Class 10 Science · Chapter 11: Electricity

Worksheet · 20 marks · about 40 minutes · based on NCERT

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1. The total charge carried by 2.5×10^{19} electrons is [1]

(a) 4 C (b) 0.4 C
(c) 40 C (d) 1.6 C

2. A cell drives a current of 0.6 A through a coil. The coil is replaced by another of three times the resistance, on the same cell. The current now is [1]

(a) 0.2 A (b) 1.8 A
(c) 0.6 A (d) 0.3 A

3. Meena keeps a manganin wire at room temperature and measures the current through it for several values of potential difference. Her graph of V against I is [1]

(a) a straight line meeting the V-axis above the origin (b) a straight line through the origin
(c) a curve that bends upward (d) a line parallel to the I-axis

4. Leela sets up a circuit to study a resistor. Meter M_1 is joined in line with the resistor, so that the whole current passes through it; meter M_2 is joined between the two ends of the resistor. M_1 and M_2 must be, respectively, [1]

(a) two ammeters (b) a voltmeter and an ammeter
(c) an ammeter and a voltmeter (d) two voltmeters

5. A 2 m length of uniform nichrome wire has a resistance of 14 Ω. The resistance of a 50 cm piece cut from it is [1]

(a) 3.5 Ω (b) 56 Ω
(c) 7 Ω (d) 0.875 Ω

6. Resistors of 3 Ω and 6 Ω are joined first in series and then in parallel, each time across the same 6 V supply. Find the ratio of the heat produced per second in the series arrangement to that in the parallel arrangement. [2]

7. A dry cell lying on a shelf, connected to nothing, already has a potential difference across its terminals. Yet once it lights a torch bulb it slowly runs down. Explain both observations. [2]

8. Priya says the alloy constantan should conduct better than the metal manganese, because constantan is made of copper and nickel, both good conductors. Test her claim using the resistivities: constantan 49×10^{-6} Ω m, manganese 1.84×10^{-6} Ω m. [2]

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9. An electric kettle has an element of resistance 46 Ω and works on a 230 V supply. (i) Find the current it draws and its power. (ii) How long will it take to supply 207 kJ of heat to the water, if all the heat produced goes into the water? [3]

10. A kitchen circuit at 230 V is protected by a 10 A fuse. A 1150 W microwave oven, a 460 W mixer and a 69 W tube light are running together, connected in parallel. (i) Find the current through each and the total current. (ii) Can a 1 kW toaster be switched on as well without the fuse melting? Show why. [3]

11. A lamp maker's leaflet for its filament lamps contains three points. Explain each: (i) a warning that the glass becomes very hot within minutes of switching on; (ii) the filament is held on insulating supports; (iii) the bulb is filled with nitrogen and argon. [3]