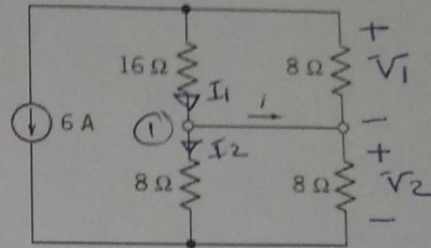


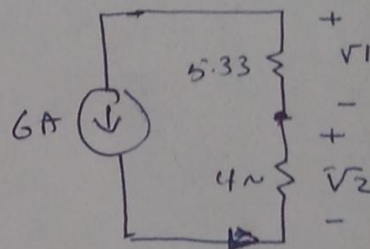
Question 4: (5 marks)

find i



$$16 \parallel 8 = \frac{16 \times 8}{16 + 8} = \frac{128}{24} = 5.33 \sim$$

$$8 \parallel 8 = \frac{8 \times 8}{8 + 8} = 4 \sim$$



$$\bar{V}_2 = (-6)(4) = -24 \text{ Volts}$$

$$\bar{V}_1 = (-6)(5.33) = -31.98 \text{ Volts}$$

KCL at Node 1

$$I_1 = i + I_2 \approx -2$$

$$I_1 = \frac{V_1}{16} = \frac{-31.98}{16} = -1.9988 \text{ A}$$

$$I_2 = \frac{V_2}{8} = \frac{-24}{8} = -3 \text{ A}$$

~~_____~~

$$-2 = i + -3$$

$$i = -2 + 3 = 1 \text{ A}$$

Course's Name : Electric circuits I

Palestine Technical University - Kadoorie

Instructor's Name : Eng. Muntaser Al-Dabe

Course's Number : 12110101

Exam's Period : 90 minutes

Questions' Number : 4

First



Exam

Total Mark : 25
Pages' Number : 4

Fall 2014

Student's Name:

Student's Number:

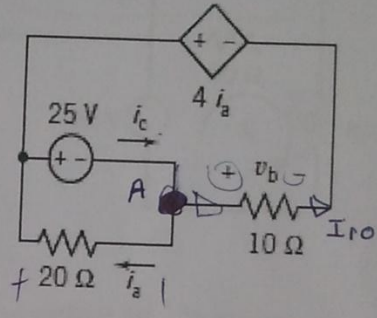
Section's Number:

Exam's Date :

Question 1 : (6 marks)

Find the following

- (a) The current i_a in the $20\text{-}\Omega$ resistor.
- (b) The voltage v_b across the $10\text{-}\Omega$ resistor.
- (c) The current i_c in the independent voltage source.



$$I_a = \frac{-25}{20} = -1.25 \text{ A} \quad \text{--- ②} \quad \text{a.s.}$$

KVL

$$-25 + 4I_a - V_b = 0$$

$$-25 + 4(-1.25) - V_b = 0$$

$$-25 + -5 - V_b = 0$$

$$V_b = -30 \quad \text{--- a.s. ②}$$

$$I_{10} = \frac{-30}{10} = -3 \text{ A}$$

KCL at A

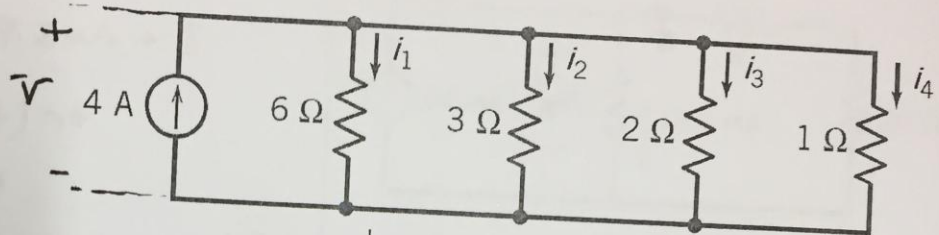
$$I_c = I_a + I_{10}$$

$$= -1.25 - 3 = -4.25 \text{ A} \quad \text{--- a.s. ②}$$

Question 3: (8 marks)

a) (4 marks)

Find i_1, i_2, i_3, i_4



KCL

$$4 = \frac{\bar{V}}{6} + \frac{\bar{V}}{3} + \frac{\bar{V}}{2} + \frac{\bar{V}}{1}$$

$$4 = \frac{\bar{V}}{6} + \frac{2\bar{V}}{6} + \frac{3\bar{V}}{6} + \frac{6\bar{V}}{6}$$

$$24 = 12 \cdot \bar{V} \quad (2)$$

$$\bar{V} = \frac{24}{12} = 2 \text{ volt}$$

$$i_1 = \frac{\bar{V}}{6} = \frac{2}{6} = 0.333 \text{ A} \quad \left(\frac{1}{2} \right) \quad \frac{1}{3}$$

$$i_2 = \frac{\bar{V}}{3} = \frac{2}{3} = 0.666 \text{ A} \quad \left(\frac{1}{2} \right) \quad \frac{2}{3}$$

$$i_3 = \frac{\bar{V}}{2} = \frac{2}{2} = 1 \text{ A} \quad \left(\frac{1}{2} \right) \quad 1$$

$$i_4 = \frac{\bar{V}}{1} = \frac{2}{1} = 2 \text{ A} \quad \left(\frac{1}{2} \right) \quad 2$$

$$\frac{1}{R_{eq}} = \frac{1}{6} + \frac{1}{3} + \frac{1}{2} + \frac{1}{1}$$

$$\frac{1}{R_{eq}} = \frac{1}{6} + \frac{2}{6} + \frac{3}{6} + \frac{6}{6}$$

$$\frac{1}{R_{eq}} = \frac{12}{6} = 2$$

$$R_{eq} = \frac{1}{2} \rightarrow V = 4 \times \frac{1}{2} = 2 \text{ volt}$$

$$I_1 = \frac{2}{6} \text{ A}$$

$$I_2 = \frac{2}{3} \text{ A}$$

$$I_3 = \frac{2}{2} = 1 \text{ A}$$

$$I_4 = \frac{2}{1} = 2 \text{ A}$$

b) (4 marks)

Find values of R_1 and R_2

KCL

$$24 \text{ mA} = 19.2 \text{ mA} + I$$

$$I = (24 - 19.2) \text{ mA}$$

$$I = 4.8 \text{ mA}$$

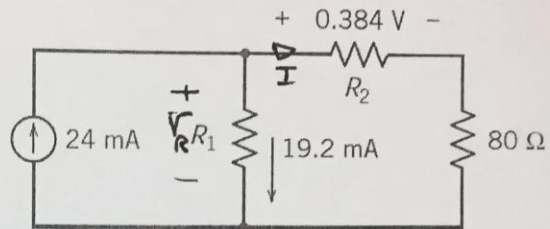
$$R_2 = \frac{0.384}{4.8 \text{ mA}} = 80 \Omega \quad (2)$$

$$V_R = I(80 + 80)$$

$$V_R = (4.8 \text{ mA})(160)$$

$$V_R = 0.768 \text{ V} \quad (2)$$

$$R_1 = \frac{0.768}{19.2 \text{ mA}} = 40 \Omega$$



انتهت الاسئلة

End Of Questions