

Приложение ППССЗ по специальности 11.02.16 Монтаж, техническое обслуживание и ремонт электронных приборов и устройств 2024-2025 уч.г.: Комплект контрольно-оценочных средств учебной дисциплины ОГСЭ.03 Иностранный язык в профессиональной деятельности

**МИНИСТЕРСТВО ОБРАЗОВАНИЯ БЕЛГОРОДСКОЙ ОБЛАСТИ
ОБЛАСТНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ПРОФЕССИОНАЛЬНОЕ
ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ
«АЛЕКСЕЕВСКИЙ КОЛЛЕДЖ»**

**Комплект
контрольно-оценочных средств**

по учебной дисциплине

**ОГСЭ.03 Иностранный язык в профессиональной
деятельности**

для специальности

**11.02.16 Монтаж, техническое обслуживание и ремонт
электронных приборов и устройств**

Алексеевка – 2024

Комплект контрольно-оценочных средств разработан на основе Федерального государственного образовательного стандарта среднего профессионального образования по специальности 11.02.16 Монтаж, техническое обслуживание и ремонт электронных приборов и устройств, утвержденного приказом Министерства просвещения Российской Федерации № 691 от 04 октября 2021 года, с учетом профессионального стандарта «Сборщик электронных устройств», утвержденного приказом Министерства труда и социальной защиты Российской Федерации от 14 июля 2020 года № 421н и профессионального стандарта «Регулировщик и настройщик радиоэлектронных средств», утвержденного приказом Министерства труда и социальной защиты Российской Федерации от 22 ноября 2023 г. N 832н

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1. Паспорт комплекта оценочных средств

1.1 Область применения комплекта оценочных средств

Контрольно-оценочные средства (КОС) предназначены для контроля и оценки образовательных достижений обучающихся, освоивших программу учебной дисциплины ОГСЭ.03 Иностранный язык в профессиональной деятельности. КОС включают контрольные материалы для проведения текущей и промежуточной аттестации в форме дифференцированного зачета.

КОС разработан на основании рабочей программы учебной дисциплины ОГСЭ.03 Иностранный язык в профессиональной деятельности.

1.2. Цели и задачи учебной дисциплины – требования к результатам освоения учебной дисциплины:

Умения	Знания
<ul style="list-style-type: none">– понимать общий смысл воспроизведённых высказываний в пределах литературной нормы на бытовые и профессиональные темы;– понимать содержание текста, как на базовые, так и на профессиональные темы;– осуществлять высказывания (устно и письменно) на иностранном языке на профессиональные и повседневные темы;– осуществлять переводы (со словарем и без словаря) иностранных текстов профессиональной направленности;– строить простые высказывания о себе и своей профессии деятельности;– производить краткое обоснование и объяснение своих текущих и планируемых действий;– выполнять письменные простые связные сообщения на интересующие профессиональные темы;- разрабатывать планы к самостоятельным работам для подготовки проектов и устных сообщений.	<ul style="list-style-type: none">– особенности произношения интернациональных слов и правила чтения технической терминологии и лексики профессиональной направленности;– основные общеупотребительные глаголы бытовой и профессиональной лексики;– лексический (1000 - 1200 лексических единиц) минимум, относящийся к описанию предметов, средств и процессов профессиональной деятельности;– основные грамматические правила, необходимые для построения простых и сложных предложений на профессиональные темы.

Профессиональные (ПК) и общие (ОК) компетенции, которые актуализируются при изучении учебной дисциплины:

ОК 1. Выбирать способы решения задач профессиональной деятельности применительно к различным контекстам.

ОК 2. Использовать современные средства поиска, анализа и интерпретации информации и информационные технологии для выполнения задач профессиональной деятельности

ОК 3. Планировать и реализовывать собственное профессиональное и личностное развитие, предпринимательскую деятельность в профессиональной сфере, использовать знания по финансовой грамотности в различных жизненных ситуациях

ОК 4. Эффективно взаимодействовать и работать в коллективе и команде

ОК 5. Осуществлять устную и письменную коммуникацию на государственном языке Российской Федерации с учетом особенностей социального и культурного контекста

ОК 6. Проявлять гражданско-патриотическую позицию, демонстрировать осознанное поведение на основе традиционных общечеловеческих ценностей, в том числе с учетом гармонизации межнациональных и межрелигиозных отношений, применять стандарты антикоррупционного поведения

ОК 7. Содействовать сохранению окружающей среды, ресурсосбережению, применять знания об изменении климата, принципы бережливого производства, эффективно действовать в чрезвычайных ситуациях

ОК 8. Использовать средства физической культуры для сохранения и укрепления здоровья в процессе профессиональной деятельности и поддержания необходимого уровня физической подготовленности.

ОК 9. Пользоваться профессиональной документацией на государственном и иностранном языках.

ПК 1.1 Осуществлять сборку, монтаж и демонтаж электронных приборов и устройств в соответствии с требованиями технической документации

ПК 1.2 Осуществлять сборку, монтаж и демонтаж электронных приборов и устройств и их настройку и регулировку в соответствии с требованиями технической документации и с учетом требований технических условий

ПК 2.3 Выполнять техническое обслуживание электронных приборов и устройств в соответствии с регламентом и правилами эксплуатации

ПК 3.2 Разрабатывать проектно-конструкторскую документацию печатных узлов электронных приборов и устройств и микросборок средней сложности

1.4. Планируемые личностные результаты освоения рабочей программы

ЛР 1. Осознающий себя гражданином и защитником великой страны

ЛР 4. Проявляющий и демонстрирующий уважение к людям труда, осознающий ценность собственного труда. Стремящийся к формированию в

сетевой среде лично и профессионального конструктивного «цифрового следа»

ЛР 7. Осознающий приоритетную ценность личности человека; уважающий собственную и чужую уникальность в различных ситуациях, во всех формах и видах деятельности.

ЛР 8. Проявляющий и демонстрирующий уважение к представителям различных этнокультурных, социальных, профессиональных и иных групп. Сопричастный к сохранению, преумножению и трансляции культурных традиций и ценностей многонационального российского государства.

ЛР 10. Заботящийся о защите окружающей среды, собственной и чужой безопасности, в том числе цифровой.

ЛР 11. Проявляющий уважение к эстетическим ценностям, обладающий основами эстетической культуры

1.3 Результаты освоения учебного предмета, подлежащие проверке

Наименование тем	Коды личностных результатов (ЛР) и профессиональных (ПК) и общих компетенций (ОК), Формированию которых способствует элемент программы	Средства контроля и оценки результатов обучения в рамках текущей аттестации (номер задания)	Средства контроля и оценки результатов обучения в рамках промежуточной аттестации (номер задания/контрольного вопроса/ экзаменационного билета)
Раздел 1. Теоретические основы перевода технической документации	<i>ЛР1, ЛР7, ЛР8, ОК 01, ОК 02, ОК 05, ОК 09, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №1 Текст №2 Текст №3	Практическое задание №1
Раздел 2. Научно-технический прогресс	<i>ЛР1, ЛР4, ЛР8, ЛР10, ОК 01, ОК 02, ОК 03, ОК 06, ОК 09 ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №4 Текст №5	Практическое задание №2
Раздел 3 Математические действия, операции	<i>ЛР4, ЛР10, ОК 01, ОК 02, ОК 03, ОК 06, ОК 07, ОК 09 ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №6 Текст №7	Практическое задание №3
Раздел 4 Электроника и источники питания	<i>ЛР4, ЛР7, ЛР8, ЛР10 ОК 1, ОК 02, ОК 07, ОК 08, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №8 Текст №9	Практическое задание №4
Раздел 5. Элементы и узлы электронной аппаратуры	<i>ЛР4, ЛР7, ЛР8, ЛР10 ОК 1, ОК 02, ОК 07, ОК 08, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №10 Текст №11	Практическое задание №5
Раздел 6. Монтаж и ремонт электронной техники	<i>ЛР4, ЛР7, ЛР10, ОК 01, ОК 02, ОК 04, ОК 06, ОК 07, ОК 08, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №12 Текст №13	Практическое задание №6
Раздел 7. Настройка, регулировка и тестирование электронных приборов и устройств	<i>ЛР4, ЛР7, ЛР10, ОК 01, ОК 02, ОК 04, ОК 06, ОК 07, ОК 08, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №14 Текст №15	Практическое задание №7
Раздел 8. Мировые достижения науки и техники и тенденции в области электроники	<i>ЛР4, ЛР7, ЛР10, ОК 01, ОК 02, ОК 04, ОК 06, ОК 07, ОК 08, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №16	Практическое задание №8
Раздел 9. Перспективы развития электроники	<i>ЛР4, ЛР7, ЛР10, ОК 01, ОК 02, ОК 04, ОК 06, ОК 07, ОК 08, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №17	Практическое задание №9
Раздел 10. Профессии, связанные с эксплуатацией электронного оборудования	<i>ЛР1, ЛР4, ЛР7, ОК 01, ОК 02, ОК 03, ОК 04, ОК 06, ОК 09, ПК 1.1, ПК 1.2, ПК 2.3, ПК 3.2</i>	Текст №18	Практическое задание №10

2. Комплект оценочных средств для текущей аттестации

2.1. Текстовые задания

- прочтите текст
- сделайте перевод текста
- выполните задания к тексту.

Текст №1

THE NATURE OF ELECTRICITY

Practical electricity is produced by small atomic particles known as electrons. It is the movement of these particles which produce the effects of heat and light.

The pressure that forces these atomic particles to move, the effects they encounter opposition and how these forces are controlled are some of the principles of electricity.

Accepted atomic theory states that all matter is electrical in structure. Any object is largely composed of a combination of positive and negative particles of electricity. Electric current will pass through a wire, a body, or along a stream of water. It can be established in some substances more readily than in others, that all matter is composed of electric particles despite some basic differences in materials. The science of electricity then must begin with a study of the structure of matter. Matter is defined as any substance which has mass (or weight) and occupies space. This definition should be broad enough to cover all physical objects in the universe. Wood, water, iron, and paper are some examples of matter. Energy is closely related to, but not to be confused with, matter. Energy does not have mass, and it does not occupy space. Heat and light are examples of energy.

The smallest particle of matter which can be recognized as an original substance was thought to be a unit called the atom. Recently scientists have found particles even smaller than atoms, but our theories are still based on the atom. The atom consists of a nucleus and a cloud of electrons. It is generally agreed that the electrons are small particles of electricity, which are negative in nature. These particles orbit the nucleus in much the same fashion that planets orbit a sun.

II. Guess the meaning of the following international words:

Electricity, electron, effect, structure, combination, material, mass, energy, atom, orbit

III. Give the English equivalents for the words below:

1) производить; 2) частица; 3) тепло и свет; 4) напряжение; 5) сила; 6) вещество; 7) положительный; 8) отрицательный; 9) электрический ток; 10) вес; 11) ядро

IV. Translate into Russian the words and expressions from the text:

1) atomic particle; 2) effects of heat and light; 3) encounter opposition; 4) principles of electricity; 5) composed (of); 6) pass through a wire; 7) structure of matter; 8) occupy space; 9) physical objects; 10) a cloud of electrons; 11) in the same fashion.

V. Complete the sentences using the text:

1. Electricity is produced by ...
2. The effects of heat and light are produced by ...
3. According to the accepted atomic theory all matter is ...

4. Any object is composed of ...
5. Matter is defined as ...
6. Energy must not be confused with ...
7. The atom consists of ...
8. The smallest particle of matter is ...
9. Most theories are based on ...
10. Electrons are ...

