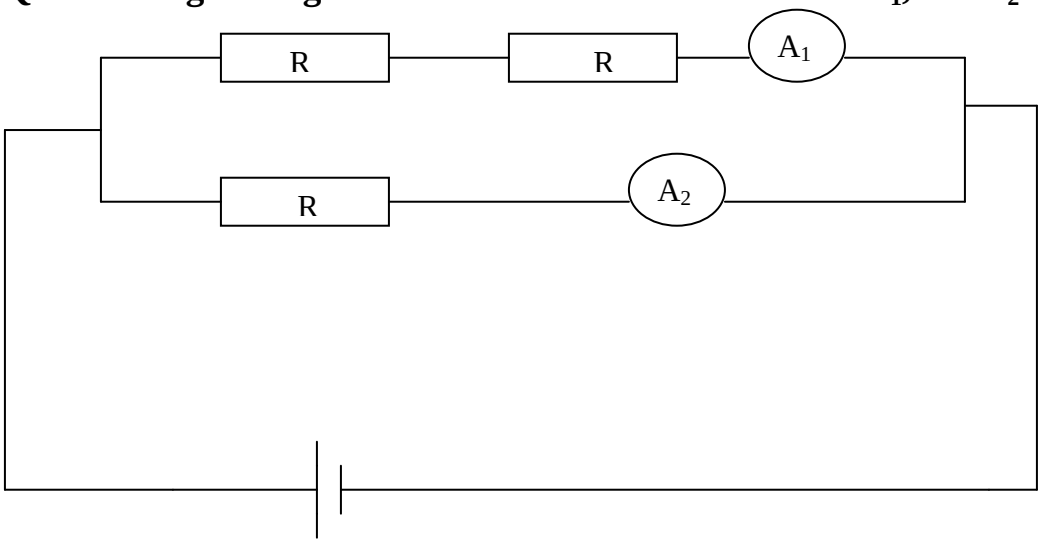
Chapter - 12

Electricity

(1 Mark Questions)

Q-1 In the given figure what is the ratio of current in A_1,and A_2



Ans-V=IR V=const.

$I \propto 1/R$ $I_1/I_2 = R/2R$ $I_1/I_2 = 1/2$

Q-2 A wire of resistance R is bent in form of a closed circle, what is the resistance across a diameter of the circle?

Ans-$1/R' = 1/(R/2)+1/(R/2)$ $R'=R/4$.

Q-3 A charge of 6 C is moved between two points P and Q having , potential 10V and 5V respectively. Find the amount of work done.

Ans-$W=q(V_2-V_1)=6(10-5)=30$ joule

Q-4 Name the physical quantity whose SI unit is $JC^{-1.}$

Ans-Potential

(2 Marks Questions)

Q-1 Two wires of equal cross sectional area , one of copper and other of manganin have same resistance. Which one will be longer?

Ans-$R=\rho L/A$ $(R,A=\text{const}.L=1/\rho)$

$\rho_{\text{manganin}} > \rho_{\text{copper}}$

$L_{\text{copper}} > L_{\text{manganin}}$

Q-2 A Rectangular block of iron has dimensions L X L X b. What is the resistance of the block measured between the two square ends ? Given ρ= resistivity.

Ans-$R=\rho\, b/L^2$

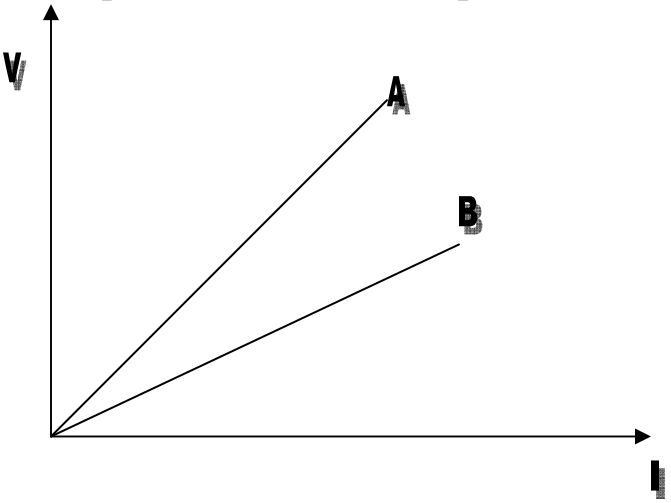
Q-3 Three equal resistances are connected in series then in parallel. What will be the ratio of their Resistances?

Ans-R_{series} =3R.

$R_{parallel}$ =R/3

R_{series} / $R_{parallel}$ =3R/(R/3)=9

Q-4 Jusitfy for any pair of resistance the equivalent resistance in series is greater equivalent resistance in parallel .



Ans- Since, R=V/I

$R_A > R_B$

A=Series,B=Parallel

Q-5 How many bulbs of 8Ω should be joined in parallel to draw a current of 2A from a battery of 4 V?

Ans-R=V/I=4/2=2 Ω, let 'n' be the no of bulbs.

$1/R=1/R_1 + 1/R_2 + \ldots\ldots 1/R_n = n/8$

½=n/8, n=4.

Q-6 Two cubes A and B are of the same material. The side of B is thrice as that of A. Find the ratio R_A/R_B.

Ans-$R_A = \rho L/A$ $R_B = \rho 3L/9A$

$R_A : R_B = 3:1$

Q-7 3×10^{11} electrons are flowing through the filament of bulb for two minutes. Find the current flowing through the circuit. Charge on one electron=1.6×10^{-19} C.

Ans-$q=ne=3x10^{11}x1.6x10^{-19}=4.8x10^{8}C$

$I=q/t=4.8x10^{8}/(2x60)=4x10^{7}A$

Q-8 A nichrome wire of resistivity $100X10^{-6}$ohm- m and copper wire of resistivity $1.62X10^{-8}$ ohm-m of same length and same area of cross section are connected in series , current is passed through them, why does the nichrome wire gets heated first?

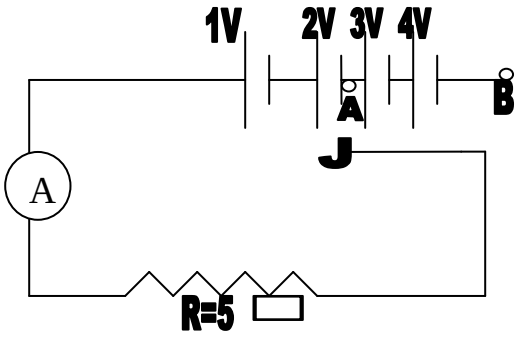
Ans. $Q=I^2 Rt$

$Q= I^2 \{ \rho L/A\}t$

Nichrome wire has higher resistivity than copper wire . Therefore, it is heated first

(3 Marks Questions)

Q1 In the given figure what is ratio of ammeter reading when J is connected to A and then to B



Ans. when J is connected to A

I=V/R=3/5A=O.6A

When J is connected to B

V=1+2+3+4=10V

I=10/5=2A