Part-17 - Problems & Solutions

(2) $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{1}{C_T}$

$\Rightarrow 2 = \frac{1}{C_T}$

$$C_T = \frac{1}{2} = 0.5$$

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(6) $Q = 10\,mC$, $C = 10\,\mu F$, $V = ?$

$$V = \frac{Q}{C} \quad [\because Q = CV]$$

$$= \frac{10 \times 10^{-3}}{10 \times 10^{-6}}$$

$$V = 1\,kV$$

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(7) $C = 10\,\mu F$, $V = 500\,V$, $W = ?$

$$W = \frac{1}{2} CV^2 \text{ joules}$$

$$W = \frac{1}{2} \times 10 \times 10^{-6} \times 500 \times 500 = 1.25\,J$$

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(10) $C = 10\,pF$, $V = 10\,kV$, $Q = ?$

$$Q = CV$$

$$= 10 \times 10^{-12} \times 10 \times 10^{3} = 100 \times 10^{-9}$$

$$= 0.1\,\mu C$$

(11) $C_T = C_1 + C_2 + C_3 \ldots = 2 + 2 + 2 + 2 = \underline{8\ \mu F}$

(12) $V_L = 12V$, $V_R = 5V$, $V = ?$

for pure RL circuit phasor diagram

$$V = \sqrt{V_R^2 + V_L^2}$$

$$= \sqrt{5^2 + 12^2} = \sqrt{169} = \underline{13 \text{ volts}}.$$

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(14) $\left[\frac{10 \times 15}{10 + 15}\right] + 12 = R_{eqn}$

$$= \frac{150}{25} + 12 = \underline{18\ \Omega}$$

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(15) $R_{eqn} = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{\left(\frac{1}{3}\right)\left(\frac{1}{4}\right)}{\frac{1}{3} + \frac{1}{4}} = \frac{\frac{1}{12}}{\frac{7}{12}} = \underline{\frac{1}{7}}$.

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