VI. Answer the questions:

1) What are the principles of electricity? 2) What must the science of electricity begin with? 3) Are there any differences between energy and matter? What are they? 4) What is recognized as an original substance now?

VII. Topics for discussion:

1. The nature of electricity;
2. The nature of matter;
3. Contents of atomic theory.

Текст №2

ELECTRIC CURRENT

The electric current is a quantity of electrons flowing in a circuit per second of time. The unit of measure for current is ampere. If one coulomb passes a point in a circuit per second then the current strength is 1 ampere. The symbol for current is I.

The current which flows along wires consists of moving electrons. The electrons move along the circuit because the e .m. f. drives them. The current is directly proportional to the e. m. f.

In addition to traveling through solids, however, the electric current can flow through liquids as well and even through gases. In both cases it produces some most important effects to meet industrial requirements. Some liquids, such as melted metals for example, conduct current without any change to themselves. Others, called electrolytes, are found to change greatly when the current passes through them.

When the electrons flow in one direction only, the current is known to be d. c., that is, direct current. The simplest source of power for the direct current is a battery, for a battery pushes the electrons in the same direction all the time (i.e., from the negatively charged terminal to the positively charged terminal).

The letters a. c. stand for alternating current. The current under consideration flows first in one direction and then in the opposite one. The a. c. used for power and lighting purposes is assumed to go through 50 cycles in one second.

One of the great advantages of a. c. is the ease with which power at low voltage can be changed into an almost similar amount of power at high voltage and vice versa. Hence, on the one hand alternating voltage is increased when it is necessary for long-distance transmission and, on the other hand, one can decrease it to meet industrial requirements as well as to operate various devices at home.

Although there are numerous cases when d. c. is required, at least 90 per cent of electrical energy to be generated at present is a. c. In fact, it finds wide application for lighting, heating, industrial, and some other purposes.

II. Guess the meaning of the following international words:

electric, ampere, symbol, proportional, industrial, metal, electrolyte, battery, generate.

III. Give the English equivalents for the words and word combinations below:

a. 1) течь, протекать; 2) цепь, схема; 3) единица измерения; 4) провод; 5) электродвижущая сила; 6) твердое тело; 7) жидкость; 8) проводить (ток); 9) источник энергии; 10) постоянный ток; 11) переменный ток; 12) напряжение.

IV. Give Russian equivalents for the following:

b. 1) to meet industrial requirements; 2) melted metals; 3) to push in the same direction; 4) negatively (positively) charged terminal; 5) power and lightning purposes; 6) long-distance transmission; 7) to operate devices; 8) to find wide application.

V. Say whether these sentences are true or false:

1. The symbol for current is I.
2. The electric current can flow only through liquids.
3. The current can be of two types: direct current and alternating current.
4. The alternating current flows in one direction.
5. A battery is the simplest source of power for the direct current.
6. Direct current finds wider application than alternating current.
7. Electrolytes don't change greatly when current passes through them.
8. One of the great advantages of alternating current is the ease with which voltage can be changed.

VI. Fill in the blanks, using the words from the box:

direct current, solids, conduct, electric current, liquids, voltage, alternating current

- ✓ A quantity of moving electrons flowing in a circuit is the a) _____ .
- ✓ The current can flow through b) _____ and c) _____ .
- ✓ Some liquids d) _____ current without any change to themselves.
- ✓ When the electrons flow in one direction only, the current is known to be e) _____ .
- ✓ The current flowing first in one direction and then in the opposite one is f) _____ .
- ✓ Such advantage of alternating current as alternating g) _____ finds wide industrial and household application.

VII. State the questions to the underlined words:

1. *Melted metals* conduct current without any change to themselves.
2. Alternating voltage can be changed *to operate various devices at home*.
3. A battery pushes the *electrons* in the same direction.
4. *The alternating current* is used for power and lightning purposes.
5. Alternating current accounts for *90 per cent* of electrical energy generated now.

VIII. Say some sentences about the types of electric current and its properties

Текст №3

EFFECTS PRODUCED BY A CURRENT

The current flow is detected and measured by any of the effects that it produces. There are three important effects accompanying the motion of electric charges: the heating, the magnetic, and chemical effects, the latter is manifested under special conditions.

The production of heat is perhaps the most familiar among the principal effects of an electric current. The heating effect of the current is found to occur in the electric circuit itself. It is detected owing to an increase in the temperature of the circuit. This effect represents a continual

transformation of electric energy into heat. For instance, the current which flows through the filament of an incandescent lamp heats that filament to a high temperature.

The heat produced per second depends both upon the resistance of the conductor and upon the amount of current carried through it. The thinner the wire is, the greater the developed heat is. On the contrary, the larger the wire is, the more negligible the heat produced is. Heat is greatly desirable at times but at other times it represents a waste of useful energy. It is this waste that is generally called "heat loss" for it serves no useful purposes and decreases efficiency.

The heat developed in the electric circuit is of great practical importance for heating, lighting and other purposes. Owing to it people are provided with a large number of appliances, such as: electric lamps that light our homes, streets and factories, electrical heaters that are widely used to meet industrial requirements, and a hundred and one other necessary and irreplaceable things which have been serving mankind for so many years.

The electric current can manifest itself in some other way. It is the motion of the electric charges that produces the magnetic forces. A conductor of any kind carrying an electric current, a magnetic field is set up about that conductor.

This effect exists always whenever an electric current flows, although in many cases it is so weak that one neglects it in dealing with the circuit. An electric charge at rest does not manifest any magnetic effect. The use of such a machine as the electric motor has become possible owing to the electromagnetic effect.

The last effect to be considered is the chemical one. The chemical effect is known to occur when an electric current flows through a liquid. Thanks to it a metal can be transferred from one part of the liquid to another. It may also effect chemical changes in the part of the circuit comprising the liquid and the two electrodes which are found in this liquid. Any of the above mentioned effects may be used for detecting and measuring current.

II. Give the English equivalents for the following words:

- | | |
|----------------------------|----------------------------------|
| 1. выявлять, обнаруживать; | 6. лампа накаливания; |
| 2. измерять; | 7. прибор; |
| 3. заряд; | 8. потеря энергии; |
| 4. нить накала; | 9. освещать; |
| 5. тепловой эффект; | 10. обнаруживаться, проявляться. |

III. Guess the meaning of the following international words:

transformation, temperature, chemical, magnetic, special, practical, motor, electrode.

IV. Insert words and expressions:

1. The current flow is (выявляется и измеряется) by any of the effects that it produces.
2. There are three important effects accompanying the motion of (электрические заряды).
3. The current which flows through the (нить накала лампы накаливания) heats that filament to a high temperature.
4. Heat represents (потерю полезной энергии) at times.
5. Electric lamps (освещать) our homes, streets and factories.
6. The electric current can (проявлять) magnetic effect.

V. Choose the correct translation:

The heating effect of the current is found to occur in the electric circuit itself.

1. Установлено, что тепловой эффект электрического тока обнаруживается в самой электрической цепи.
2. Тепловой эффект электрического тока может появляться в самой электрической цепи.

3. Установлено, что тепловой эффект электрического тока должен обнаруживаться в самой электрической цепи.

Когда в любом проводнике появляется электрический ток, вокруг него возникает магнитное поле.

1. A conductor of any kind carrying an electric current, a magnetic field was set up about that conductor.
2. A conductor of any kind have been carrying an electric current, a magnetic field is set up about that conductor.
3. A conductor of any kind carrying an electric current, a magnetic field is set up about that conductor.

Последний эффект, который необходимо рассмотреть – химический эффект.

1. The last effect is considered to be the chemical one.
2. The last effect to be considered is the chemical one.
3. The last effect would be considered the chemical one.

Известно, что химический эффект возникает, когда электрический ток проходит через жидкость.

1. The chemical effect is known to occur when an electric current flows through a liquid.
2. The chemical effect is famous to occur when an electric current flows through a liquid.
3. The chemical effect may be known to occur when an electric current flows through a liquid.

Именно движение электрических зарядов порождает магнитные силы.

1. The motion of the electric charges produces the magnetic forces.
2. It is the motion of the electric charges that produces the magnetic forces.
3. The motion of the electric charges is certain to produce the magnetic forces.

VI. Answer the questions:

1. What effects does the current flow produce?
2. How is the heating effect detected?
3. What does the heat produced depend upon?
4. What is called “heat loss”?
5. How is the magnetic effect set up?
6. What is the main condition of the magnetic effect existence?
7. When does the chemical effect occur?

VII. Speak about the principal effects of an electric current, using the text and chart above

Текст №4

I. Read the text

ELECTRIC CIRCUITS

The concepts of electric charge and potential are very important in the study of electric currents. When an extended conductor has different potentials at its ends, the free electrons of the conductor itself are caused to drift from one end to the other. The potential difference must be maintained by some electric source such as electrostatic generator or a battery or a direct current generator. The wire and the electric source together form an electric circuit, the electrons are drifting around it as long as the conducting path is maintained.

There are various kinds of electric circuits such as: open circuits, closed circuits, series circuits, parallel circuits and short circuits. To understand the difference between the following circuit connections is not difficult at all. If the circuit is broken or «opened» anywhere, the current is known to stop everywhere. The circuit is broken when an electric device is switched off. The path along which the electrons travel must be complete otherwise no electric power can be supplied from the source to the load. Thus the circuit is “closed” when an electric device is switched on.

When electrical devices are connected so that the current flows from one device to another, they are said «to be connected in series». Under such conditions the current flow is the same in all parts of the circuit as there is only a single path along which it may flow. The electrical bell circuit is considered to be a typical example of a series circuit. The “parallel” circuit provides two or more paths for the passage of current. The circuit is divided in such a way that part of the current flows through one path and part through another. The lamps in the houses are generally connected in parallel.

The “short” circuit is produced when the current can return to the source of supply without control. The short circuits often result from cable fault or wire fault. Under certain conditions the short circuit may cause fire because the current flows where it was not supposed to flow. If the current flow is too great a fuse is used as a safety device to stop the current flow.

II. Guess the meaning of the following international words:

concept, potential, electrostatic generator, aluminum, parallel, typical, control.

III. Give the English equivalents for the following words and word combinations:

1) электрические цепи, 2) электрический заряд, 3) проводник, 4) сопротивление, 5) движение электронов, 6) изолятор, 7) короткое замыкание, 8) энергия.

IV. Say whether these sentences are true or false:

1. When an extended conductor has the same potential at its ends, free electrons are drifting from one end to another.
2. The wire and the electric source together form an electric circuit.
3. A path of any material will allow current to exist.
4. Silver, copper and gold oppose very strongly.
5. The slighter the opposition is, the better the insulator is.
6. There is only one type of electric circuit.
7. We close the circuit when we switch on our electric device.

V. Complete the sentences using the text:

1. The potential difference must be maintained by ...
2. Materials that offer slight opposition are called ...
3. The best insulators are ...
4. There are various kinds of electric circuits such as ...
5. We “open” the circuit when ...
6. We “close” the circuit when ...
7. The “short” circuit is produced when ...
8. A fuse is ...

VI. Answer the questions:

1. What concepts are very important in study of electric current?
2. What forms an electric circuit?
3. What materials are the best conductors and insulators?

4. What kinds of electric circuits do you know?
5. How can we open and close the circuit?
6. When are electrical devices connected in series?
7. What is an example of a series circuit?
8. What can you say about «parallel» circuits?
9. What does the short circuit often result from?

