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группа 4-ГЭМ-22

2/46 Урок 23

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Тема: Проводники и изоляторы.

**Text «Conductors and Insulators»**

**Task 1. Read and translate the text.**

Conductors are materials having a low resistance so that current easily passes through them. The lower the resistance of the material, the more current can pass through it.

The most common conductors are metals. Silver and copper are the best of

them. The advantage of copper is that it is much cheaper than silver. Thus copper

is widely used to produce wire conductors. One of the common functions of wire

conductors is to connect a voltage source to a load resistance. Since copper wire

conductors have a very low resistance a minimum voltage drop is produced in

them. Thus, all of the applied voltage can produce current in the load resistance.

It should be taken into consideration that most materials change the value of

resistance when their temperature changes.

Metals increase their resistance when the temperature increases while carbon

decreases its resistance when the temperature increases. Thus metals have a

positive temperature coefficient of resistance while carbon has a negative

temperature coefficient. The smaller is the temperature coefficient or the less the

change of resistance with the change of temperature, the more perfect is the

resistance material.

Materials having a very high resistance are called insulators. Current passes

through insulators with great difficulty. The most common insulators are air, paper, rubber, plastics.

Any insulator can conduct current when a high enough voltage is applied to it. Currents of great value must be applied to insulators in order to make them

conduct. The higher the resistance of an insulator, the greater the applied voltage

must be.

When an insulator is connected to a voltage source, it stores electric charge and a potential is produced on the insulator. Thus, insulators have the two main

functions:

1) to isolate conducting wires and thus to prevent a short between them and

2) to store electric charge when a voltage source is applied.

1. Read the words and put down their Russian equivalents:

[ˈdaɪəɡræm] diagram

[ˌkouɪˈfɪʃənt] coefficient

[ˈfʌŋkʃən] function

[trænsˈfɔːmə] transformer

[trænsˈfəː] to transfer

2. Put down the Russian for:

load resistance

wire conductors

silver wire conductors

temperature ˈdecrease

temperature ˈincrease

3. Translate into Russian. Mind since.

1). Copper conductors are widely used since they are much cheaper than silver

ones. 2). A minimum voltage drop is produced in copper wire conductors since they have a low resistance. 3). A bulb connected to an open circuit does not light since an open circuit has no current.

4. Find answers to these questions in the text above:

1) What materials are called conductors?

2) What is the advantage of copper compared with silver?

3) What is the most common function of wire conductors?

4) Why is a minimum voltage drop produced in copper conductors?

5) What is the relation between the value of resistance and the temperature in

carbon?

6) What materials are called insulators?

7) What are the most common insulators?

8) What are the two main functions of insulators?

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