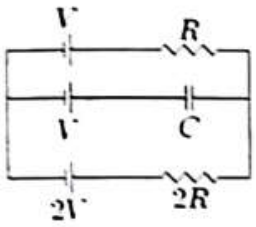
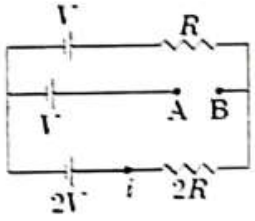
Q 07

In the given circuit, with steady current, the potential difference across the capacitor must be (2001)



(A) V (B) V/2 (C) V/3 (D) 2V/3

Sol. In the steady state, a capacitor acts like an open circuit element (see figure).



Apply Kirchhoff's loop law to get

$$2V - 2iR - iR - V = 0.$$

which gives the current $i = V/(3R)$. Traversing from B to A through the upper branch gives the potential of A w.r.t. potential of B as

$$V_A = V_B - iR - V + V = V_B - V/3.$$

Ans. C ⊡