VII. Talk on the types of electric circuits

Текст №5

I. Read the text

ALTERNATING CURRENT

Current is defined as increment of electrons. The unit for measuring current was named in honor of A.M. Ampere, the French physicist. Thus it is called ampere. The symbol for current is I. The electric current is a quantity of electrons flowing in a circuit per second of time. The electrons move along the circuit because the e. m. f. drives them. The current is directly proportional to the e. m. f.

A stream of electrons in a circuit will develop a magnetic field around the conductor along which the electrons are moving. The strength of the magnetic field depends upon the current strength along the conductor. The direction of the field is dependent upon the direction of the current.

If the force causing the electron flow is indirect, the current is called direct (d. c.). If the force changes its direction periodically the current is called alternative (a. c.).

Alternating current is the current that changes direction periodically. The electrons leave one terminal of the power supply, flow out along the conductor, stop, and then flow back toward the same terminal. A voltage that caused current reverses its polarity periodically. This is properly called an alternating voltage. The power supply that provides the alternating voltage actually reverses the polarity of its terminals according to a fixed periodic pattern. A given terminal will be negative for a specific period of time and drive electrons out through the circuit. Then, the same terminal becomes positive and attracts electrons back from the circuit. This voltage source cannot be a battery. It must consist of some types of rotating machinery.

II. Guess the meaning of the following international words:

- 1) physicist, 2) ampere, 3) symbol, 4) second, 5) polarity, 6) period, 7) battery.

III. Translate into Russian the words and expression from the text:

- 1) increment of electrons; 2) measuring; 3) to drive; 4) directly proportional; 5) conductor; 6) strength; 7) causing force; 8) terminal; 9) to flow; 10) to reverse.

IV. Give the English equivalents for the words below:

- 1) переменный ток, 2) за секунду, 3) количество электронов, 4) поток электронов, 5) магнитное поле, 6) направление, 7) зависеть, 8) усиление, 9) источник напряжения, 10) ротационный механизм.

V. Complete the sentences using the text:

1. The electric current is ...
2. The unit for measuring current is ...
3. A stream of electrons in a circuit will develop ...

4. The current is called direct if ...
5. The current is called alternating if...
6. Alternating voltage is ...
7. Alternating voltage source cannot be ...

VI. Answer the questions:

1. Why do electrons move along the circuit?
2. What does the strength of the magnetic field depend upon?
3. What does the direction of the field depend upon?
4. What is the way of alternating current electrons?
5. How does the alternating voltage power supply reverse the polarity of terminals?

VI. Talk on the properties of the electric current and its types

Текст №6

I. Read the text

CONDUCTORS AND INSULATORS

All substances have some ability of conducting the electric current, however, they differ greatly in the ease with which the current can pass through them. Solid metals conduct electricity with ease while non-metals do not allow it to flow freely. Thus, there are conductors and insulators. What do the terms "conductors" and "insulators" mean? This difference is expressed by what is called electrical conductivity of the body. It depends upon the atomic constitution of the body. Substances through which electricity is easily transmitted are called conductors. Any material that strongly resists the electric current flow is known as an insulator.

Conductance, that is the conductor's ability of passing electric charges, depends on the four factors: the size of the wire used, its length and temperature as well as the kind of material to be employed. A large conductor will carry the current more readily than a thinner one. To flow through a short conductor is certainly easier for the current than through a long one in spite of their being made of similar material. Hence, the longer the wire, the greater is its opposition, that is resistance, to the passage of current.

There is a great difference in the conducting ability of various substances. Almost all metals are good electric current conductors. The best conductors are silver, copper, gold and aluminum. Nevertheless, copper carries the current more freely than iron; and silver, in its turn, is a better conductor than copper. Copper is the most widely used conductor. The electrically operated devices are connected to the wall socket by copper wires.

A material which resists the flow of the electric current is called an insulator. The higher the opposition is, the better the insulator is. There are many kinds of insulation used to cover the wires. The kind used depends upon the purposes the wire or cord is meant for. The insulating materials generally used to cover the wires are rubber, asbestos, glass, plastics and others. The best insulators are oil, rubber and glass. Rubber covered with cotton, or rubber alone is the insulating material usually used to cover desk lamp cords and radio cords. Glass is the insulator to be often seen on the poles that carry the telephone wires in city streets. Glass insulator strings are usually suspended from the towers of high voltage transmission lines. One of the most important insulators of all, however, is air. That is why power transmission line wires are bare wires depending on air to keep the current from leaking off.

Conducting materials are by no means the only materials to play an important part in electrical engineering. There must certainly be a conductor, that is a path, along which electricity is to travel and there must be insulators keeping it from leaking off the conductor.

II. Give the Russian equivalents for the words and word combinations below:

1) conductors; 2) insulators; 3) transmit; 4) resistance; 5) passage of current; 6) socket; 7) to connect to; 8) cord; 9) high voltage transmission line; 10) leak off.

III. Find in the text the sentences with the following related words and translate them:

conducting – conductor – conductivity – conductance

IV. State questions to the underlined words:

- 1) *Solid metals* conduct electricity with ease.
- 2) Conductance depends on the *four factors*.
- 3) There are *many kinds of insulation* used to cover the wires.
- 4) *Insulators* keep electricity from leaking off the conductor.
- 5) *Conductors* play an important role in electrical engineering.

V. Say whether these sentences are true or false:

- 1) Electrical conductivity of a body depends upon its atomic constitution.
- 2) There is no difference in the conducting ability of various substances.
- 3) The longer the wire is the weaker its opposition is.
- 4) The kind of the insulating material depends upon the purpose it is meant for.
- 5) Conductors are substances through which electricity is easily transmitted.
- 6) Insulators do not allow the electric current to flow freely.

VI. Talk on the conducting ability of various substances and their appliance in electrical engineering.

Текст №7

I. Read the text

SEMICONDUCTORS

There are materials that really occupy a place between the conductors of the electric current and the non-conductors. They are called semiconductors. These materials conduct electricity less readily than conductors but much better than insulators.

Semiconductors include almost all minerals, many chemical elements, a great variety of chemical compounds, alloys of metals, and a number of organic compounds. Like metals, they conduct electricity but they do it less effectively.

In metals all electrons are free and in insulators they are fixed. In semiconductors electrons are fixed, too, but the connection is so weak that the heat motion of the atoms of a body easily pulls them away and sets them free.

Minerals and crystals appear to possess some unexpected properties. It is well known that their conductivity increases with heating and falls with cooling.

As a semiconductor is heated, free electrons in it increase in number, hence, its conductivity increases as well.

Heat is by no means the only phenomenon influencing semiconductors. They are sensitive to light, too. Take germanium as an example. Its electrical properties may greatly change when it is exposed to light. With the help of a ray of light directed at a semiconductor, we can start or stop various machines, effect remote control, and perform lots of other useful things. Just as they are influenced by falling light, semiconductors are also influenced by all radiation.

Generally speaking, they are so sensitive that a heated object can be detected by its radiation.

Such dependence of conductivity on heat and light has opened up great possibilities for various uses of semiconductors. The semiconductor devices are applied for transmission of signals, for automatic control of a variety of processes, for switching on engines, for the reproduction of sound, protection of high-voltage transmission lines, speeding up of some chemical reactions, and so on. On the one hand they may be used to transform light and heat energy directly into electric energy without any complex mechanism with moving parts, and on the other hand, they are capable of generating heat or cold from electricity.

Russian engineers and scientists turned their attention to semiconductors many years ago. They saw in them a means of solving an old engineering problem, namely, that of direct conversion of heat into electricity without boilers or machines. Semiconductor thermocouples created in Russia convert heat directly into electricity just as a complex system consisting of a steam boiler, a steam engine and a generator does it.

II. Give the English equivalents for the words and word combinations below:

1) полупроводник; 2) химическое соединение; 3) сплав; 4) освобождать; 5) свойство; 6) увеличивать(ся); 7) охлаждение; 8) чувствительный к; 9) выставлять; 10) луч; 11) направлять на; 12) дистанционное управление; 13) находить, обнаруживать; 14) защита; 15) ускорение; 16) решить инженерную проблему; 17) термоэлемент.

III. Guess the meaning of the following international words:

element, organic, mineral, crystal, phenomenon, automatic, control, process, reproduction, conversion, boiler.

IV. Join the beginnings and ends:

- Semiconductors are sensitive to ... conductors of the electric current and non-conductors.
- Semiconductors convert heat into dependence of conductivity on heat and light.
- Semiconductors occupy a place between... .. heat and light.
- Semiconductors conduct electricity ...into electricity without machines.
- As a semiconductor is heated its conductivity increases as well.

V. Insert words and expressions:

- 1) Semiconductors include a great variety of (химические соединения), (сплавы металлов).
- 2) Minerals and crystals appear to possess some unexpected (свойства). Their conductivity increases with (нагревание) and falls with (охлаждение).
- 3) With the help of a ray of light directed at a semiconductor, we can effect (дистанционное управление).
- 4) The semiconductor devices are applied for (автоматический контроль) of a variety of processes, for the (воспроизведение) of sound, (ускорение) of some chemical reactions.
- 5) (Термоэлементы) created in Russia convert heat directly into electricity.

VI. Answer the questions:

- 1) What do semiconductors include? 2) How does the atomic structure of semiconductors influence their properties? 3) What phenomena influence semiconductors? 4) What are the semiconductor devices applied for? 5) How do semiconductors help in solving engineering problems?

VII. Talk on the properties of semiconductors and their practical application

Текст №8

I. Read the text

ELECTRICITY AND MAGNETISM

Text 1. Electromotive force

When free electrons are dislodged from atoms, electrical energy is released.

Chemical reaction, friction heat and electromagnetic induction will cause electrons to move from one atom to another. Whenever energy in any form is released, a force called electromotive (e. m. f.) is developed. If the force exerts its effort always in one direction, it is called direct; and if the force changes its direction of exertion periodically, it is called alternating.

The chemical reaction in a dry cell, heat and friction are sources of a unidirectional force. Electromagnetic induction produces an alternating force. The direction of force depends on the direction in which the field is cut. Whenever an e. m. f. is developed, there is also a field of energy called an electrostatic field, which can be detected by an electroscope and measured by an electrometer.

Text 2 Electromagnetic Induction

An electromotive force is induced in the conductor when there is a change in the magnetic field surrounding a conductor. This induced electromotive force may be produced in several ways as follows:

- a. A conductor may move in a stationary magnetic field of constant strength.
- b. A stationary conductor may be exposed 'to a moving magnetic field of constant strength.
- c. The strength of the field surrounding the conductor may change without any motion of conductor or magnetic circuit.

The electromotive force induced by motion of a conductor or a magnetic flux is the same when the conductor rotates and the flux is stationary or the flux rotates and the conductor is stationary. If both, conductor and flux, rotate in the same direction at the same speed, no electromotive force will be produced, if they rotate at the same speed but in opposite directions, the electromotive force induced would be twice as that which would be induced, if one of them was stationary. An electromotive force is not induced when a conductor is moved parallel to the lines of force, but only when it moves at an angle with these lines.

Any motion across the direction of the lines, however, will produce an electromotive force in the conductor. For this reason, the conductor is said to «cut» the lines of force. The actual electromotive force induced in the conductor depends upon the nature at which the flux is cut.

