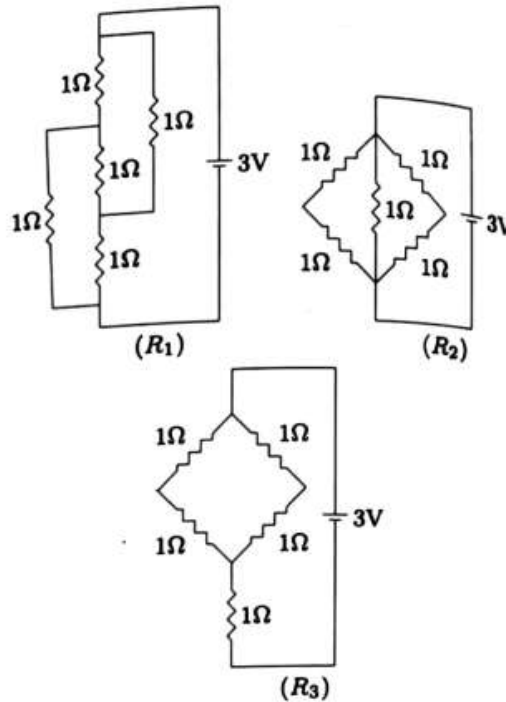


Q 09

Figure shows three resistor configurations (R_1), (R_2), and (R_3) each connected to 3 V battery. If the power dissipated by the configuration (R_1), (R_2) and (R_3) is P_1 , P_2 and P_3 , respectively, then (2008)



- (A) $P_1 > P_2 > P_3$ (B) $P_1 > P_3 > P_2$
 (C) $P_2 > P_1 > P_3$ (D) $P_3 > P_2 > P_1$

Sol. In configuration (R_1), the resistances form a balanced Wheatstone bridge. Effective resistance of this configuration is $R_1 = 2\Omega \parallel 2\Omega = 1\Omega$. The effective resistance of the configuration (R_2) is $R_2 = (2\Omega \parallel 2\Omega) \parallel 1\Omega = 1\Omega \parallel 1\Omega = 0.5\Omega$. The effective resistance of the configuration (R_3) is $R_3 = 2\Omega$. Thus, the powers dissipated in the three configurations are

$$P_1 = V^2/R_1 = 9 \text{ W},$$

$$P_2 = V^2/R_2 = 18 \text{ W}, \quad \text{and}$$

$$P_3 = V^2/R_3 = 4.5 \text{ W}.$$

Ans. C □