Q-1 In the given figure what is the ratio of current in A_1, and A_2
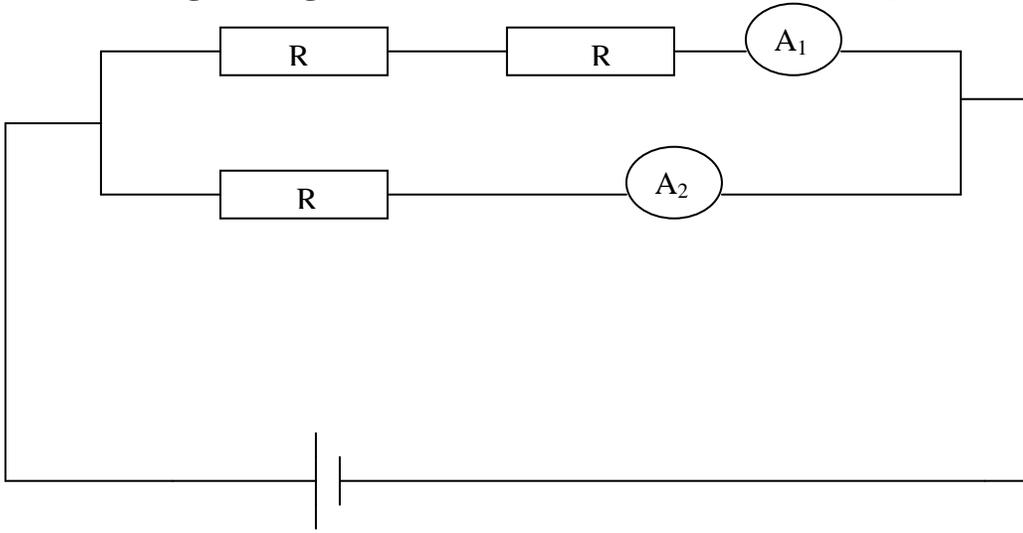
Ans-V=IR   V=const.

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

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-$R=\rho L/A$ $(R,A=const .L=1/\rho)$

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

$L_{copper} > L_{manganin}$

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 .**
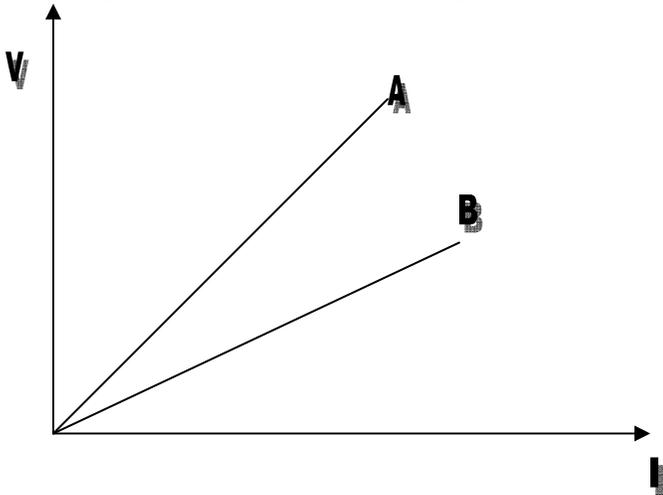
Ans- Since, $R = V/I$

$R_A > R_B$

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-$q = ne = 3 \times 10^{11} \times 1.6 \times 10^{-19} = 4.8 \times 10^{8} C$

$I = q/t = 4.8 \times 10^{8}/(2 \times 60) = 4 \times 10^{7} A$

Q-8 **A nichrome wire of resistivity 100×10^{-6} ohm- m and copper wire of resistivity 1.62×10^{-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. $Q = I^2 R t$

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

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**
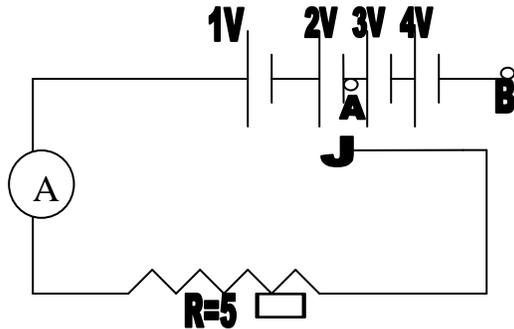
Ans. when J is connected to A

$I = V/R = 3/5A = 0.6A$

When J is connected to B

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

$I = 10/5 = 2A$