Text 3 Electromotive force and resistance

The electromotive force is the very force that moves the electrons from one point in an electric circuit towards another. In case this e. m. f. is direct, the current is direct. On the other hand, were the electromotive force alternating, the current would be alternating, too. The e. m. f. is measurable and it is the volt that is the unit used for measuring it. A current is unable to flow in a circuit consisting of metallic wires alone. A source of an e. m. f. should be provided as well. The source under consideration may be a cell or a battery, a generator, a thermocouple or a photocell, etc.

In addition to the electromotive force and the potential difference reference should be made to another important factor that greatly influences electrical flow, namely, resistance. All substances offer a certain amount of opposition, that is to say resistance, to the passage of current. This resistance may be high or low depending on the type of circuit and the material employed. Glass and rubber offer a very high resistance and, hence, they are considered as good

insulators. All substances do allow the passage of some current provided the potential difference is high enough.

Certain factors can greatly influence the resistance of an electric circuit.

They are the size of the wire, its length, and type. In short, the thinner or longer the wire, the greater is the resistance offered.

II. Give the English equivalents for the words below. Find in the text the sentences with these words and translate them

1) трение; 2) электродвижущая сила; 3) элемент; 4) параллельное соединение; 5) сопротивление; 6) электромагнитная индукция; 7) переменный ток; 8) постоянное напряжение; 9) фотоэлемент.

III. Guess the meaning of the following international words and translate them:

reaction, electrostatic, electrometer, electroscope, volt, metallic.

IV. Say whether these sentences are true or false:

1. Alternating force always exerts its effort in one direction.
2. Alternating force is produced by electromagnetic induction.
3. The electromotive force is induced by motion of a conductor.
4. Resistance is an important factor that greatly influences electrical flow.
5. The type of the material employed doesn't influence the resistance.

V. Answer the questions:

- 1) What factors cause the motion of electrons from one atom to another?
- 2) When is the electromotive force developed?
- 3) When does an electrostatic field appear?
- 4) How is the electromotive force induced?
- 5) What unit is used for measuring the electromotive force?
- 6) What are the sources of electromotive force?
- 7) What is called "resistance"?
- 8) How do the types of circuit and material influence the resistance?
- 9) Name the factors that influence the resistance.

Текст №9

I. Read the text

DYNAMOS

The term «dynamo» is applied to machines which convert either mechanical energy into electrical energy or electrical energy into mechanical energy by utilizing the principle of electromagnetic induction. A dynamo is called a generator when mechanical energy supplied in the form of rotation is converted into electrical energy. When the energy conversion takes place in the reverse order the dynamo is called a motor. Thus a dynamo is a reversible machine capable of operation as a generator or motor as desired.

A generator does not create electricity, but generates or produces an induced electromotive force, which causes a current to flow through a properly insulated system of electrical conductors external to it. The amount of electricity obtainable from such a generator is dependent upon the mechanical energy supplied. In the circuit external to a generator the e. m. f. causes the electricity to flow from a higher or positive potential to a lower or negative potential. In the internal circuit of a generator the e. m. f. causes the current to flow from a lower potential to a

higher potential. The action of a generator is based upon the principles of electromagnetic induction.

The dynamo consists essentially of two parts: a magnetic field, produced by electromagnets, and a number of loops or coils of wire wound upon an iron core, forming the armature. These parts are arranged so that the number of the magnetic lines of force of the field threading through the armature, coils will be constantly varied, thereby producing a steady e. m. f. in the generator or a constant torque in the motor.

II. Fill in the gaps with the words given below:

to convert, generator, reversible, obtainable, induction, loops

1. The term “dynamo” is applied to machines which.....either mechanical energy into electrical or on the contrary electrical energy into mechanical energy.
2. A dynamo is a machine capable of operation as a generator or motor as desired.
3. The amount of electricity from such a generator is dependent upon the mechanical energy supplied .
4. The action of a generator is based upon the principles of electromagnetic
5. The dynamo consists of two parts: a magnetic field, produced by electromagnets, and a number ofor coils of wire.

III. Find the Russian equivalents for the following English words and word combinations:

- 1) to be applied to smth.;
- 2) to convert smth. into smth.;
- 3) rotation;
- 4) to utilize;
- 5) a properly insulated system;
- 6) internal (external) circuit;
- 7) capable of operation;
- 8) positive (negative) potential;
- 9) reverse order;
- 10) energy conversion.

IV. Answer the questions

1. What term can be applied to machines converting mechanical energy into electrical?
2. What kind of machine is a dynamo?
3. What is the function of a generator?
4. What is the action of a generator based upon?
5. What parts does the dynamo consist of?

Текст №10

I. Read the text

GENERATORS

The powerful, highly efficient generators and alternators that are in use today operate on the same principle as the dynamo invented by the great English scientist Faraday in 1831. Dynamo-electric machines are used to supply light, heat and power on a large scale. These are the machines that produce more than 99.99 per cent of all the world's electric power.

There are two types of dynamos – the generator and the alternator. The former supplies d. c. which is similar to the current from a battery and the latter provides a. c. To generate electricity both of them must be continuously provided with energy from some outside source of mechanical energy such as steam engines, steam turbines or water turbines.

A generator is an electric machine, which converts mechanical energy into electric energy. There are direct-current (d. c.) generators and alternating current (a. c.) generators. Their construction is much alike. A d. c. generator consists of stationary and rotating elements. The stationary elements are: the yoke or the frame and the field structure. The yoke forms the closed circuit for the magnetic flux. The function of the magnetic structure is to produce the magnetic field.

The rotating elements are: true armature and the commutator. They are on the same shaft. The armature consists of the core and the winding. The winding is connected to the commutator. With the help of the brushes on the commutator that conduct the electric current to the line the winding is connected to the external circuit. The stationary element of an a. c. generator is called a stator. The rotating element is called a rotor. The essential difference between a d. c. generator and a. c. generator is that the former has a commutator by means of which the generated e. m. f. is made continuous, i. e. the commutator mechanically rectifies the alternating e. m. f. so that it is always of the same polarity.

D. c. generators are used for electrolytic processes such as electroplating. Large d. c. generators are employed in such manufacturing processes as steel making. The d. c. generator of small capacities is used for various special purposes such as arc welding, automobile generators, train lighting systems, etc. It also finds rather extensive use in connection with communication systems.

II. Give the Russian equivalents for the following English words and word combinations:

1) generator; 2) alternator; 3) steam turbine; 4) water turbine; 5) armature; 6) rotor; 7) stationary; 8) commutator; 9) stator; 10) yoke; 11) brushes; 12) core; 13) frame; 14) winding.

III. Fill in the blanks

1. A generator is an electric machine, which a) ----- mechanical energy into electrical energy.
2. A direct-current generator consists of b) ----- .
3. The dynamo was invented by c) ----- in 1831.
4. The d.c. generator is used for various purposes such as d) ----- .

IV. Work out the plan of the text

V. Speak on the following points:

1. The construction of a generator.
2. The direct current generators and their industrial application.

Текст №11

I. Read the text

MAIN STRUCTURAL ELEMENTS OF A D. C. MACHINE

A direct-current machine consists of two main parts, a stationary part, usually called the stator, designed mainly for producing a magnetic flux, and a rotating part, called the armature or the rotor. The stationary and rotating parts should be separated from each other by an air-gap. The stationary part of a d. c. machine consists of main poles, designed to create the main magnetic flux; commutating poles interposed between the main poles; and a frame. It should be noted here that sparkles operation of the machine would be impossible without the commutating poles. Thus, they should ensure sparkles operation of the brushes at the commutator.

The main pole consists of a laminated core the end of which facing the armature carries a pole shoe and a field coil through which direct current passes. The armature is a cylindrical body rotating in the space between the poles and comprising a slotted armature core, a winding inserted in the armature slots, a commutator, and a brush gear.

The frame is the stationary part of the machine to which are fixed the main and commutating poles and by means of which the machine is bolted to its bedplate. The ring shaped portion which serves as the path for the main and commutating pole fluxes is called the yoke. End-

shields or frame-heads which carry the bearings are also attached to the frame. Of these main structural elements of the machine the yoke, the pole cores, the armature core and the air-gap between the armature core and the pole core are known to form the magnetic circuit while the pole coils, the armature windings, the commutator and brushes should form the electric circuit of the machine.

II. Translate the following phrases, using the given variants of translation:

to consist – состоять : to consist of a stationary part and a rotating part;

separated – отдельный изолированный: the stationary and rotating parts should be separated from each other by an air gap;

to serve – служить в качестве чего-либо: the ring shaped portion or yoke serves as a path for the main and commutating pole fluxes.

III. Arrange synonyms in pairs and memorize them:

a) to consist of; to be separated from; to create; to be interposed between; to pass; to rotate;

b) to be divided with; to produce; to introduce into; to permeate; to roll; to revolve; to comprise.

IV. Write out the names of the machine parts and describe their operational characteristics

Текст №12

I. Read the text

THE ALTERNATOR

The alternator is an electric machine for generating an alternating current by a relative motion of conductors and a magnetic field. The machine usually has a rotating field and a stationary armature. In a synchronous alternator the magnetic field is excited with a direct current. The direction of an induced e. m. f. is reversed each time when a conductor passes from a pole of one polarity to a pole at another polarity. Most machines of this type are used for lighting and power, but there are alternators with a revolving armature and a stationary field. They are used in small sizes mostly for special purposes.

Any electrical machine is reversible. When a machine is driven by a source of mechanical power, it works as a generator and delivers electrical power. If it is connected to a source of electrical power, it produces mechanical energy, and operates as a motor. The alternator may also be operated as a motor.

The a-c generator, or alternator, does not differ in principle from the d. c. generator. The alternator consists of a field structure and an armature. The field structure is magnetized by a field winding carrying a direct current. An electromotive force is generated in the winding of the armature. In alternators the field is usually the rotating element and the armature is stationary. This construction has a number of advantages. Only two rings are needed with a rotating field. These rings carry only a relatively light field current, at a voltage generally of 125, and seldom exceeding 250. The insulation of such rings is not difficult. A stationary armature requires no slip rings. The leads from the armature can be continuously insulated from the armature winding to the switchboard, leaving no bare conductor. The alternator with a rotating field may be further divided into the vertical and the horizontal types.

The vertical type is usually applied for large water-wheel generators where it is desirable to mount the water turbine below the generator. The more common horizontal type is used with diesel and steam engine drive. A low speed alternator of this type is suitable for a diesel engine drive, a high speed alternator is suitable for a steam turbine drive.

II. Form nouns, denoting devices with the help of the suffix – or. Translate them

To alternate, to commute, to conduct, to generate

III. Read the text and write out the key words, characterizing the alternator

IV. Translate the following word combinations paying attention to the Participle 2

The leads from the armature can be continuously insulated from....., the vertical type of alternator applied for large water-wheel generator; alternators with a revolving armature and a stationary field used in small sizes mostly for special purposes; a machine driven by a source of mechanical power; the direction of an induced e. m. f. ...

V. State 5 questions to the text

VI. Points for discussion:

1. The structure of the alternator;
2. The application of the alternator.

Текст №13

I. Read the text

THE INDUCTION MOTOR

An induction motor like any other motor consists of a stationary part, the stator, and a rotating part, the rotor. The rotor of an induction motor is not connected electrically to the source of power supply. The currents which circulate in the rotor conductors are the result of voltage induced in the rotor in the magnetic field set up by the stator. The rotor is fitted with a set of conductors in which currents flow. As these conductors lie in the magnetic field produced by the stator, a force is exerted on the conductors and the rotor begins to revolve. The operation of the motor depends upon the production of a rotating magnetic field. The speed at which the field of an induction motor turns is called the synchronous speed of the field or of the motor.

