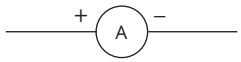
WORKSHEET 2

CHAPTER 1 – ELECTRICITY

A. Tick (✓) the correct option.

1. The SI unit of electric charge is
   a. tesla b. coulomb c. ampere d. dioptre
2. The symbol of a resistor is
   a.  b. 

   c.  d. 
3. If the potential difference across the ends of a conductor is doubled, the current flowing through it gets
   a. doubled b. halved c. zero d. none of these
4. Ohm is the SI unit of
   a. potential difference b. current c. resistance d. speed
5. The slope of the straight line on *V*-*I* graph, gives
   a. current b. resistance c. potential difference d. none of these

B. Fill in the blanks.

1. If length of the conductor is doubled, its resistance also gets _____
2. The substances which have infinitely high resistivity are called _____
3. In homes, electrical devices are connected in _____
4. The heat produced in a conductor is directly proportional to the square of _____
5. The maximum current which can flow through a fuse without melting it, is called its _____

C. State whether the given statements are true or false.

1. Every atom contains two types of charged particles – protons and electrons.
2. Conventional direction of electric current is from the negative terminal to the positive terminal of the source.
3. Electric current is the flow of protons in the conductor.
4. The resistance of a conductor is inversely proportional to its area of cross section.
5. The SI unit of resistivity is Ω m.

D. Match the following.

1. Potential difference	ampere (A)
2. Resistivity	coulomb (C)
3. Current	ohm (Ω)
4. Resistance	ohm-metre (Ω m)
5. Charge	volt (V)

Name: ..... Teacher's signature: .....

Class: X Date: .....

E. Answer the following questions.

Very Short Answer Questions

1. Define electric potential.
2. How much work is done in moving 6 C of charge across two points having potential difference 30 V?

Short Answer Questions

1. What are the factors resistivity depends on?
2. What is the main disadvantage of a series circuit?

Long Answer Questions

1. How does a fuse prevents electrical appliances from getting damaged during short circuit?
2. An electric heater of resistance 16 Ω draws 30 A from the service mains in 2 hours. Calculate the rate at which heat is developed in heater.

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

1. b
2. d
3. a
4. c
5. b

B. Fill in the blanks.

1. doubled
2. insulators
3. parallel
4. current
5. rating

C. State whether the given statements are true or false.

1. T
2. F
3. F
4. T
5. T

D. Match the following.

1.	Potential difference	volt (V)
2.	Resistivity	ohm metre (Ω m)
3.	Current	ampere (A)
4.	Resistance	ohm (Ω)
5.	Charge	coulomb (C)

E. Answer the following questions.

Very Short Answer Questions

1. The electric potential at a point in an electric field is defined as the amount of work done in bringing a unit positive charge from infinity to that point.
2. We know, $V = \frac{W}{Q}$

$$30\ V = \frac{W}{6\ C}$$

$$W = 180\ J$$

Short Answer Questions

1. The resistivity of a substance does not depend on its length or thickness. It depends on
   - the nature of the material
   - the temperature of the material (wire).
2. The main disadvantage of series circuit is that if one device (resistor) fails, the current in the whole circuit ceases to flow.

Long Answer Questions

1. When a short circuit occurs, i.e. touching of live and neutral wire takes place or overloading occurs due to flow of extremely large current in the circuit due to excessive use of electrical appliances at the same time, then the current in the circuit exceeds the specified value due to which fuse wire gets heated up, it melts and breaks the circuit. This stops the flow of current and prevents any damage that can be done to the appliances.

2. Resistance (R) = 16 Ω

Current (I) = 30 A

Time (t) = 2 h = 2 × 3600 s = 7200 s

$H = I^2Rt$

$= (30)^2 \times 16 \times 7200$

= 10,36,80,000 J

Rate at which heat is developed

$$= \frac{10,36,80,000 \text{ J}}{7200 \text{ s}} = 14,400 \text{ J/s}$$

Thus, the rate at which heat is developed in the heater is 14,400 J/s.