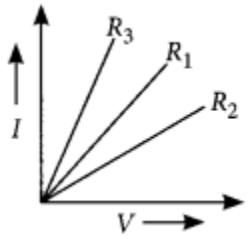
CLASS-X SUBJECT-SCIENCE (PHYSICS)

DATED: DEC.2,2023

Q1. A **student plots V-I graphs for three samples of nichrome wire with resistances R_1, R_2 and R_3. Choose from the following the statements that holds true for this graph.**



(a) $R_1 = R_2 = R_3$ (b) $R_1 > R_2 > R_3$ (c) $R_3 > R_2 > R_1$ (d) $R_2 > R_1 > R_3$

Q2.A cylindrical conductor of length 'l' and uniform area of cross section 'A' has resistance 'R'. The area of cross section of another conductor of same material and same resistance but of length '2l' is

(a) $A/2$ (b) $3A/2$ (c) 2A (d) 3A

Q3. Polarity of a current carrying solenoid can be determined by

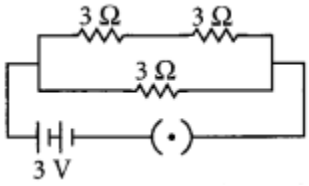
(a) use of compass needle (b) Right hand thumb rule

(c) Fleming left hand rule (d) either (a) or (b)

Q4. Calculate the resistance of a metal wire of length 2m and area of cross section 1.55×10^{-6} m², if the resistivity of the metal be 2.8×10^{-8} Ω m.

Q5.A wire has a resistance of 16 Ω. It is melted and drawn into a wire of half its original length. Calculate the resistance of the new wire. What is the percentage change in its resistance?

Q6. Three resistors of 3 Ω each are connected to a battery of 3 V as shown. Calculate the current drawn from the battery.



Q7. (i) State one difference between kilowatt and kilowatt hour. Express 1 kWh in joules.
(ii) A bulb is rated 5V; 500 mA. Calculate the rated power and resistance of the bulb when it glows.

Q8. Give reason for the following
(i) There is either a convergence or a divergence of magnetic field lines near the ends of a current carrying straight solenoid.
(ii) The current carrying solenoid when suspended freely rests along a particular direction.

Q9. State whether an alpha particle will experience any force in a magnetic field if (alpha particles are positively charged particles)
(i) it is placed in the field at rest.
(ii) it moves in the magnetic field parallel to field lines.
(iii) it moves in the magnetic field perpendicular to field lines.
Justify your answer in each case.

Q10. (a) Fuse acts like a watchman in an electric circuit. Justify this statement.
(b) Mention the usual current rating of the fuse wire in the line to (i) lights and fans (ii) appliance of 2 kW or more power.