The induction motor is the simplest of the various types of electric motors and it has found more extensive application in industry than any other type. It is made in two forms – the squirrel cage and the wound rotor, the difference being in the construction of the rotor.

The stator of the induction motor has practically the same slot and winding arrangement as the alternator and has the coils arranged to form a definite number of poles, the number of poles being a determining factor in connection with the speed at which the motor will operate. The rotor construction, however, is entirely different.

The squirrel-cage rotor is a simpler form and has been used in many machines.

Instead of coils the winding consists of heavy copper bars.

The wound-rotor type has a winding made up of well-insulated coils, mounted in groups whose end connections are brought out to slip rings. The purpose of this winding is to provide for variation in the amount of resistance included in the rotor circuit.

Provision for ventilation is made by leaving passageways through the core and frame, through which air is forced by fan vanes mounted on the rotor. In main cases the motors now built in as an integral part of the machine it is to drive.

There being no electrical connection between the rotor circuits of the induction motor and the stator circuits, or supply line, the currents which flow in the rotor bars or windings correspond to the induced voltages, the action being similar to that of a transformer with a movable secondary. With but a single phase winding on the stator, however, the torques produced in the two halves of the rotor would be in apposition, and the motor would not start. With more than one set of windings two for a two-phase motor, three for a three-phase motor a

resultant field is produced which has the effect of cutting across the rotor conductors and induces voltages in them. This field is considered to be revolving at uniform speed.

The term “revolving field” should not be taken to mean actual revolution of flux lines. The magnetic field from the coils of each phase varies in strength with changes in current value but does not move around the stator. The revolutions are those of the resultant of the three, or two, phases, as the case may be.

A motor with a single-phase winding is not self-starting but must be provided with an auxiliary device of some kind to enable the motor to develop a starting torque. The effect of the revolving field is the same as would result from actual revolution of a stator having direct-current poles. As voltages have been induced in the bars or windings of the rotor, currents start flowing as a result of these voltages, and a torque is produced which brings the motor up to speed.

II. Find in the text the English equivalents for the word combinations given below:

1) асинхронный двигатель; 2) неподвижная часть; 3) вращающаяся часть; 4) проводник; 5) одновременная скорость; 6) широкое применение; 7) паз; 8) механизм обмотки; 9) трансформатор; 10) вращающий момент.

III. Complete the following sentences according to the contents of the text

1. The Induction Motor is of electric motors and is more extensively applied in industry than any other type.
2. The purpose of this winding is for variation in the amount of resistance included in the rotor circuit.
3. The effect of is the same as would result from actual revolution of a stator having direct-current poles.

IV. Answer the following questions:

1. What parts does the induction motor consist of?
2. What are the names of its rotating and stationary parts?
3. What does the motor operation depend on?
4. How can the difference between stator and rotor construction be explained?
5. What does the term “revolving field” mean?

V. Translate the sentences from the text paying attention to the Participle Constructions:

1. The induction motor is made in two forms – the squirrel cage and the wound rotor, the difference being in the construction of the rotor.
2. The stator of the induction motor has practically the same slot and winding arrangement as the alternator and has the coils arranged to form a definite number of poles, the number of poles being a determining factor in connection with the speed at which the motor will operate.
3. There being no electrical connection between the rotor circuits of the induction motor and the stator circuits, or supply line, the currents which flow in the rotor bars or windings correspond to the induced voltages, the action being similar to that of a transformer with a movable secondary.

VI. Discuss the following points:

- 1) The construction of an induction motor;
- 2) Induction motor operation principle.

Текст №14

I. Read the text

TRANSFORMERS

One of the great advantages in the use of the alternating current is the ease with which the voltage may be changed by means of a relatively simple device known as a transformer. Although there are many different types of transformers and a great variety of different applications, the principles of action are the same in each case.

The transformer is a device for changing the electric current from one voltage to another. It is used for increasing or decreasing voltage. So the function of a transformer is to change voltage and current of an alternating system to meet requirements of the equipment used. It is known to be simple in elementary principle, and in construction that is it involves no moving parts.

Transformers change voltage through electromagnetic induction.

The principle parts of a transformer are: an iron core and, usually, two coils of insulated windings. One of them is called primary, another is called the secondary. The primary coil is connected to the source of power. The secondary coil is connected to the load. Thus, the primary is the coil to which power is supplied. The secondary is the coil from which power is taken. In scientific terms to produce an alternating magnetic flux in the iron core an alternating current must be passed through the primary coil. This flux is considered to induce electromotive force in both primary and secondary coils. The secondary coil is open – circuited. Current flows in the secondary coil when the latter is connected to the external circuit or load. The flow of current in the secondary coil tends to reduce the flux in the core. Transformers are placed inside a steel tank usually with oil to improve the insulation and also to cool the device.

II. Guess the meaning of the following international words:

1) transformer; 2) type; 3) principle; 4) electric; 5) function; 6) elementary; 7) construction; 8) induction.

III. Translate into Russian the words and expressions from the text:

1) advantage; 2) voltage; 3) relatively simple; 4) application; 5) increase; 6) to decrease; 7) to meet requirements; 8) moving parts; 9) iron core; 10) insulated windings; 11) load; 12) electromotive force; 13) to induce.

IV. Give the English equivalents to the words below:

1) переменный ток; 2) прибор; 3) принцип работы (действия); 4) электромагнитная индукция; 5) катушка; 6) первичная (вторичная) обмотка; 7) источник питания; 8) магнитный поток; 9) стальной контейнер; 10) остужать.

V. State questions to the underlined words:

1. Voltage may be changed by *a transformer*.
2. *Transformers* change voltage through electromagnetic induction.
3. Transformer is used for *increasing or decreasing voltage*.
4. The *primary winding* is connected to the source of power.
5. Transformers are placed inside *a steel tank*.

VI. Answer the questions:

1. What kind of device is a transformer?
2. What are the functions of a transformer?
3. What are the principle parts of a transformer?
4. What is the primary coil connected to?
5. What is the secondary coil connected to?
6. What are the principles of action of a transformer?
7. Where are transformers usually placed?

VI. Topics for discussion:

1. Transformer as an electric device;
2. Main parts and principles of a transformer action.

Текст №15

I. Read the text

TYPES OF TRANSFORMERS

There are different types of transformers. By the purpose they are classified into step-up transformers and step-down transformers. In a step-up transformer the output voltage is larger than the input voltage, because the number of turns on the secondary winding is greater than that of the primary. In a step down transformer the output voltage is less than input voltage as the number of turns on the secondary is fewer than that on the primary.

By the construction transformers are classified into core-type and shell type transformers. In the core-type transformers the primary and the secondary coils surround the core. In the shell type transformers the iron core surrounds the coils. Electrically they are equivalent. The difference is in the mechanical construction.

By the methods of cooling transformers are classified into air – cooled, oil – cooled and water – cooled transformers.

By the number of phases transformers are divided into single – phase and polyphase transformers.

Instrument transformers are of two types, current and potential.

A current transformer is an instrument transformer used for the transformation of a current at a high voltage into proportionate current at a low voltage.

Current transformers are used in conjunction with a.-c. meters or instruments where the current to be measured must be of low value. They are also used where high – voltage current has to be metered. A voltage transformer, which is also called a potential transformer, may be defined as an instrument transformer for the transformation of voltage from one value to another. This transformer is usually of a step – down type because it is used when a meter is installed for use on a high – voltage system.

Transformers operate equally well to increase the voltage and to reduce it.

The above process needs a negligible quantity of power.

Transformers are widely used in our everyday life. All radio – sets and all television sets are known to use two or more kinds of transformers. These are familiar examples showing that electronic equipment cannot do without transformers.

II. Guess the meaning of the following international words:

- 1) to classify;
- 2) method;
- 3) phase;
- 4) instrument;
- 5) system;
- 6) process;
- 7) radio;
- 8) television.

III. Give the English equivalents for the words below:

- 1) цель;
- 2) повышающий / понижающий трансформатор;
- 3) выходящее / входящее напряжение;
- 4) число витков;
- 5) механическое устройство;
- 6) монофазные / полифазные трансформаторы;
- 7) высокое / низкое напряжение;
- 8) определять;
- 9) работать;
- 10) незначительное количество.

IV. Translate into Russian the words and expression from the text:

- 1) core-type / shell-type transformers;
- 2) air-cooled / oil – cooled / water – cooled transformers;
- 3) current / potential transformers;
- 4) in conjunction with smth.;
- 5) to reduce;
- 6) electronic equipment.

V. Complete the sentences using the text:

1. By the purpose transformers are ...
2. By the construction transformers are ...
3. By the methods of cooling transformers are ...
4. By the number of phases transformers are ...
5. Transformers operate equally well...
6. Process of voltage changing needs...
7. Familiar examples of transformer applications are ...

VI. Answer the questions:

1. What voltage is larger in a step-up transformer and why?
2. What voltage is less in a step – down transformer and why?
3. What is the construction of a core – type transformer?
4. What is the construction of a shell – type transformer?
5. What are the two types of instrument transformers?
6. What are current transformers used for?
7. What are potential transformers used for?

VI. Topics for discussion:

1. Types of transformers;
2. Use of transformers in everyday life.

Текст №16

I. Read the text

MEASUREMENTS OF ELECTRIC VALUES

The measurement of any physical quantity applies a determination of its magnitude in terms of some appropriate unit. In the case of simple fundamental quantities such as length, mass or time, the units themselves are simple.

Electrical and magnetic quantities are, however, much less simple than length, mass or time and cannot be measured directly by comparison with a material stand. The units in which these quantities are expressed have to be defined in terms of their observable affects obtained in experimental work, e.g. the weight of silver deposited in one second by a current when it is passed through a solution of silver nitrate is a measure of the magnitude of this current.

Electrical measurements can be classified broadly as neither absolute measurements, nor secondary measurements, but the first class of such measurements is rarely undertaken.

II. Guess the meaning of the following international words:

- 1) physical; 2) system; 3) fundamental; 4) material; 5) experimental; 6) absolute; 7) class.

III. Give the English equivalents to the words below:

- 1) измерение; 2) определение; 3) соответствующая единица; 4) быть соответствующим; 5) сравнение; 6) достигать; 7) серебро; 8) широко; 9) заботиться; 10) длина.

IV. Translate into Russian the words and expressions from the text:

- 1) magnitude; 2) electrical and magnetic quantities; 3) to define; 4) observable affects; 5) to deposit; 6) secondary measurements; 7) to undertake.

V. Insert the words:

1. Magnitude of any ... (физическая величина) must be determined in terms of some appropriate ... (единица).
2. ... (единицы) are simple for simple ... (основных) quantities.

3. ... (электрические) and (магнитные) quantities cannot be measured simply.
4. These units must be ... (определены) in terms of their ... (наблюдаемые) effects obtained in... (экспериментальная работа).
5. Absolute ... (измерения) are ... (редко) undertaken.

VI. Answer the questions:

1. What do we need to measure any physical quantity?
2. What simple units for measuring of simple fundamental quantities do you know?
3. Can electrical and magnetic quantities be measured directly by comparison with a material stand?
4. How can we get units for defining electrical and magnetic quantities?
5. What types of measurement do you know?

