

EE 313 Answers to Final Rev Problems

① a) $\hat{I}_1 = 160 \angle -60^\circ \text{ Arms}$ b) 0.409 lagging
 $\hat{I}_2 = 40 \angle -90^\circ \text{ Arms}$

c) $P_S = 12 \text{ kW}$ $Q = 26.78 \text{ kVAR}$

d) $Z_C = 0.84 \angle -90^\circ \Omega$ $C = 3.2 \text{ mF}$

② a) $Z_{1Y} = 1.9 \angle 63.43^\circ \Omega$
 $Z_{2Y} = 10 \angle 50^\circ \Omega$
 $Z_{3\Delta} = 3.33 \angle 60^\circ \Omega$

b) $\hat{V}_{an} = 115.47 \angle 0^\circ \text{ Vrms}$ $\hat{V}_{ab} = 200 \angle 30^\circ \text{ Vrms}$
 $\hat{I}_{aA} = 211.98 \angle -61.03^\circ \text{ Arms}$ $\hat{I}_{AB} = 122.39 \angle -31.03^\circ \text{ Arms}$

c) $\hat{S}_S = 73.43 \angle 61.03^\circ \text{ kVA}$

d) $Z_{CA} = 2.28 \angle -90^\circ \Omega$ $C = 1.16 \text{ mF}$

③ $\hat{V}_{TH} = 15 - j12 \text{ Vrms}$
 $Z_{TH} = 5 - j2 \Omega$ $Z_L = 5 + j2 \Omega$
 $P_L = 1.45 \text{ W}$, Abs

④ $\hat{I}_0 = 5 \angle 90^\circ \text{ Arms}$

⑤ $\frac{\hat{V}_2}{\hat{V}_1} = 0.069 \angle -74.06^\circ$ $\frac{\hat{I}_2}{\hat{I}_1} = 0.485 \angle 14.03^\circ$

$v_o(t) = 0.196 \cos(2t - 58.39^\circ) \text{ V}$