Name: Zahi Masarwa

Student Number: 040985420

Section: CST8216-302

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8) $R_T = R_1 + R_2 // (R_3 + R_4 // R_5)$

$R_T = 40k\Omega + 60k\Omega // 36.5k\Omega + \frac{1}{\frac{1}{6M\Omega} + \frac{1}{63k\Omega}}$

$R_T = 40k\Omega + 60k\Omega // 36.5k\Omega + 8.5k\Omega$ (40kΩ)

$R_T = 40k\Omega + \frac{1}{\frac{1}{60k\Omega} + \frac{1}{40k\Omega}} = 64k\Omega$ (24)

$\boxed{R_T = 64k\Omega}$

9) $I_T = \frac{V_S}{R_T} = \frac{120V}{64k\Omega} = 1.875mA$

$\boxed{I_T = 1.875\,mA}$

10) $V_a = V_{\text{[illegible]}} - V_{R_{\text{[illegible]}}}$

$V_a = V_{\text{[illegible]}} - I_T \cdot R_{\text{[illegible]}}$

$V_a = 120V - 1.875mA \cdot 40k\Omega = 45V$

$\boxed{V_a = 45V}$

11) $I_1 = \frac{V_{R_4}}{R_4} = \frac{45V}{60k\Omega} = 0.75mA$

$\boxed{I_1 = 0.75\,mA}$

12) $I_2 = I_T - I_1$

$I_2 = 1.875\,mA - 0.75\,mA = 1.125\,mA$

$\boxed{I_2 = 1.125\ mA}$

13) $V_D = V_a - V_{R_2}$

$V_D = 45V - 1.125\,mA \cdot 36.5\,k\Omega = 3.94\,V$

$\boxed{V_D = 3.94V}$

14) $I_3 = \frac{V_D}{R_3} = \frac{3.94V}{8\,k\Omega} = 0.4925\,mA$

$\boxed{I_3 = 492.5\ \mu A}$