VII. State questions to the underlined words:

1. Before we can measure, we must decide upon *a system of units*.
2. *Electric and magnetic quantities* are much less simple than fundamental quantities.
3. These quantities cannot be measured directly *by comparison with a material stand*.
4. Electrical measurements can be classified as neither absolute, nor secondary measurements. (Question-tag)

VIII. Topics for discussion:

1. Measurement of any physical quantity;
2. Measurement of electric and magnetic quantities.

Текст №17

I. Read the text

MAIN TYPES OF AMMETERS AND VOLTMETERS

Ammeters and voltmeters are made to operate on the same principle. The two principle kinds are the moving coil and moving iron types.

The electro-magnetic effect of the current is the one chiefly made use of for measuring purposes. Moving iron instruments employ this effect. The moving- iron instrument consists of a fixed coil of wire carrying the current which magnetizes a small piece of soft iron mounted on the instrument spindle. In construction there are two varieties: the repulsion type having two pieces of iron; and the attraction type having only one.

In the attraction type of the instrument the bobbin carrying the wire is oblong instead of circular, and has only a narrow slot-shaped opening in the center.

A thin flat piece of iron, which is mounted on the instrument spindle, is sucked into this opening by magnetic attraction when the current flows. Either gravity or spring control can be used on moving-iron instruments and damping is usually by means of an air-dash-pot.

A moving-coil instrument may be compared to a miniature direct-current motor in which the armature never moves more than about a quarter of a revolution.

When a current flows through the coil of a moving-coil type ammeter, it becomes a magnet, one face being of north, and the other of south polarity.

These poles are attracted by the poles of opposite polarity of the permanent magnet, and the coil tends to turn until its axis is parallel with the line joining the pole pieces of the permanent magnet. This movement is proportional to the current flowing and is opposed by the control springs. A pointer fixed to the coils moves over a graduated scale and indicates the current flowing in amperes. The scale of this type of instrument is evenly divided, but the positive

terminal must be connected to the positive terminal of the supply or the instrument tends to read backward. Such an instrument is only suitable for d. c. circuits.

Moving-coil instruments are more accurate and sensitive, but more expensive than those of moving-iron types.

II. Give the English equivalents for the following words and word combinations:

1) электромагнитный тип; 2) магнитно-электрический тип; 3) ось; 4) репульсионный тип; 5) притягивающий тип; 6) продолговатый; 7) устанавливать; 8) втягивать; 9) воздушный успокоитель.

III. Translate into Russian:

1) purpose; 2) employ; 3) slot-shaped; 4) magnetic attraction; 5) damp; 6) revolution; 7) pole; 8) axis; 9) pointer; 10) graduated scale.

IV. Answer the questions:

1. What are the two principle kinds of ammeters and voltmeters?
2. What is the construction of a moving iron instrument?
3. What are the two types of moving iron instrument?
4. How does a moving coil instrument work?
5. What instrument is suitable only for d.c.?
6. What instruments are more expensive and sensitive: moving coil or moving iron instruments?

V. Insert the words:

1. In the attraction type of the ... (механизмы) the bobbing is ... (продолговатый) instead of ... (круглый).
2. A small piece of ... (железо) is mounted on the instrument ... (ось).
3. ... (Амортизация) is usually by means of an ... (воздушный успокоитель)
4. The ... (якорь) never moves more than about a quarter of a ... (полный оборот) in a miniature d. c. motor.
5. ... (катушечный) movement is proportional to ... (движение тока) and is opposed by the ... (пружинный механизм).
6. ... (Стрелка) indicates the ... (ток) flowing in ... (ампер).
7. The ... (положительный) terminal must be connected to the ... (положительный) terminal of the ... (питание) or the ... (механизм) tends to read ... (наоборот).

VI. Topics for discussion:

1. Moving iron instruments;
2. Moving coil instruments.

3. Комплект оценочных средств для промежуточной аттестации

3.1. Практические задания (ПЗ)

Практическое задание №1

I. Translate the text.

The nature of electricity

The ancient Greeks knew that when a piece of amber is rubbed with wool or fur it achieves the power of attracting light objects. Later on the phenomenon was studied, and, the word electric, after the Greek word 'electron', meaning amber was used. Many scientists investigated electric phenomena, and during the nineteenth century many discoveries about the nature of electricity, and of magnetism, which is closely related to electricity, were made. It was found that if a sealing-wax rod is rubbed with a woollen cloth, and, a rod of glass is rubbed with a silken cloth; an electric spark will pass between the sealing-wax rod and the glass rod when they are brought near one another. Moreover, it was found that a force of attraction operates between them. An electrified sealing-wax is repelled, however, by a wax rod, and also an electrified glass rod is repelled, by a similar glass rod.

The ideas were developed that there are two kinds of electricity, which were called resinous electricity, and that opposite kinds of electricity attract one another, whereas similar kinds repel one another.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Answer the following questions:

1. When was found electric phenomena?
2. What does a force of attraction mean?
3. What kinds of electricity are there?

IV. Supply some, any, no, where required

1. ... pupils went to the river, ... to the woods.
2. ... of my friends live in Moscow.
3. ...Have you ... English dictionaries?
4. Is there ... ink in the inkstand? Yes, there is...
5. Bring ...chalk, please.
6. There is ... chalk in the box.
7. Is there ... milk in the jug? Yes, there is

V. Fill in blanks with the Past Progressive or the Past Simple Tense of the verbs in margin.

1. We ... to a lecture yesterday at ten o'clock. listen
2. She ... the piano from 11 till 12 o'clock. play
3. When he ... in, I ... my exercises. come, do
4. What ... you yesterday at 8 o'clock? do
5. Yesterday when I ... the newspaper, my sister ... to a concert over the radio. read, listen
6. She ... out of the window when I ... her. look, see
7. I ... along the street with my friend when the car ... by. Walk

VI. Choose the correct variant

1. Before you ____, don't forget to lock the door.
-are leaving -will leave -leave -shall leave
2. Please do not speak to anyone before the police ____ .
-come -are coming -'ll come, came
3. His parents will be very glad if she ____ the university.
-enter -'ll enter - enters - entered
4. When you ____ my brother, you ____ him.
-'ll see; - won't recognize; - see won't recognize; -saw, recognize; -'ll see, don't recognize
5. We won't discuss the matter until the headmaster ____ .
-'ll arrive - won't arrive - doesn't arrive -arrives

Практическое задание №2

I. Translate the text:

What is electricity?

Have you ever gotten a shock when you touched a doorknob, or seen sparks fly when you combed your hair? That's electricity.

Electricity is a type of energy that gives things the power to work. This energy comes from electrons. Scientists have learned how to use electrons to produce electricity.

I. Classes of electricity

The study of electricity may be divided into three classes or branches: magnetism, electrostatics, and electrodynamics. Magnetism is the property of the molecules of iron and certain other substances through which they store energy in a field of force because of the arrangement movement of the electrons in their atoms.

Electrostatics is the study of electricity at rest, or static electricity. Examples of this type of electricity are charges on condenser plates. Rubbing glass with silk produces static electricity. Electrodynamics is the study of electricity in motion, or dynamic electricity. The electricity which flows through wires for light and power purposes is a good example of latter type of electricity.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text:

Оборудования работающего на основе использования возобновляемых источников энергии для автономного тепло- и электроснабжения частных домов и зданий. С его помощью можно частично или полностью покрыть энергозатраты практически любого объекта;

- солнечные вакуумные водонагреватели для круглогодичного производства горячей воды;
- ветрогенераторы для выработки электроэнергии;
- солнечные фотоэлектрические батареи и товары на их основе – зарядные устройства, фонари;
- энергоэффективные светодиодные лампы.

IV. Fill in the blanks with the articles a, an, the, where necessary.

We live in ... nice flat ... new house near ... park. ... flat is on ... second floor. There are ... two rooms in it. We have also ... kitchen and ... bathroom. ... kitchen is ... big enough. As ... rule, my mother cooks for us. We spend ... lot of ... time together in ... kitchen. There is ... TV set in ...

corner of ... kitchen, and we often watch ... TV there.

V. Replace the infinitives given in brackets by the Future Progressive or the Present Simple:

1. The delegation (to start) for London as soon as they (to receive) their visas.
2. At the travel bureau they (to tell) you exactly when the train (to leave).
3. Ask the Smith if it (to take) him long to make a duplicate of this key.
4. I (not to think) I (to be able to) call on them and (to say) good-bye before I (to go) abroad.
5. If you (not to want) to climb the tree you can shake it and the apples (to fall) down to the ground.
6. If I (to go) to Moscow I usually (to stay) at my friends.
7. Ask him when he (to finish) packing.

VI. Переведите предложения. Определите, какое значение приобретают выделенные слова в контексте следующих предложений.

1. The soldier is now at his post.
2. The man did his best to get a better post.
3. I will send you the book by post.
4. The wooden gate was supported by two metal posts.

Практическое задание №3

I. Translate the text.

Electroscope

An electroscope is a sensitive instrument for detecting small electric charges. It consists of a glass-jar closed with a stopper of insulating material in which is fitted a varnished glass-tube. A rod passes through the tube. At the top of the rod there is a metal ball or disc at the bottom of the rod two pieces of gold leaf are suspended. When a charge is brought near the electroscope, a charge of opposite sign is induced on the metal ball, and a charge of the same sign appears on the two of the gold leaves. Since, the two pieces of gold leaf now have charges of like sign they repel each other.

As an example a negatively charged glass rod is brought to the electroscope. A positive charge is induced on the ball and a negative charge appears on the two pieces of gold leaf.

The polarity of a charge may be determined by means of an electroscope. We charge the electroscope negatively by touching the ball with the rod of hard rubber which is rubbed with flannel or silk. If the unknown charge is brought to the electroscope it will induce on the ball a charge of opposite polarity and on the gold leaves a charge of the same polarity as that of the unknown charge. Therefore, if the unknown charge is negative, the gold leaves will repel each other; if it is positive, they will attract.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text.

ЭЛЕКТРОСКОП, прибор для обнаружения электрического заряда. Наиболее распространен электроскоп с золотыми листочками, в котором две золотые пластинки, прикрепленные к проводнику, помещены в изолированный корпус. Если к стержню проводника подвести электрический заряд, пластинки разойдутся, и степень расхождения указывает на величину заряда.

IV. Fill in the pronouns.

When Mary came to the dining room ... took off ... coat and sat down. The waitress soon brought ... some soup. When Mary finished ... dinner ... looked at ... watch, put on ... coat and went out. (Now Mary tells her little brother John what he must do when he goes to the dining room): ... must take off ... coat and sit down. Then the waitress will bring ... some soup. When ... finish ... dinner ... must put on ... coat and go out.

V. Use the Present Indefinite, the Present Perfect or the Past Indefinite.

1. You ever (to be) to the picture gallery? - Yes, I (to be). I (to visit) it once when I was a youth and the pictures (to make) a great impression on me. Since then I (not to be) here.
2. You already (to see) the new Indian film? - Yes, I (to see) it. I (to manage) to see it yesterday. I (to go) to the cinema in the evening and (to get) two tickets easily.
3. You always (to take) books from our library? - Yes, as a rule, I (to take).
4. I (not to see) Jane lately. When you (to see) her last? - I (to meet) her two days ago. I (to think) that she (to change) very much.
5. You (to have) dinner already? - No, not yet. The waitress (to take) my order fifteen minutes ago and (not to bring) me anything yet.
6. Where you (to get) this fine new bicycle from? - My parents (to give) it to me as a birthday present.

