expand when heated	g) кубическая система
8. Low coefficient	h) твердое состояние
9. Cubic system	i) общие пределы
10. General limits	g) однородная смесь

Exercise 5. Choose the right word or word-combination.

Pure aluminum is a silvery-white metal with _1_ desirable characteristics. It is light, nontoxic (as the metal), nonmagnetic and nonsparking. It is easily _2_ , machined, and cast. Pure aluminum _3_ and lacks strength, but alloys with small amounts of copper, magnesium, silicon, manganese, and other elements _4_ very useful properties. Aluminum is an abundant element _5_ the earth's crust, but it is not _6_ free in nature. The Bayer process is used to refine aluminum from bauxite, an aluminum ore. Because _7_ aluminum's mechanical and physical properties, it is an extremely convenient and widely used metal

1. a) many	b) much	c) lots
2. a) formatted	b) forming	c) formed
3. a) is soft	b) are soft	c) softly
4. a) has	b) have	c) having
5. a) in	b) at	c) of
6. a) found	b) find	c) finding
7. a)in	b) at	c) of

Exercise 6. Complete the sentences, inserting parts of the sentences given below.

1 .Non-ferrous metals are metals ….
2. There are two groups of metals: ….
3. Ferrous metals contain iron, for example ….
4. Non-ferrous metals don't contain iron, for example ….
5. Nonferrous metals are specified for structural applications ….
6. They are also specified ….

a) aluminium, brass, copper and titanium
b) that do not contain iron.
c) for electrical and electronic applications.
d) requiring reduced weight, higher strength, nonmagnetic properties, etc.
e) carbon steel, stainless steel and wrought iron
f) ferrous and non-ferrous.

Exercise 7. Insert the right word.

(temperature, limits, structure, properties, alloy, colour, elements)

1. Silver has the highest electrical conductivity at ordinary ….
2. Metals have a crystalline ... when in the solid state.
3. The ... of metals vary widely.
4. Pleochroism is a phenomenon when metals display more than one ….
5. Metallic elements can combine with one another and with certain other ….
6. A substance composed of a metal and certain nonmetals is called an ….
7. The properties of metals vary widely within the general ... of the definition of a metal.

II. Comprehension Check and Summarizing

Exercise 8. Answer the questions on the text.

1. What are physical qualities of metals?
2. In which way are metals and nonmetals separated in the periodic table?
3. What metals have both metallic and nonmetallic properties?
4. What do the common metallic elements include?
5. What is an alloy?
6. What are the melting points of metals?
7. What metal has the highest electrical conductivity?

8. Do metals expand when heated?

Exercise 9. Decide which statements are true and which ones are false.

1. All metals are solid at ordinary temperatures; opaque,; good conductors; lustrous when polished; and have a crystalline structure when in the solid state.
2. Metals and nonmetals are separated in the periodic table by a diagonal line.
3. Elements to the left of this diagonal are nonmetals, and elements to the right are metals.
4. Elements that make up this diagonal have nonmetallic properties.
5. Metallic elements can combine with one another and with certain other elements.
6. A substance composed of two or more metals is called an alloy.
7. Most metals are grayish in color, but bismuth is pinkish, copper is black, and gold is yellow.
8. Osmium and iridium are the densest metals.
9. Bismuth has the highest electrical conductivity of the metallic elements, and silvers the lowest at ordinary temperatures.
10. Platinum and iridium alloys have extremely low coefficients of expansion.

Exercise 10. Make a summary of the text.

Text B. Ferrous Metals

1. Read the text and answer the questions below.

As one knows metals can be divided into ferrous and non-ferrous. The former contain iron and the latter do not contain iron. It is to be noted that pure iron is soft, ductile and relatively weak. It is not normally used as an engineering material because of its low strength That is why iron has to be combined with other elements such as carbon, silicon, phosphorus etc The two most important forms of ferrous metals are cast iron and steel, which are both alloys or mixtures of iron and carbon. And carbon is the most important of all elements present in ferrous alloy. Steel and cast iron differ in the quantity of carbon content: iron-carbon alloys with more than approximately 2% by weight of carbon are cast irons.

Cast iron is the cheapest of the ferrous metals. Cast iron is a general term to be applied to iron-carbon alloys containing more than 2.0 per cent of carbon. Cast iron without the addition of alloying elements is weak in tension and shear, strong in compression and has low resistance to impact.

Grey cast iron is an alloy of iron and carbon in which the carbon is present in free or graphite state. Grey cast iron has its term because of special colour of its fracture It is soft, easily machined and only moderately brittle. It is used for the parts not to be subjected to great tensile stresses.

