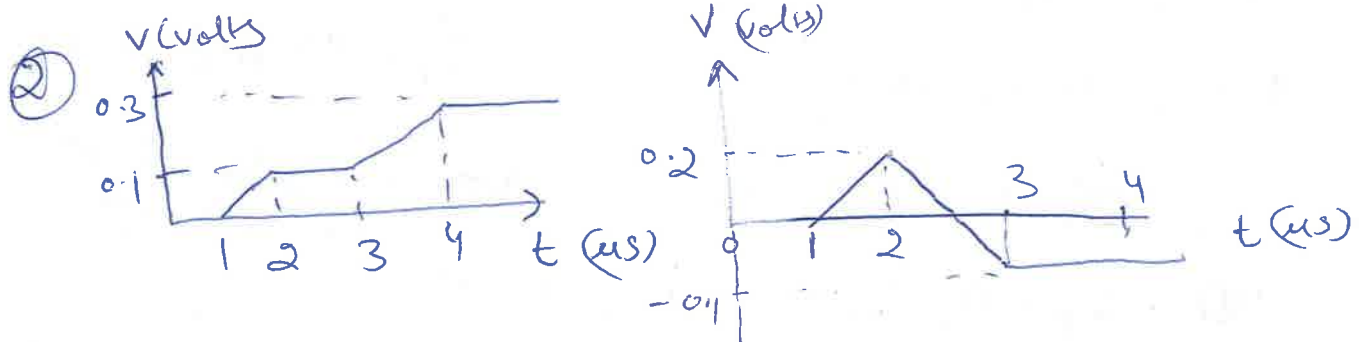
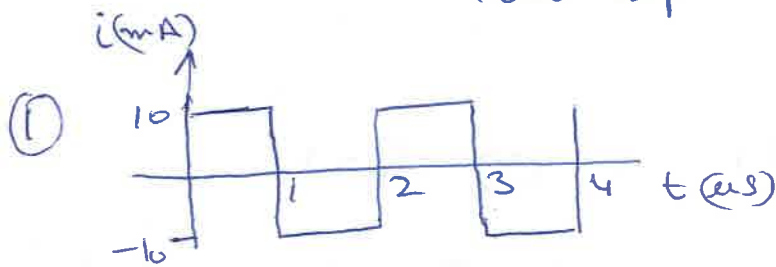


Tut - 4



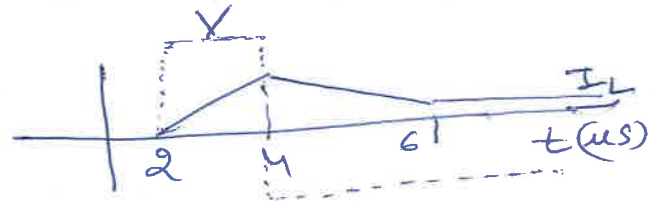
③ (a) $V_L + V_R = 12V \Rightarrow I \frac{dL}{dt} + IR = 12V$

$0 < t < 1 \mu s$ $\frac{dL}{dt} = (3-1)/(1-0) \text{ mH}/\mu s = 2 \text{ k}\Omega$; $(3 \text{ mA}) \cdot (2 \text{ k}\Omega) + R_1 = 12V$ (3 mA)

$1 < t < 2 \mu s$ $\frac{dL}{dt} = (1-3)/(2-1) \text{ mH}/\mu s = -2 \text{ k}\Omega$; $(3 \text{ mA}) \cdot (-2 \text{ k}\Omega) + R_2 = 12V$

(b) $R_1 = \frac{12-6}{3 \text{ mA}} = 2 \text{ k}\Omega$ $6V + R_1(3 \text{ mA}) = 12V$
 $R_2 = \frac{12+6}{3 \text{ mA}} = 6 \text{ k}\Omega$ $-6V + R_2(3 \text{ mA}) = 12V$

④ $t = 3 \mu s$ $I = I_L + I_R = 2 \text{ mA}$
 $t = 6 \mu s$ $I = I_L + I_R = 0 \text{ mA}$



⑤ (a) $V_C = 425 \text{ mV}$, $P_d = 14.98 \text{ mW}$, (b) $V_C = 1.2V$ $P_d = 0 \text{ W}$

⑥ (a) $V_L = 0$, $I_L = I_S = 1 \text{ mA}$ (b) $V_L = 0$ $I_L = I_S = 1 \text{ mA}$

⑦ $I = 3 \text{ mA}$, $V = 20 \text{ k} \times I = 60V$

Tut. - 6

Q.1 a) $Z_T = 10.68 \angle 1.5^\circ$

c) $F_P = 1$

b) $9.36 A \angle -1.5^\circ$

d) $I_2 = 6.27 A \angle -36^\circ$

e) $P_T = 935.68 W$

$I_1 = 5.5 A \angle 38.72^\circ$

Q.2 a) $P_R = 300 W$, $P_L = P_C = 0 W$ c) $S_R = 300 VA$, $S_C = 500 VA$
 $S_L = 900 VA$

b) ~~Q~~ $Q_R = 0$, $Q_C = 500$, $Q_L = 900 VAR$

d. $P_T = 300 W$, $Q_T = 400 VAR(L)$, $S_T = 500 VA$, $F_P = 0.6 \text{ lag.}$

Q3 a) $I_R = 3 A \angle 30^\circ$, $S = P = 180 VA$, $Q_R = 0 VAR$

b) $I_L = 6 A \angle -60^\circ$ $P_L = 0 W$, $S = Q = 360 VA$

c) $P_T = 580 W$, $Q_T = 960 VAR(L)$, $S_T = 1121.61 VA$, $F_P = 58.87^\circ$

d) $I_s = 18.63 A \angle -28.87^\circ$

Q4 a) Z_1 : $S = 126.74 VA$ Z_2 : $S = 46.92 VA$ Z_3 : $S = 38.99 VA$
b) $P = 0 W$ $P = 0 W$ $P = 38.99 W$
c)

d) $P_T = 38.99 W$, $F_P = 0.439 \text{ (lagging)}$