VI. Choose the correct variant

1. I want to go shopping but if you _____ to come, you
-want, need -not want, needn't -don't want, needn't -do want, needn't
2. If you _____ on this tram it'll take you to the downtown.
- 'll get - have got - got -get
3. He _____ to the country tomorrow if the weather is fine.
- go -goes - 'll go -'d go
4. You'll understand nothing unless you _____ the book yourself.
- read -won't read -don't read - 'll read
5. You'll understand this rule after your teacher _____ it to you.
- 'll explain - explain -explains - don't explain

Практическое задание №4

I. Translate the text.

Electric currents and their properties

Conduction is the name normally given to a movement or flow of charges. The charges are usually electrons, but may also be ions when the conduction takes place in gaseous or liquid conductors, in which the ions are mobile.

How does the current flow through a wire? A metal is made up of tiny crystals which are visible under a microscope. A crystal is a regular and orderly arrangement of atoms. As it was explained, an atom is a complex particle in which tiny electrons move around nucleus. When the atoms are tightly packed as they are in a metallic solid, some of the electrons move freely between the atoms. These are called free electrons. Ordinarily, the free electrons move at random

through the metal. There must be some driving force to cause the electrons to move through the metal conductor. This driving force tending to produce the motion of electrons through a circuit is called an electromotive force or e.m. f. that moves electric charges from one point in the circuit to another.

When an electromotive force is applied to the ends of a wire the free electrons move in one direction. It is the movement of the free electrons in a conductor that induces an electric current. The greater the number of participating electrons, the greater is the flow of current.

No one has ever seen analectic current. We only know of the existence of a current by its effects. A current can heat a conductor, it can have a chemical action when passing through a solution, or it can produce a magnetic effect. We can measure currents by observing their heating, their chemical, or their magnetic effects.

There are some kinds of current, namely: a direct current (d. c, for short), an alternating current (a. c.) a pulsating current

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text.

Галогенные лампы стали применять и в быту, так как оказались достаточно экономичными и удобными в эксплуатации. Галогенная лампа, в сущности, является лампой накаливания, только вместо вакуума в ней находится специальная смесь, как правило, содержащая бром или йод, которая повышает светоотдачу лампы. При той же мощности, что и лампа накаливания, галогенная лампа имеет меньшие размеры, светит более ярко.

IV. Fill in the prepositions:

It was two o'clock when John went ... the dining-room to have dinner. Peter was already there. He sat ... a table with a book ... his hands. John took the menu ... the next table. When the waitress came, he ordered some soup and meat. "Can you bring me some white bread?" asked John. "Yes, of course, I can", answered the waitress, "I shall bring you some ... a minute". She came back ... a few minutes. "What will you have ... dessert?" she asked. John asked her to bring him some icecream. "I'm sorry", said the waitress. "It will only be ready ... half an hour".

V. Put these sentences in the Future and in the Past:

1. The tourists are shown many places of interest in our town.
2. The Moscow University is greatly admired by everybody.
3. New metro station is built in our town.
4. The poem is recited in our group.
5. We are told to wait outside.

VI. Use the Past Indefinite or the Past Perfect:

1. They (to complete) all the preparation for the fancy-dress ball by 5 o'clock.
2. On leaving the hospital the man (to thank) the doctor who (to cure) him of his disease.
3. In the morning all the passengers (to feel) good after the night they (to spend) in the comfortable sleeper.
4. During my last visit to the picture gallery I (to find) that I no longer (to like) the pictures which (to impress) me when I first (to see) them. Evidently my taste (to

change).

5. Last night he (complete) the experiment which he (to begin) some months, before.

6. They (to be) friends for some ten years before I (to meet) them.

Практическое задание №5

I. Translate the text.

Conductors, insulators, semiconductors Conductors are materials that have a large number of loosely bound valence-ring electrons; these electrons are easily knocked out of their orbit and are then referred to as free electrons. Insulators are materials in which the valence-ring electrons are tightly bound to the nucleus. In between the limits of these two major categories is a third general class of materials called semiconductors.

Capacity

When two insulated conductors, one of which is charged, are brought into contact, the charge spreads over both conductors. The uncharged conductor becomes charged. A larger conductor receives a larger part of the charge. The potential of the two conductors becomes the same as soon as they are brought into contact, but the quantity of electricity is not the same on each. The larger portion of the charge is on the larger conductor.

We say that the conductors have not the same capacity for electricity. The capacity of the conductor depends upon its size.

The capacity of the conductor is measured by the quantity of electricity which must be given to it in order to raise its potential to a given amount.

From this definition it is seen that if the capacity of a conductor increases while the quantity of electricity on it remains constant, its potential will become less.

Condenser

Any arrangement by which the capacity of a conductor is increased artificially is called a condenser.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text.

Техника безопасности:

Ни в коем случае нельзя одновременно дотрагиваться до бытовых приборов и заземленных предметов (водопроводные трубы, батареи центрального отопления и т. д.). Вполне возможно, что на корпус бытового прибора пробивает электричество. В последнее время все больше и больше приборов имеют заземление. Это делается для обеспечения безопасности потребителей. Такие бытовые приборы имеют трехжильный шнур и вилку с тремя контактами.

IV. Fill in the blanks with the articles *a, an, the* where necessary.

I have ... hobby. I like to cook. During my leisure time I make ... cakes and pies. It is not difficult to make ... pie. Sometimes my brother helps me. He is ... good boy and we get along well with ... each other. My brother usually goes ... shopping and buys ... different things, which are necessary for ... cooking. My cakes are tasty but I like ... pies ... best of all.

V. Use the Present Indefinite or the Present Perfect.

1. As a rule I (to have) ham and eggs for breakfast, but this time I (to order) an

omelet.

2. This is the house where I (to live). I (to live) here since childhood.
3. Once in a week I (to write) letters home, but I (not to write) one this week, so my next letter must be particularly long.
4. Where (to be) your monitor? "She (to go)" to the library.
5. I regularly (to see) him every morning at the tram stop, but I (not to see) him these two or three days.
6. It (to be) cold in winter in Moscow as a rule? - Yes, generally it (to be), but this winter (to be) exceptionally warm.
7. Why you (not to shave) in the morning? - I (to shave) every other day.

VI. Use the Passive Voice.

A guide will show the visitors the new buildings.

Someone told him to make a report on ancient architecture.

Mr. Smith taught her Greek and gave her a dictionary.

The teacher told John to learn the alphabet.

I will tell you another fable next time.

They invited the rest of us to go sightseeing.

The guide showed the American the Houses of Parliament.

Практическое задание №6

I. Translate the text.

Potential and difference of potential

Two bodies oppositely charged have a difference of potential or voltage is measured by the work required to carry a unit of positive charge from one body to another against the force of attraction or repulsion. The magnitude of the difference of potential depends upon the concentration of the charge and not on the amount of the charge.

If oppositely charged body and a negatively charged body are brought in contact, electrons from the body with negative charge will move over to the body having the positive charge until an equilibrium of charge has taken place.

There is a very instructive analogy between the use of the word "potential" in electricity and "pressure" in hydrostatics. Just as water tends to flow from points of higher hydrostatic pressure to points of lower hydrostatic pressure, so electricity tends to flow from points of higher electrical pressure, or potential, to points of lower electrical pressure, or potential.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate technical terms and phrases.

Аналоговые электроизмерительные приборы

Амперметры, ваттметры, вольтметры, измерительные преобразователи, индукционные, счетчики, контрольно-измерительные приборы, магнитодинамические приборы, магнитоэлектрические приборы, мультиметры, омметры, приборы выпрямительного типа, термоэлектрические приборы, фазометры, ферродинамические приборы, частотомеры, цифровые электроизмерительные приборы, электрические счётчики, электромагнитные приборы, электростатические приборы.

IV. Supply *many, much or little, a little.*

When we came to the dining-room there were ... people there already. We sat down at a table, took the menu-card and began to read it. "I shall not eat ... today", said. "... soup, some milk and ... cake-nothing else". "I never eat very ... said Mary. "But today I am hungry, and I want to eat as ... as I can: soup, meat, fish and potatoes". "But it will take a lot of time", said Peter, "and we have very ... time, you know. We have ... things to do before the lecture begins".

V. Fill in the prepositions where it is necessary.

This writer is known all ... the world. Many people are fond ... his books. I read one of his novels ... a month ago. He tells his stories ... such a way that you remember them ... a long time. Although his characters are imaginary it always seems that they live ... real life. ... the beginning of the year they made a trading expedition ... Africa. Crusoe, left ... saying good-bye to anyone. ... his way ... London he had his first experience ... a shipwreck. The ship ran ... a rock and broke ... pieces. The sailors were swallowed ... the sea.

VI. Use the Present Continuous instead of the infinitives given in brackets:

1. Look the sun (to rise). It is (to shine) brightly.
2. John (to polish) his boots and his sister (to press) her dress.
3. It (to rain)? Yes, it (to rain) very hard.
4. What you (to read) now? I (to read) stories by Maugham.
5. 10 The weather is fine. The sun (to shine) and the birds (to sing).
6. Why you (to speak) so fast?
7. Who you (to wait) for? I (to wait) for my sister.

Практическое задание №7

I. Translate the text.

Unit of electrical current and current measurement

The electron is an extremely small unit, and for thus reason it is not a convenient unit to use in the measurement of electric current or of quantity of electricity. The presence of an electric current in a circuit may be detected and its strength may be measured by a number of different methods. Each method is based upon some effect which the current produces under given conditions.

One of these effects is known as electrolytic dissociation. The properties of most conducting liquids are such that when a direct current is maintained in them, the constituent elements of the liquid are separated. For example, when two copper plates are dipped in a solution of copper sulphate and a direct current is maintained in a liquid entering at one plate, the anode, and leaving at the other, the cathode, metallic copper leaves the solution and is deposited on the cathode.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text.

Техника безопасности:

Чтобы обезопасить себя от воздействия электричества, принято работать в резиновых перчатках или стоять на резиновом коврик. Электрики (как, впрочем, и не электрики) берутся починить розетку или другой электрический прибор, не отключая ток. В таком случае они обязаны выполнять только одно правило: не замыкать собой

электрическую цепь. Поэтому они не должны касаться каких-нибудь проводников электричества, а также обоих контактов электрического провода одновременно.

IV. Fill in the blanks with the preposition required. Translate the sentences into Russian.

... week-days we work. We rest ... Sundays. I get up ... the morning. We sleep ... night. She promised to do this work ... time. We have our vacation ... January. We live ... the twentieth century. We tell the ... a clock or a watch. Our child is in the fresh air ... morning ... night. My father comes home ... noon.

V. Use the Present Simple or the Present Progressive:

1. Why you (walk) so fast today? You usually (walk) quite slowly.-1 (hurry). I am afraid to miss the train.
2. Cuckoos (not to build) nests. They (to use) the nests of other birds.
3. I always (to buy) lottery tickets, but I seldom (to win)
4. You cannot (to have) the book now because my brother (to read) it.
5. Some people (to do) everything with their left hand.
6. Who (to make) that terrible noise?-It is my son.
7. How you (to feel)?

VI. Use an adjective or a proverb.

1. What is the (proper) answer to this question?
2. If you read this joke (proper) you will understand it.
3. It was a (gay) song and she sang it (gay).
4. She spoke very (good) and everybody wondered where she had learnt to speak so fluently
5. She was (kind) to him and he was (happy).
6. The children were running among the trees laughing (happy).
7. He is a very (careful) driver.

Практическое задание №8

I. Translate the text.

How does it work?

It takes billions of electrons to make electricity operate. Electrons move through an electric wire in much the same way water moves through a garden hose. Turning on the faucet pushes the water through the hose. Pushing electrons makes electricity move through the wire.

