

called semiconductors. An electric current which flows in the same direction through a conductor or a current which does not change its polarity is called a direct current or a continuous current. Its abbreviation is DC. And alternating current flows first in one direction and then in the other. Its abbreviation is AC. An electric circuit is a path through which an electric current flows. This is a complete path along which electrons can transmit their charges.

Note.

- that is (i.e.) – то есть
- owing to (due to) – благодаря
- in other words – другими словами
- according to – согласно
- at least – по крайней мере
- whereas – тогда как
- neither... nor – ни... ни
- through – через
- normally – обычно

1 Check your understanding.

- 1 Read paragraph 2, find predicates in the passive voice and say what tenses they are used in.
- 2 Look through paragraph 3, comment on the use of tenses.
- 3 Read paragraphs 2-3, find Participle I, Participle II and say their functions.
- 4 Read paragraph 5, say which noun the pronoun 'it' refers to.
- 5 Look through paragraph 4, find attributes and adverbs.
- 6 Look through paragraph 6, find attribute clauses and name the words by which they are introduced.
- 7 In paragraph 3, find conditional sentence and say which word can be replaced by 'that of'.
- 8 While you read paragraph 3, find the words which are commonly followed by a more precise definition of what was said earlier.
- 9 While reading paragraphs 2-4, find the words reminding you of Russian ones.
- 10 In paragraph 3, find two synonyms to the word 'to be made up of'.
- 11 In paragraphs 1 and 2 there is a word which is translated into Russian as "явление" but its spelling is different. Why?
- 12 While you read paragraph 4, pay attention to the translation of the words 'a number of' and 'the number of'.
- 13 Find words in the text which have opposite meaning to the following: conductor, build, charge, old, negative, at rest, opposite.

2 Translate the following texts in written form.

Text 1

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.

Text 2

The energy which the Sun radiates every second is a million times greater than the energy which the world consumes every year. The solar energy that reaches the territory of Uzbekistan alone is hundred times greater than it is necessary for our whole country.

So scientists do research which helps to solve the problem of utilizing this immense supply of energy with great efficiency. Scientists constructed a very cheap water heater which uses solar energy. Such heater will be used in specially designed houses. Two such houses, each of 32 flats, are built in Tashkent. There is a factory that produces solar heaters for heating and hot water system in this country.

Text B

Key words to the text:

- 1 series circuit – цепь последовательного соединения
- 2 short circuit – короткозамкнутая цепь
- 3 the short – короток
- 4 switch – переключатель
- 5 source of supply – источник питания
- 6 fault – повреждение
- 7 open circuit – разомкнутая цепь
- 8 closed circuit – замкнутая цепь
- 9 safety device – предохранительное устройство
- 10 overload – перегрузка
- 11 electromotive force – ЭДС (электродвижущая сила)
- 12 transmission line – линия передачи

Read the text.

- 1 We know that the circuit is a complete path which carries the current from the source of supply to the load and then carries it again from the load back to the source. The purpose of the electrical source is to produce the necessary electromotive force required for the flow of current through the circuit.

2 The path along which the electrons travel must be complete otherwise no electric power can be supplied from the source to the load. Thus we close the circuit when we switch on our electric lamp.

3 If the circuit is broken or, as we generally say 'opened' anywhere, the current stops everywhere. Hence, we break the circuit when switch off our electrical devices. Generally speaking, the current may pass through solid conductors, liquids, gases, vacuum, or any combination of these. It may flow over transmission lines from power stations through transformers, cables and switches, through lamps, heaters, motors and so on.

4 There are various kinds of electric circuits such as: open circuits, closed circuits, series circuits, parallel circuits, and short circuits.

5 To understand the difference between the following circuit connections is not difficult at all. 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 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 your room and your house are generally connected in parallel.

6 Now we shall turn our attention to the short circuit sometimes called 'the short'. The short circuit often results from cable fault or wire fault. Under certain conditions, the short may cause fire, because the current flows where it must not flow. If the current flow is too great a fuse is to be used as a safety device to stop the current flow. The fuse must be placed in every circuit where there is a danger of overloading the line.

