



Quiz 5

Name _____

Section _____

Find the following circuit quantities

a) $R_T = 297.84 \Omega$

b) $I_T = 80.58 \text{ mA}$

$I_1 = 25.20 \text{ mA}$

$I_2 = 55.36 \text{ mA}$

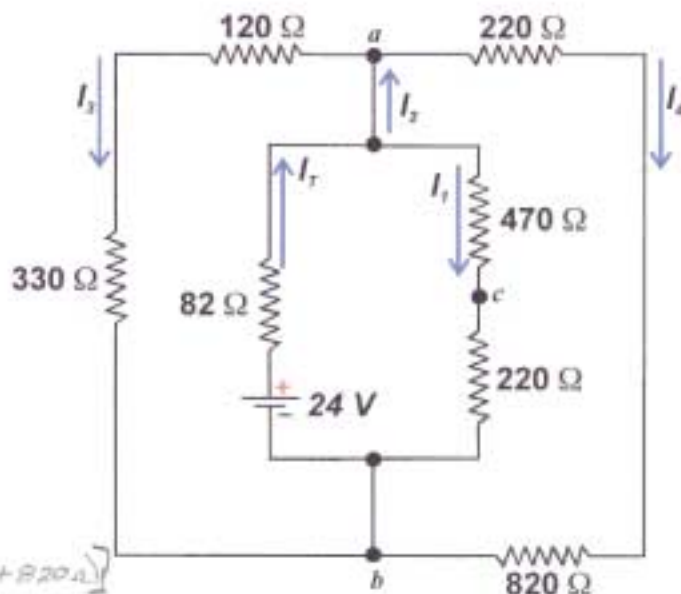
$I_3 = 38.64 \text{ mA}$

$I_4 = 16.72 \text{ mA}$

Bonus

c) $V_a = 17.39 \text{ V}$

$V_b = -5.54 \text{ V}$



$$R_T = 82 \Omega + [(470 \Omega + 220 \Omega) \parallel (120 \Omega + 330 \Omega) \parallel (220 \Omega + 820 \Omega)]$$

$$= 82 \Omega + [(690 \Omega) \parallel (450 \Omega) \parallel (1040 \Omega)]$$

$$= 82 \Omega + 215.84 \Omega$$

$$= 297.84 \Omega$$

$$I_T = \frac{E}{R_T} = \frac{24 \text{ V}}{297.84 \Omega} = 80.58 \text{ mA}$$

$$V_{R2} = (80.58 \text{ mA})(82 \Omega) = 6.61 \text{ V}$$

$$I_1 = \frac{24 \text{ V} - 6.61 \text{ V}}{690 \Omega} = 25.20 \text{ mA}$$

$$I_3 = \frac{24 \text{ V} - 6.61 \text{ V}}{450 \Omega} = 38.64 \text{ mA}$$

$$I_4 = \frac{24 \text{ V} - 6.61 \text{ V}}{1040 \Omega} = 16.72 \text{ mA}$$

$$I_2 = I_3 + I_4$$

$$= 38.64 \text{ mA} + 16.72 \text{ mA}$$

$$= 55.36 \text{ mA}$$

Assume point B of 0 Volts.

$V_b = 0$

$$V_a = 24 \text{ V} - 6.61 \text{ V}$$

$$= 17.39 \text{ V}$$

$$V_{ab} = 17.39 \text{ V} - 0 \text{ V}$$

$$= 17.39 \text{ V}$$

$V_b = 0$

$$V_c = V_{220 \Omega}$$

$$= (25.2 \text{ mA})(220 \Omega)$$

$$= 5.54 \text{ V}$$

$$V_{bc} = 0 - 5.54 \text{ V}$$

$$= -5.54 \text{ V}$$