The machine that pushes the electrons through the wire is called a generator. The wire from the generator goes to your home and into a control center, which is either a fuse box or a circuit breaker.

The fuse box controls how much electricity you use. If you try to use too much, you will "blow a fuse", and the electricity from that fuse will be cut off. A circuit breaker works differently from a fuse box. A circuit breaker does not let you use too much electricity. It cuts off the flow before there's an overload.

If you did not have a fuse box or circuit breaker, your electric wires could overheat and start a fire!

From the fuse box or circuit breaker, the wires go inside your walls to light switches and sockets. Turning on the light switch lets the electricity flow to the light, and the light goes on.

When you put a plug into a socket, electricity comes to the socket. But it doesn't flow into the lamp until the switch is turned on.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text.

Техника безопасности:

Ни в коем случае нельзя одновременно дотрагиваться до бытовых приборов и заземленных предметов (водопроводные трубы, батареи центрального отопления и т. д.). Возможно, что на корпус бытового прибора пробивает электричество. В последнее время все больше и больше приборов имеют заземление. Это делается для обеспечения безопасности потребителей. Такие бытовые приборы имеют трехжильный шнур и вилку с тремя контактами.

IV. Supply *somebody, anybody, nobody, (no one, none), something, nothing, everybody, everywhere nowhere, somewhere, anywhere* where required.

1. Good morning...! 2. He never goes by train: he goes ... by plane. 3. There is ... here. 4. He did ... all day yesterday. 5. They want chairs. They have ... to sit. 6. ... of the pupils will go to school. It is too cold. 7. ... is coming to see us. 8. She will tell us ... about her holidays. 9. He will go ... to have a little rest. 10. Is ... coming to inspect us? 11. Have you ... interesting to tell us? 12. Haven't you ... to go?

V. Replace the infinitives given in brackets by the Past Indefinite or the Past Continuous.

1. John (to write) the label when the bell (to ring) and a short man (to enter). A dog (to follow) him.
2. There (to be) silence while the man (to look) John up and down.
3. I (to see) the light in your windows as I (to pass).
4. During the dinner while he (to eat) his piece of cold meat, his aunt (to help) herself to wine.
5. While he (to read) a newspaper she (to sit) studying him, and by the look in her eyes he (to see) that she (to reflect) on something concerning him.
6. Jim half (to dream) still when he (to come) to the place of his destination.

VI. Choose the correct variant

1. I want to go shopping but if you _____ to come, you
-want, need -not want, needn't -don't want, needn't -do want, needn't
2. If you _____ on this tram it'll take you to the downtown.
- 'll get - have got - got -get
3. He _____ to the country tomorrow if the weather is fine.
- go -goes - 'll go -'d go
4. You'll understand nothing unless you _____ the book yourself.
- read -won't read -don't read - 'll read
5. You'll understand this rule after your teacher _____ it to you.
- 'll explain - explain -explains - don't explain

Практическое задание №9

I. Translate the text.

Kinds of circuits

Circuits can be divided into four classes: series, parallel, combination of serial-parallel, and network.

Series circuits are those having one closed path for the flow of electricity. All the elements, or devices which make up the circuit are connected in tandem, one after the other, so that the end of one is connected to the beginning of the other; or, in other words, the positive terminal of one is connected to the negative terminal of another. If the series circuit is opened anywhere, the current will not flow through the circuit.

A parallel circuit is one divided into two or more branches, each branch carrying part of the current. Another way of saying the same thing is that all the elements or devices are connected so that one half of the terminals are fastened to a common conductor, and the other half are fastened to another common point, or another conductor.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text.

Перегрузка электрической сети является одной из самых распространенных причин короткого замыкания. Короткое замыкание может произойти и из-за воздействия влаги.

Электроустановочные устройства – розетки и выключатели также должны быть влагозащищенными. Внутренняя проводка, а если это невозможно, то внешняя проводка должна быть хорошо изолирована.

IV. Fill in the blanks with the articles *a, an, the* where necessary.

I have ... hobby. I like to cook. During my leisure time I make ... cakes and pies. It is not difficult to make ... pie. Sometimes my brother helps me. He is ... good boy and we get along well with ... each other. My brother usually goes ... shopping and buys ... different things, which are necessary for ... cooking. My cakes are tasty but I like ... pies ... best of all.

V. Fill in the prepositions.

It was two o'clock when John went ... the dining-room to have dinner. Peter was already there. He sat ... a table with a book ... his hands. John took the menu... the next table. When the waitress came, he ordered some soup and meat. "Can you bring me some white bread?" asked John. "Yes, of course, I can", answered the waitress, "I shall bring you some ... a minute". She came back ... a few minutes.

What will you have ... dessert?" she asked. John asked her to bring him some icecream. So they took some milk, paid ... their dinner, and went out ... the street.

V. Replace the infinitives given in brackets by the Past Indefinite or the Past Continuous

1. John (to write) the label when the bell (to ring) and a short man (to enter). A dog (to follow) him.
2. There (to be) silence while the man (to look) John up and down.
3. I (to see) the light in your windows as I (to pass).
4. During the dinner while he (to eat) his piece of cold meat, his aunt (to help) herself to wine.
5. While he (to read) a newspaper she (to sit) studying him, and by the look in her eyes he (to see) that she (to reflect) on something concerning him.
6. Jim half (to dream) still when he (to come) to the place of his destination.

VI. Change the verbs in bracket by Gerunds. Put prepositions where necessary.

I have no intention ... (to stay) here any longer. She insisted ... (to help) me. Are you fond of ... (to play). They have had very much experience ... (to cast). There was no possibility ... (to come) in time. There is little chance ... (to see) him today. We have the pleasure ... (to invite) them to the evening party. We are proud ... (to fulfill) that task ahead of time.

Практическое задание №10

I. Translate the text.

Measuring devices

Ammeters and Volt meters. - Ammeters measure the current flowing in a circuit and normally have scales which are graduated or calibrated in amperes, milliamperes or microamperes.

Voltmeters are used to measure the potential difference between two points in a circuit. The calibration of voltmeters is usually in volts, millivolts or microvolts.

The main difference between the two instruments of the same type or design is in the resistance of the operating coil, identical moving units may be used for either meter. An ammeter is connected in the positive or negative lead in series with a circuit and, therefore, must have a low resistance coil, otherwise the readings will be incorrect as the coil would absorb an appreciable amount of power.

A voltmeter is connected in parallel across the points of a circuit where the difference of potential is to be measured. The resistance of the operating coil must, in this instance, be as high as possible, to limit the amount of current consumed by it, or else a drop in potential due to the meter would occur and the pointer indication would not represent the true potential difference across the circuit.

Wattmeters.- The measurement of the power in a D. C circuit at any instant can be achieved by means of an ammeter and voltmeter as the power in watts is the product of the current and the voltage. With A.C. circuits, however, the instantaneous values are always changing. To measure A.C. power correctly, therefore, it is necessary to use the third instrument to measure the phase difference. The normal practice, however, is to combine these three instruments in one which will give a direct reading of power in watts.

II. Write out from the text the sentences with verbs in the form of the Participle or the Gerund or the Subjunctive mood.

III. Translate the text.

Электроинструменты:

Как правило, в инструментах электричество используется для выработки механической энергии, однако есть и такие инструменты, которые вырабатывают тепловую энергию: паяльник, калорифер.

IV. Fill in the prepositions where it is necessary.

This writer is known all ... the world. Many people are fond ... his books. I read one of his novels ... a month ago. He tells his stories ... such a way that you remember them ... a long time. Although his characters are imaginary it always seems that they live ... real life. ... the beginning of the year they made a trading expedition ... Africa. Crusoe left ... saying good-bye to anyone. ... his way ... London he had his first experience ... a shipwreck. The ship ran ... a rock and broke ... pieces. The sailors were swallowed...the sea.

V. Replace the infinitives given in brackets by the Past Indefinite or the Past Continuous

1. John (to write) the label when the bell (to ring) and a short man (to enter). A dog (to follow) him.
2. There (to be) silence while the man (to look) John up and down.
3. I (to see) the light in your windows as I (to pass).
4. During the dinner while he (to eat) his piece of cold meat, his aunt (to help) herself to wine.
5. While he (to read) a newspaper she (to sit) studying him, and by the look in her eyes he (to see) that she (to reflect) on something concerning him.
6. Jim half (to dream) still when he (to come) to the place of his destination.

VI. Change the verbs in bracket by Gerunds. Put prepositions where necessary.

I have no intention ... (to stay) here any longer. She insisted ... (to help) me. Are

you fond of ... (to play). They have had very much experience ... (to cast). There was no possibility ... (to come) in time. There is little chance ... (to see) him today. We have the pleasure ... (to invite) them to the evening party. We are proud ... (to fulfill) that task ahead of time.

4. Критерии оценивания

«5» «отлично»– студент показывает глубокое и полное овладение содержанием программного материала по УД в совершенстве владеет понятийным аппаратом и демонстрирует умение применять теорию на практике, решать различные практические и профессиональные задачи, высказывать и обосновывать свои суждения в форме грамотного, логического ответа (устного или письменного), а также высокий уровень овладение общими и профессиональными компетенциями и демонстрирует готовность к профессиональной деятельности;

«4» «хорошо» – студент в полном объеме освоил программный материал по УД владеет понятийным аппаратом, хорошо ориентируется в изучаемом материале, осознанно применяет знания для решения практических и профессиональных задач, грамотно излагает ответ, но содержание, форма ответа (устного или письменного) имеют отдельные неточности, демонстрирует средний уровень овладение общими и профессиональными компетенциями и готовность к профессиональной деятельности;

«3» «удовлетворительно» – студент обнаруживает знание и понимание основных положений программного материала по УД но излагает его неполно, непоследовательно, допускает неточности в определении понятий, в применении знаний для решения практических и профессиональных задач, не умеет доказательно обосновать свои суждения, но при этом демонстрирует низкий уровень овладения общими и профессиональными компетенциями и готовность к профессиональной деятельности;

«2» «неудовлетворительно» – студент имеет разрозненные, бессистемные знания, не умеет выделять главное и второстепенное, допускает ошибки в определении понятий, беспорядочно и неуверенно излагает программный материал по УД не умеет применять знания для решения практических и профессиональных задач, не демонстрирует овладение общими и профессиональными компетенциями и готовность к профессиональной деятельности.

5. Информационное обеспечение

перечень учебных изданий, электронных изданий, электронных и Интернет-ресурсов, образовательных платформ, электронно-библиотечных систем, веб-систем для организации дистанционного обучения и управления им, используемые в образовательном процессе как основные и дополнительные источники.

Основные источники:

1. Английский язык для технических специальностей: учебник для СПО / А.П. Голубев, А.П. Коржавый. – 11-е изд., стер. – М.:ИЦ Академия, 2020. – 208с.

2. Английский язык в программировании и информационных системах: учебное пособие / В.А. Радовель. – М.: КНОРУС, 2018. – 240с.

3. Английский язык в программировании и информационных системах: учебное пособие / В.А. Радовель. – М.: КноРус, 2023. – 240с.

4. Английский язык для ссузов, учебное пособие / Агабекян И.П. – М.: Проспект, 2021 – 280с.

Английский язык. Грамматика. Сборник упражнений / Голицинский Ю.Б. – М.:КАРО,2020. – 576с.

Дополнительные источники:

3. Английский язык: электроэнергетика и электротехника: учебное пособие / А.А. Новикова. – Москва: ИНФРА-М, 2023. – 246с. – (Среднее профессиональное образование)

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