Note:

thus - таким образом

hence - следовательно

generally speaking - вообще говоря

turn one's attention - обращать внимание

the same - тот (же) самый

because - потому что, так как

otherwise - иначе

1 Look through the key words and say what the text is about.

2 Select a title for the text from the three below.

1 Use of power circuit;

2 Electric circuit;

3 Current-carrying circuit.

3 Read the text and say into how many parts it can be divided.

4 Read the text again carefully. While you read, select the item that best completes each of these sentences.

a) Electric circuit...

1 is the path along which the electrons travel.

2 is the path that can supply electric power from the source to the load.

3 is a complete path which carries the current from the source of supply to the load.

b) The current may...

1 flow from the power stations to lamps, heaters, motors.

2 flow through solid conductors, gases, vacuum.

3 flow over transmission lines from the power stations through transformers, cables and switches, through lamps, motors and so on.

c) The parallel circuit...

1 provides path along which the current may flow.

2 provides two or more paths for the passage of current.

3 supplies current to your houses.

d) The fuse...

1 is a safety device to stop the current flow.

2 is used to avoid the overloading of the line.

3 is placed in every circuit where there is a danger of overloading the line.

5 Explain the phrases in your own words.

series circuit

safety device

switch

short circuit

transmission line

parallel circuit

6 Are these statements below correct or incorrect according to the text?

1 The short results from overloading the circuit.

2 If the circuit is broken, the current stops everywhere.

3 We break the circuit when switch on our electrical devices.

4 The fuse is not used as a safety device to stop the current flow. It increases current in the circuit.

7 Correct the sentences by replacing the underlined words with a word or words from the text

a) The parallel circuit provides one path for the passage of current.

b) The purpose of the electrical source is to produce electricity for the flow of current through the circuit.

c) Switch must be placed in every circuit to protect it from the overloading of the line.

d) Lamps in our rooms are connected in series.

8 What problem might be discovered by removing the fuse from the circuit?

- 2 The path along which the electrons travel must be complete otherwise no electric power can be supplied from the source to the load. Thus we close the circuit when we switch on our electric lamp.
- 3 If the circuit is broken or, as we generally say 'opened' anywhere, the current stops everywhere. Hence, we break the circuit when switch off our electrical devices. Generally speaking, the current may pass through solid conductors, liquids, gases, vacuum, or any combination of these. It may flow over transmission lines from power stations through transformers, cables and switches, through lamps, heaters, motors and so on.
- 4 There are various kinds of electric circuits such as: open circuits, closed circuits, series circuits, parallel circuits, and short circuits.
- 5 To understand the difference between the following circuit connections is not difficult at all. 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 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 your room and your house are generally connected in parallel.
- 6 Now we shall turn our attention to the short circuit sometimes called 'the short'. The short circuit often results from cable fault or wire fault. Under certain conditions, the short may cause fire, because the current flows where it must not flow. If the current flow is too great a fuse is to be used as a safety device to stop the current flow. The fuse must be placed in every circuit where there is a danger of overloading the line.

Note:

thus – таким образом
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- 2 Electric circuit;
- 3 Current-carrying circuit.

3 Read the text and say into how many parts it can be divided.

4 Read the text again carefully. While you read, select the item that best completes each of these sentences.

- a) Electric circuit...
- 1 is the path along which the electrons travel.
 - 2 is the path that can supply electric power from the source to the load.
 - 3 is a complete path which carries the current from the source of supply to the load.
- b) The current may...
- 1 flow from the power stations to lamps, heaters, motors.
 - 2 flow through solid conductors, gases, vacuum.
 - 3 flow over transmission lines from the power stations through transformers, cables and switches, through lamps, motors and so on.
- c) The parallel circuit...
- 1 provides path along which the current may flow.
 - 2 provides two or more paths for the passage of current.
 - 3 supplies current to your houses.
- d) The fuse...
- 1 is a safety device to stop the current flow.
 - 2 is used to avoid the overloading of the line.
 - 3 is placed in every circuit where there is a danger of overloading the line.