However, many castings that were formerly made of grey cast iron are now made of malleable iron because malleable castings do possess a degree of toughness and this is probably why they have been so named. Malleable iron castings can be made much thinner in section. But they are seldom used in the form they come from the moulds (литейная форма, изложница) as they are hard and brittle and therefore they should be annealed. Malleable iron is the most easily machined of all ferrous alloys.

Malleable iron before annealing is usually spoken of as "white" iron. White iron is difficult to machine because most of the carbon present is in chemical combination with iron. It is desirable to use it in those machines, which require some resistance to abrasion. The tensile strength of white cast iron is about 30.000 psi (pounds per square inch).

1. Is iron used as an engineering material? Why?
2. What are the most important forms of ferrous metals?
3. Which is the cheapest of the ferrous metals?
4. What are the properties of cast iron without the addition of alloying elements?
5. Is grey cast iron brittle?
6. Malleable castings possess a degree of toughness, don't they?
7. What is "white" iron?
8. What iron is the most easily machined of all ferrous alloys?

Text C. Non-ferrous Metals

1. Read the text and describe major operations one can do on a lathe.

Non-ferrous are metals and alloys the main component of which is not iron but some other elements such as aluminum, copper and others. Some of the characteristics of non-ferrous metals are high electric and heat conductivity, high corrosion resistance, light weight and ease of fabrication.

We know aluminum to be one of the best-known light metals. Aluminum was first produced in the laboratory in 1825 by reducing aluminum chloride. However, wide acceptance of aluminum as an engineering material did not occur until World War II. Since then usage of aluminum has steadily increased each year. Aluminum is said to be a white silvery metal, which does not rust in the air. Its good corrosion resistance and

low density permit it to be widely used in the field of transportation. It is to be noted that aluminum is highly ductile and can be shaped easily by a wide variety of methods and can be rolled. The tensile strength of aluminum is low in comparison with that of iron. The good electrical conductivity of the metal makes it suitable for many applications in the electrical industry. Everybody knows aluminum to be used extensively for castings that must be light in weight, light in colour or that must not rust. To make aluminum harder it is necessary to add some other metals to it. Copper, zinc and iron are the metals that alloy freely with aluminum.

Historically, copper became one of the first engineering metals. It is known to have been used in prehistoric times for making weapons and tools. Later it was alloyed with tin to form bronze. Having very high electric conductivity and high corrosion-resistant qualities, pure copper is *a* good conductor. However, copper alloys are stated to be more widely employed, chief among them are brasses and bronzes. Brasses are alloys of copper and zinc in different proportions.

Bronze is an alloy containing primarily copper and tin, but other elements can be added to the alloy to improve its properties such as hardness and resistance to wear. Additions of some other elements to copper alloys permit certain properties to be made better.

2. Render the text in Russian.

Text D. Tool

1. Read the text and describe the main kinds of tools.

Tool is an instrument for making material changes on other objects, as by cutting, shearing, striking, rubbing, grinding, squeezing, measuring, or other process. A hand tool is a small manual instrument traditionally operated by the muscular strength of the user; a machine tool is a power-driven mechanism used to cut, shape, or form materials such as wood and metal. Tools are the primary means by which human beings control and manipulate their physical environment.

Dating back to approximately 2,600,000 years ago, the beginning of the Paleolithic Age, the earliest known tools consisted of variously sized examples of the pebble tool, or chopper. The chopper is thought to be the first tool made and used by human beings. The chopper typically consisted of a water-worn, fist-sized rock, which had been chipped away at one end to create a roughly serrated-edge. It was used for Paleolithic man's most urgent necessity, cutting through the skin and sinews of the animals he hunted. The chopper was the only tool used by humanity for almost 2,000,000 years, until the appearance of the hand axe, a superior version of the chopper. In this tool the entire surface of the rock was worked. Because both faces were chipped, the edge of the hand axe was considerably sharper than that of the earlier chopper.

Modern hand tools were developed in the period after 1500 BC. They are now generally considered in the following classes: percussive tools, which deliver blows (the axe, adz and hammer); cutting, drilling, and abrading tools (the knife, awl, drill, saw, file, chisel and plane); the screw-based tools (screwdrivers and wrenches); measuring tools (ruler, plumb line, level, square, compass, and chalk line); and accessory tools (the workbench, vise, tongs and pliers).

With the invention of the steam engine in the 18th century, mankind discovered how to drive tools mechanically. In particular, machine-driven tools became necessary to manufacture the parts for the machines that now made goods formerly produced by hand. Most common machine tools were designed by the middle of the 19th century. Today, scores of different machine tools are used in the workshops of home and industry. These are frequently classified into seven types: turning machines; shapers and planers, power drills; milling machines; grinding machines; power saws; and presses.

