



<b>Class: VII</b>	<b>Department: SCIENCE 2020 -2021</b>	<b>Date: 30.08.2020</b>
<b>Worksheet No: 7</b> <b>With answers</b>	<b>Topic: ELECTRIC CURRENT AND IT'S EFFECTS</b>	<b>Note: A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT:</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>

**I. OBJECTIVE TYPE QUESTIONS:**

1. A solenoid which carries electric current behaves like a/an  
i) **Bar magnet**      ii) Electric bell      iii) Generator      iv) Insulator
2. Which of the following appliances is not based on the principle of heating effect of current?  
i) **Electric bell**      ii) Electric kettle      iii) Electric bulb      iv) Electric iron
3. A coil refers to-  
i) a fuse      ii) an electric wire  
iii) **a wire twisted in the form of a circle**      iv) none of these
4. Electric bulb converts electrical energy into-  
i) sound energy      ii) mechanical energy      iii) **light energy**      iv) magnetic energy
5. In an electric bell, which of these gets attracted to the electromagnet?  
i) the hammer      ii) **the soft iron strip**      iii) the screw      iv) none of these
6. When electric current passes through a wire, it behaves like a magnet. This is the-  
i) **Magnetic effect of current**      ii) Electrical effect of current  
iii) Heating effect of current      iv) Optical effect of current
7. Electric Bell works on the principle-  
i) Electrical energy is converted into mechanical energy  
ii) **Electrical energy is converted into sound energy**  
iii) Mechanical energy is converted into sound energy  
iv) Sound energy is converted into electrical energy

For question numbers 8-10, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below -

- i) **Both A and R are true and R is correct explanation of the assertion.**
- ii) **Both A and R are true but R is not the correct explanation of the assertion.**
- iii) **A is true but R is false.**
- iv) **A is false but R is true**

8. Assertion (A): Fuse is a safety device which prevents damages to electrical circuits and possible fires.

Reason (R): The fuse wire blows off and breaks the circuit. Thus, it prevents the fire and damage.

**[(i) Both A and R are true and R is correct explanation of the assertion.]**

9. Assertion (A): Battery is a combination of two cells **only**.

Reason (R): The positive and negative terminals are generally marked on the cells.

**[(iv) A is false but R is true]**

10. Assertion (A): The heating up of a thin conducting wire on passing an electric current through it is known as heating effect of current.

Reason(R): Various electrical appliances that are based on heating effect of current contain a coil of wire called element.

**[(ii) Both A and R are true but R is not the correct explanation of the assertion.]**

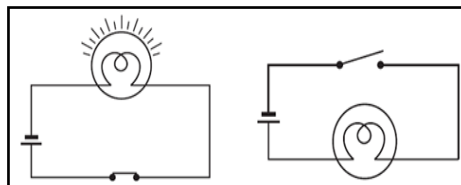
## **II. BASIC CONCEPTS LEVEL QUESTIONS:**

1. Name two electric devices for each where-

(a) heating effect of current is used- [**electric heater and geyser**]

(b) magnetic effect of current is used- [**electric bell and cranes to lift heavy magnetic materials from one place to other**]

2. Identify the types of circuits shown below and write the difference between them.



[Hint: A- Closed circuit- is a complete circuit in which the flow of current is continuous.

B- Open circuit- is an incomplete or broken circuit in which the flow of current is interrupted.]

3. Name the factors on which the heat produced in a wire depends upon.

[Hint-Type of material, length and thickness of wire]

4. What are filaments of a bulb and a heater made up of? [Hint-In a bulb, there is a thin wire called as filament made up of tungsten. When current passes through it, filament gets heated up and glows. In a heater, there is a coil of wire called element which is made up of nichrome. When current passes through element. it becomes red hot and give out heat]

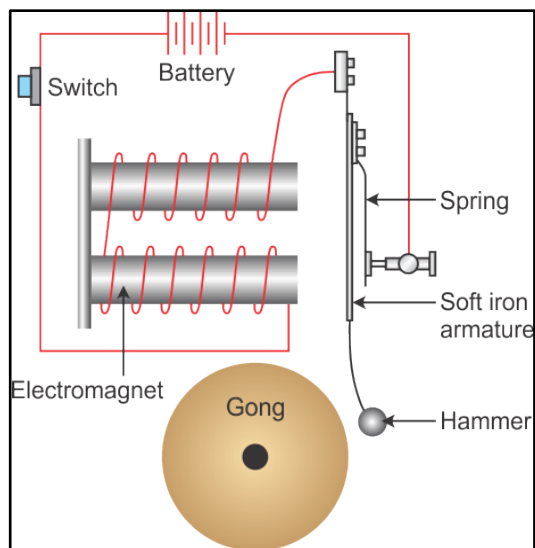
5. What are MCBs? Write the full form of it. [Hint: MCBs are safety switches used for the protection of appliances and human beings. If the current through a circuit exceeds the safety limit, it automatically turns off and protects the devices connected to the circuit. MCBs are a replacement for safety fuses, which were used earlier. MCB- Miniature Circuit Breaker.]