5 Explain the phrases in your own words.

series circuit short circuit
safety device transmission line
switch parallel circuit

6 Are these statements below correct or incorrect according to the text?

- 1 The short results from overloading the circuit.
- 2 If the circuit is broken, the current stops everywhere.
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7 Correct the sentences by replacing the underlined words with a word or words from the text

- a) The parallel circuit provides one path for the passage of current.
- b) The purpose of the electrical source is to produce electricity for the flow of current through the circuit.
- c) Switch must be placed in every circuit to protect it from the overloading of the line.
- d) Lamps in our rooms are connected in series.

8 What problem might be discovered by removing the fuse from the circuit?

Reading Rules

1 Read out paying attention to different pronunciation of 'c' and 'g':

a) c - [s]: electricity, device, source, recent, spaceship, produce, advance, civil.

c - [k]: candle, called, recognition, arc, carbon, electric, factor, technical, communication, contribution, can. could, nuclear.

b) g - > [g]: progress, gas, longer, recognition, again, tungsten, forget, give, great, program.

g - > [dʒ]: engineer, imagine, energy, charge, change, general, voltage.

2 Read these word phrases out.

electricity, electric, electrically, electric arc; power, powerful; impossible, possibility; light, lighting; produce, production; charge, discharge; discover, discovery; invent, inventor, invention, invented by; recognize, recognition, world-wide recognition; differ, different, different lines; improve, improved, improvement, were improving, improved the lamp; important, importance, unimportant branch, important source of energy; industry, industrial; imagine, imagination, can't be imagined; contribute, a great contribution to; measure, measuring devices, measurement; technical, technician, technology, technique, technical progress; automation, automatic, automatically operated.

Exercises on Word Formation

1 Use the prefixes and suffixes to form new words from given below.

-ic; -ant; -ent; -ist; -tion; -or; -ful; -ous; -al; -ment; im-; dis-; in-

a) Think of possible adjectives.

Eg. use - польза

useful - полезный
useless - бесполезный

fruit - плод;
harm - вред;
care - забота, внимание;
faith - вера;

fruitful -
harmful -
careful -
faithful -

fruitless -
harmless -
careless -
faithless -

b) Think of possible adjectives.

Eg. to attract - привлекать

attractive - привлекаемый

to execute - выполнять, исполнять,
to decide - решать.

executive -
decisive -

9 Complete these definitions using the information given in the text.

- The electric current is...
- Short circuit results from...
- We close the circuit when...
- The current may pass...
- The fuse is...

10 Write a short summary (7-9 sentences) what the text is about.

11 Translate the following text in written form.

Text 1

Not long ago we began using hot underground water for heating and hot water supply, and in some cases, for generation of electricity.

Another promising field for the production of electric power is the use of ocean tides. Our engineers are engaged in designing tidal power stations of various capacities. The first station utilizing this principal began operating on the Barents Sea in 1968.

The energy of the Sun, which is being used in various ways, represents a practically unlimited source.

Using atomic fuel for the production of electricity is promising. It is a well-known fact that one pound of uranium contains as much energy as three million pounds of coal. However, the efficiency in generating power from atomic fuel is not high, namely 40 per cent.

No wonder, therefore, that scientists all over the world are doing their best to find more efficient ways of generating electricity directly from the fuel.

Text 2

At present most of the power is obtained mainly from two sources. One is from burning of coal, natural gas and oil. The second way of producing electricity is by means of generators that get their power from steam or water turbines. Electricity so produced flows through transmission lines to houses, industrial plants, etc.

It should be noted, however, that the generation of electricity by these processes is highly uneconomic. Actually only about 40 per cent of heat in the fuel is transformed into electricity. Besides, the world resources of fossil fuels are not everlasting. On the other hand the power produced by hydroelectric plants will be able to provide only a small fraction of the power required in the near future.