The most fundamental of all seven is the horizontal metal-turning machine called the lathe, which is employed in a vast number of turning, facing, and drilling operations.

Shapers and planers use single-point tools to machine flat surfaces. Shapers move the cutting tool back and forth over the material, peeling away the surface, whereas planers have stationary tools, and the surface is moved to encounter them. Power drills are usually known as drill presses and have a twist drill that cuts holes in metal and other substances. They can also be used for many of the countersinking, boring, tapping, and other purposes for which lathes are frequently used.

II. Grammar

1. Подготовиться к лексико-грамматическому тесту по текстам:

«The Gasoline Engine», «The diesel engine»

2. Повторить грамматический материал к лексико-грамматическому тесту:

4

2.1. Имя существительное. Мн. Число. Существительное в функции определения и его перевод. Суффиксы производных существительных.
2.2. Имя прилагательное. Степени сравнения. Сравнительные конструкции. Суффиксы производных прилагательных.
2.3. Местоимения: личные, притяжательные, вопросительные, указательные, неопределённые, относительные и отрицательные.
2.4. Видо-временные формы глагола:
- Активный залог – формы Indefinite (Present, Past, Future).
Continuous (Present, Past, Future).
Perfect (Present, Past, Future).
2.5. Спряжение глаголов to be, to have; и их функции.
2.6. Оборот There + to be.

III. Tests.

Text 1. The Gasoline Engine

If the fuel (gas, oil) burns inside an engine cylinder, it is then called an internal combustion engine. A gasoline engine is the perfect example. There are two types of gasoline engines - the two-cycle and four-cycle engines. Both types have pistons that move up and down in cylinders.

One cycle (or stroke) is one up movement or one down movement of a piston. In a two-cycle engine, each piston goes down once and up once every time the spark plugs ignite the fuel. Two-cycle engines are used where the machine needs to be light in weight. A power lawn mower usually has a two-cycle engine. So does a model airplane engine. Speed and efficiency are not too important.

Most larger gasoline engines, such as those in automobiles, are four-cycle. In these four-cycle engines, each piston goes down twice and up twice while the fuel is ignited once. A starter mechanism sets the pistons in motion. Once started, explosions resulting from the spark plugs igniting the fuel help keep the pistons moving. Each piston is connected by a rod to a crankshaft which transfers the power to the wheels of the machine.

Every piston goes down twice and up twice (four cycles) to every explosion. The strokes are called intake, compression, power, and exhaust. As the drawing show, one down stroke draws in fuel (intake); one up stroke compresses or squeezes the fuel into the top of the cylinder where it is ignited by the spark plug (compression); a second down stroke uses the power of the explosion to turn the crankshaft (power); a second up stroke drives the burned gases out the exhaust valve (exhaust). This operation is, of course, repeated over and over in every cylinder. The four strokes in one cylinder are completed in a fraction of a second.

There are usually six or more pistons in a four-cycle engine. To get the most power the explosions are timed to go off at different times in each cylinder.

Text 2. The Diesel Engine

The diesel engine is also an internal combustion engine. It works on the same cylinder and pistons principal as a gasoline engine. There are, however, two main differences between the diesel and gasoline engine. A diesel engine uses a special grade of fuel oil - not gasoline. Hot compressed air - not the spark from a spark plug - ignites this fuel oil.

There are two-cycle and four-cycle diesel engines. Let's look at the operation of the one cylinder in a four-cycle diesel engine:

A starter gets the piston moving. As the piston moves downward, it draws air into the cylinder through an air valve. (In some engines, air is forced in by a blower called a supercharger.) That completes one cycle (or stroke). The piston then moves up compressing or squeezing the air into the top of the cylinder. As the air is squeezed, its temperature is increased to about 900° F. this completes the second cycle. Next the oil intake valve opens and oil is sprayed into the cylinder. The heat from the air (like the spark in a gasoline engine) ignites the oil. The resulting explosion forces the piston dawn ward. This third cycle is the power stroke; it turns the engine drive shaft. Finally, as in a burned engine, the piston conies back up and forces the burned or exhaust gases out of the cylinder through an escape valve. This all takes only seconds and occurs in all the cylinders at timed intervals.

A diesel engine gets more energy out of its fuel than any other type internal combustion engine. It is more efficient than a steam engine. The fuel is cheaper, too, requiring less refining than gasoline. Much progress has been made in the design of diesel engines in recent years so more and more of them are in use today. This is especially true among automobiles and light trucks.