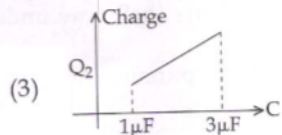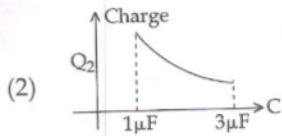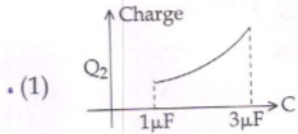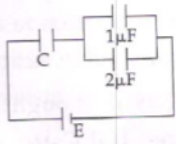12. In the given circuit, charge Q_2 on the $2\mu F$ capacitor changes as C is varied from $1\mu F$ to $3\mu F$. Q_2 as a function of 'C' is given properly by : (figures are drawn schematically and are not to scale)

(1)

(2)

(3)
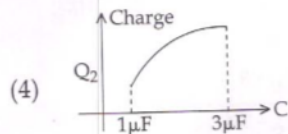
(4)
 ← Correct

Writing the eqn for the circuit which includes $2\mu F$ capacitor

$$E - \frac{q}{C} - \frac{Q_2}{2} = 0$$

(q is charge on 'c' capacitor)

$$\therefore Q_2 = 2E - \frac{2q}{C}$$

∴ as C increases, Q_2 increases

as $C \rightarrow \infty$, $Q_2 \rightarrow 2E$

Therefore as C increases, curve for Q_2 asymptotically approaches 2E.

Therefore ④ is correct