



NORTH SOUTH UNIVERSITY
DEPARTMENT OF ELECTRICAL &
COMPUTER ENGINEERING

Class

Performance-02

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EEE141: Electrical Circuits I
Section: 6

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7.3 Here $A: R_A = 4\Omega$

$$B: R_B = R_2 \parallel R_3 \\ = R/N = 4/2 = 2$$

$$C: R_C = R_4 + R_5 \\ = 0.5 + 1.5 = 2\Omega$$

and

$$R_{B||C} = \frac{R}{N} = \frac{2\Omega}{2} = 1\Omega$$

$$R_T = R_A + R_{B||C} \\ = 4\Omega + 1\Omega = 5\Omega$$

$$I_s = \frac{E}{R_T} = \frac{10V}{5\Omega} = 2A$$

$$I_A = I_s = 2A$$

$$I_B = I_C = \frac{I_A}{2} = \frac{I_s}{2} = \frac{2A}{2} = 1A$$

$$I_{R_2} = I_{R_3} = \frac{I_B}{2} = 0.5A$$

The voltage,

$$V_A = I_A R_A = 2 \times 4 = 8V$$

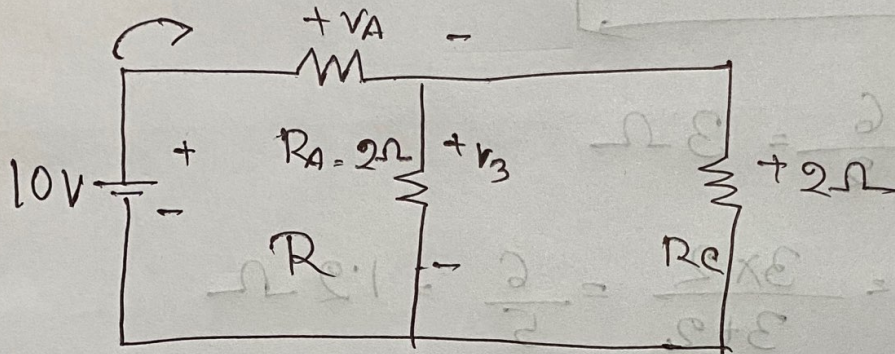
$$V_B = 1 \times 2 = 2V$$

$$V_C = V_B = 2V$$

$$\Sigma V = E - V_A - V_B = 0$$

$$E = V_A + V_B = 8V + 2$$

$$10V = 10V$$



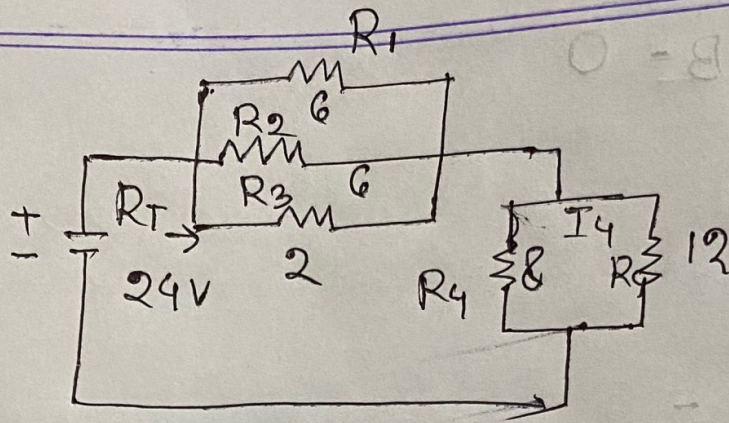
$$I_4 = \frac{E}{R_B} = \frac{E}{R_4} = \frac{12}{8} = 1.5A$$

$$R_D = R_2 \parallel R_3 = 3\Omega \parallel 6\Omega$$

$$= \frac{3 \times 6}{3 + 6} = \frac{18}{9} = 2\Omega$$

$$V_2 = \frac{R_D E}{R_D + R_C} = \frac{2 \times 12}{2 + 6} = \frac{24}{8} = 3V$$

7.6



$$R_{1||2} = \frac{R}{N} = \frac{6}{2} = 3 \Omega$$

$$R_A = R_{1||2||3} = \frac{3 \times 2}{3+2} = \frac{6}{5} = 1.2 \Omega$$

$$R_B = R_3 = R_{4||5} = \frac{(8 \Omega)(12 \Omega)}{8 \Omega + 12 \Omega} = \frac{96 \Omega}{20} = 4.8 \Omega$$

$$R_T = R_{1||2||3} + R_{4||5} = 1.2 \Omega + 4.8 \Omega = 6 \Omega$$

$$I_S = \frac{E}{R_T} = \frac{24V}{6 \Omega} = 4A$$

$$V_1 = I_S R_{1||2||3} = (4A)(1.2 \Omega) = 4.8V$$

$$V_5 = I_S R_{4||5} = (4A)(4.8 \Omega) = 19.2V$$

$$I_4 = \frac{V_5}{R_4} = \frac{19.2}{8} = 2.4A$$

$$I_2 = \frac{V_2}{R_2} = \frac{V_1}{R_2} = \frac{4.8}{6} = 0.6A$$