

ESSENCE TEST-5

— DATE : 11-08-19 —

10TH CLASS
ICSE

CURRENT ELECTRICITY

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1. Multiple choice Questions

[1×20=20]

(i) The heat produced by passing an electric current through a fixed resistor is proportional to the square of:

- (a) magnitude of resistance of the resistor
- (b) temperature of the resistor
- (c) magnitude of current
- (d) time for which current is passed

(ii) The current passing through an electric kettle has been doubled. The heat produced will become:

- (a) half
- (b) double
- (c) four times
- (d) one-fourth

(iii) An electric fuse works on the:

- (a) chemical effect of current
- (b) magnetic effect of current
- (c) lighting effect of current
- (d) heating effect of current

(iv) The elements of electrical heating devices are usually made of :

- (a) tungsten
- (b) bronze
- (c) nichrome
- (d) argon

(v) The heat produced in a wire of resistance 'x' when a current 'y' flows through it in time 'z' is given by :

- (a) $x^2 \times y \times z$
- (b) $x \times z \times y^2$
- (c) $y \times z^2 \times x$
- (d) $y \times z \times x$

(vi) Which of the following characteristic is not suitable for a fuse wire ?

- (a) thin and short
- (b) thick and short
- (c) low melting point
- (d) higher resistance than rest of wiring

- (vii) In a filament type light bulb, most of the electric power consumed appears as:
- (a) visible light (b) infra-red-rays
(c) ultraviolet rays (d) fluorescent light
- (viii) Which of the following is the most likely temperature of the filament of an electric light bulb when it is working on the normal 220 V supply line?
- (a) 500°C (b) 1500°C (c) 2500°C (d) 4500°C
- (ix) If the current flowing through a fixed resistor is halved, the heat produced in it will become:
- (a) double (b) one-half (c) one-fourth (d) four times
- (x) When an electric lamp is connected to 12 V battery, it draws a current of 0.5 A. The power of the lamp is:
- (a) 0.5 W (b) 6 W (c) 12 W (d) 24 W
- (xi) The unit for expressing electric power is:
- (a) volt (b) joule (c) coulomb (d) watt
- (xii) Which of the following is likely to be the correct wattage for an electric iron used in our homes?
- (a) 60 W (b) 250 W (c) 850 W (d) 2000 W
- (xiii) An electric heater is rated at 2 kW. Electrical energy costs Rs. 4 per kWh. What is the cost of using the heater for 3 hours?
- (a) Rs.12 (b) Rs.24 (c) Rs.36 (d) Rs.48
- (xiv) The SI unit of energy is:
- (a) joule (b) coulomb (c) watt (d) ohm-metre

(xv) The commercial unit of energy is:

- (a) watt (b) watt-hour (c) kilowatt-hour (d) kilo-joule

(xvi) How much energy does a 100 W electric bulb transfer in 1 minute?

- (a) 100 J (b) 600 J (c) 3600 J (d) 6000 J

(xvii) An electric kettle for use on a 230 V supply is rated at 3000 W. For safe working, the cable connected to it should be able to carry at least:

- (a) 2 A (b) 5 A (c) 10 A (d) 15 A

(xviii) How many joules of electrical energy are transferred per second by a 6 V ; 0.5 A lamp ?

- (a) 30 J/s (b) 12 J/s (c) 0.83 J/s (d) 3 J/s

(xix) At a given time, a house is supplied with 100 A at 220 V. How many 75 W, 220 V light bulbs could be switched on in the house at the same time (if they are all connected in parallel)?

- (a) 93 (b) 193 (c) 293 (d) 393

(xx) If the potential difference between the ends of a fixed resistor is halved, the electric power will become:

- (a) double (b) half (c) four times (d) one-fourth

2. Define the term current and state its S.I. unit. [2]
3. Two wires, one of copper and other of iron, are of the same length and same radius. Which will have more resistance? Give reason. [2]
4. Define ampere and volt with respect to ohm's law. [2]

5. Explain the statement 'the potential difference between two points is 1 volt'. [2]

6. Define the term resistance. State its S.I. unit. [2]

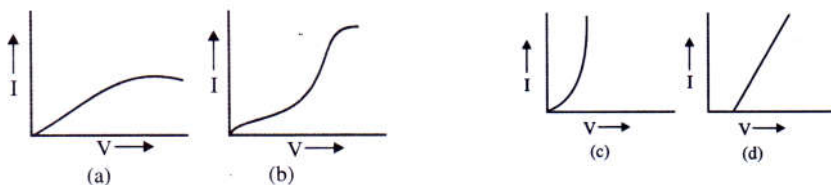
7. Which of the following statements does not represent Ohm's law?

- (a) current/potential difference = constant
- (b) potential difference/current = constant
- (c) potential difference = current x resistance
- (d) current = resistance x potential difference.

8. Which of the following is an ohmic resistance? [3]

- (a) diode (b) germanium (c) diamond (d) nichrome

9. Fig. below shows the I-V characteristic curves for four resistors. Identify the ohmic and non-ohmic conductors. Give a reason for your answer. [3]



10. Draw a V-I graph for a conductor obeying Ohm's law. What does the slope of V-I graph for a conductor represent? [3]

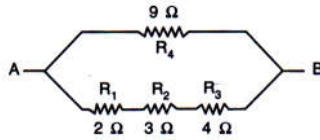
11. Name the factors on which the resistance of a wire depends. How does the resistance of a wire depend on the factors stated by you? [3]

12. Explain the term resistivity. [3]

13. Name the material used for making a fuse wire. Give a reason. [3]
14. What is a superconductor? [3]
16. Differentiate between the e.m.f. and terminal voltage of a cell. [3]
17. How does the resistance of a wire depend on its radius & length? Explain your answer. [4]
18. Two wires, one of copper and other of iron, are of the same length and same radius. Which will have more resistance? Give reason. [4]
19. State Ohm's law and draw a neat labelled circuit diagram containing a battery, a key, a voltmeter, an ammeter, a rheostat and an unknown resistance to verify it. [4]
20. On what factors does the resistivity of a wire depend? Does it depend on size and shape of the wire? [4]
21. In the circuit shown below, calculate the value of x if the equivalent resistance between A and B is 4Ω . [5]



22. Calculate the effective resistance between the points A and B in the circuit shown in fig. [5]





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