6. What are electromagnets? [Hint: An electromagnet is a magnet consisting of a soft iron core with a coil of insulated wire wound around it. When current flows through the wire, the core becomes magnetized. When the current ceases to flow, the core loses its magnetism.]

7. List any five uses of electromagnets. [Electromagnets are used in electric motors, electric bells, telephones, telegraphs, generators, etc. Electromagnets are used to lift the loads of iron and steel.]

### **III. INTERMEDIATE LEVEL QUESTIONS:**

1. What is short-circuiting? [Hint: When current in a circuit follows an unintended path, it is called short-circuiting. For example, in a torch circuit, if the two terminals of the bulb touch each other, the bulb will not glow. Also, if the two terminals of the battery touch each other, the torch won't work. This condition is called short-circuiting]
2. How can the strength of a magnetic field be increased? [Hint: The strength of the magnetic field can be increased by: (i) increasing the number of turns of the coil in the solenoid. (ii) increasing the strength of the electric current passing through the solenoid. (iii) winding the solenoid around a magnetic material.]
3. Why does the fuse wire have low melting point? [Hint: A fuse wire has a low melting point. Whenever the current flowing through an electric circuit exceeds the safety limit, the fuse wire heats up and melts down, resulting in a break in the path of current flow. This stops the flow of current in the circuit.]
4. Explain how to make a simple electromagnet. [Hint: Take an insulated electric wire. Remove a few centimeters of insulation from each end of the electric wire. Neatly wrap the wire around the nail in the form of a coil. Connect the free ends of the wire to the terminals of a cell. Place some iron pins near it. The pins will get attracted.]
5. Briefly explain the construction and working of an electric bell with the help of a labelled diagram.



[Hint: (a) An electric bell works with the help of an electromagnet. It is made up of a coil of wire wound round an iron piece, resembling an electromagnet. When current passes through it, a magnetic field is produced. (b) When the circuit is complete, the soft iron armature is attracted towards the electromagnet. (c) As the hammer moves towards the electromagnet, the circuit breaks. This stops the electromagnet from attracting the iron armature anymore. (d) The hammer comes back to its original position due to the spring effect. While doing so, it touches the metal connector and the circuit is complete again. This cycle continues till the key is kept ON.]

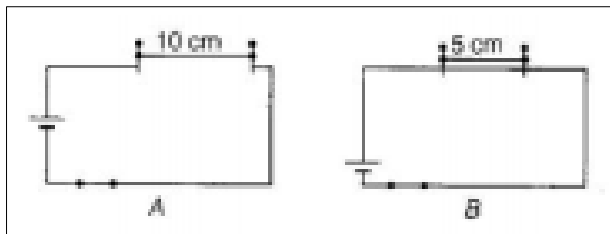
### **IV. ADVANCED LEVEL QUESTIONS-**

1. Why are fuse wires not provided in an electric circuit containing an electric cell? [Hint- Fuse wire is used to prevent sudden excess flow of current. Cell provides current of fixed magnitude. So, fuse wires are not used in circuit containing electric cell.]

2. Why are Compact Fluorescent Lamps (CFLs) preferred over electric bulbs? [Hint: CFLs are preferred over electric bulbs because electric bulbs use more electricity as some electrical energy is lost in the form of heat. However, CFLs do not waste electrical energy as heat.]
3. Can we use the same fuse in a geyser and a television set? Explain. [Hint- No, because the fuse used in every appliance has some limit to withstand the current flowing through it. So, different appliances have fuses of different ratings.]

### **V. EXEMPLAR QUESTIONS:**

1. Paheli does not have a night lamp in her room. She covered the bulb of her room with a towel in the night to get dim light. Has she taken the right step? Give one reason to justify your answer. [Hint- No, she has not taken the right step. Because due to the excessive heat of bulb, the towel may burn and it will also result in the wastage of electrical energy.]
2. Boojho made an electromagnet by winding 50 turns of wire over an iron screw. Paheli also made an electromagnet by winding 100 turns over a similar iron screw. Which electromagnet will attract more pins? Give reason. [Hint: Since, the magnetic effect directly depends on the number of turns of wire on electromagnet. So, electromagnet of Paheli will attract more pins as it has a greater number of turns of wire on it. Thus, it is a stronger electromagnet.]
3. Paheli took a wire of length 10 cm. Boojho took a wire of 5 cm of the same material and thickness. Both of them connected with wires as shown in the circuit given in figure. The current flowing in both the circuits is the same.



- (a) Will the heat produced in both the cases be equal? Explain. [Hint-No, the amount of heat produced in both the wires will be different because amount of heat produced in a wire on passing electric current depends upon the length of wire. Here length is different for both the wires.]
- (b) Will the heat produced be the same, if the wires taken by them are of equal lengths but of different thickness? Explain. [Hint-No, because amount of heat produced in a wire depends upon the thickness of the wire also.]

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