

THE SCHRAM ACADEMY

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WORKSHEET- 2 – ELECTRICITY(Problems)

FORMULAE:

1. $Q = ne$ ($e = 1.6 \times 10^{-19} \text{ C}$)
2. $I = Q/t$
3. $V = W/Q$
4. $V = IR$
5. $R = V/I$
6. $R = \rho L/A$
7. $\rho = RA/L$
8. Resistance in series (R_s): $R_s = R_1 + R_2 + R_3$
9. Resistance in parallel (R_p): $1/R_p = 1/R_1 + 1/R_2 + 1/R_3$

PROBLEMS:

1. A polythene piece rubbed with wool is found to have negative charge of $3 \times 10^{-7} \text{ C}$. Estimate the number of electrons transferred.
2. Calculate the current in a wire if 2500C charge is passed through it in 8 minutes.
3. An incandescent lamp of resistance 80Ω draws a current of 0.75A. find the line voltage.
4. An electric heater draws a current of 5 A when connected to 220 V mains. Calculate the resistance of its filament.
5. The resistance of a wire of length 5m is 100Ω . If the area of cross-section of the wire is $3 \times 10^{-7} \text{ m}^2$. Calculate the resistivity of the metal.
6. Calculate the area of cross-section of a wire if its length is 1.0m, its resistance is 23Ω and the resistivity of the material is $1.84 \times 10^{-6} \Omega \text{ m}$.
7. A metal wire of resistivity $64 \times 10^{-6} \text{ ohm cm}$ and length 198cm has a resistance of 7Ω . Calculate its radius.
8. Calculate the potential difference required across a conductor of resistance 5Ω to make a current of 1.5 A flow through it.
9. A conductor carries a current of 0.2 A. Find the amount of charge that will pass through the cross-section of the conductor in 30s. how many electrons will flow in this time interval if the charge on one electron is $1.6 \times 10^{-19} \text{ C}$?
10. Three resistors of 2Ω , 3Ω and 4Ω are connected in (a) series (b) parallel. Find the equivalent resistance in each case.