



بسم الله الرحمن الرحيم

University of Technology -Electromechanical Engineering Dept.
Final Exam-First Attempt 2013-2014

Stage : first year

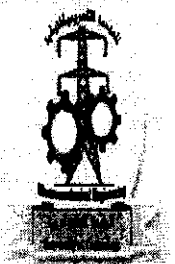
Branch : systems

Subject : Fundamentals of Electrical Engineering

Examiner :Najat sh.Jasim

Time : 3 hours

Date : 17 / 6 / 2014



Note : answer only five questions

Name:

ID No.

Signature:

- Q1.a) Find the unknown quantities for the circuit in Fig (a) using the information provided.
b) Using the voltage divider rule, find the indicated voltage in Fig (b).
c) For the parallel network in Fig (c), determine current I_1 using the current divider rule.
d) Using Kirchhoff's voltage law, determine the unknown voltage for the circuit in Fig (d).

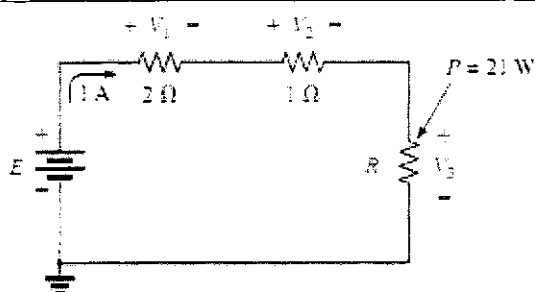


Fig (a)

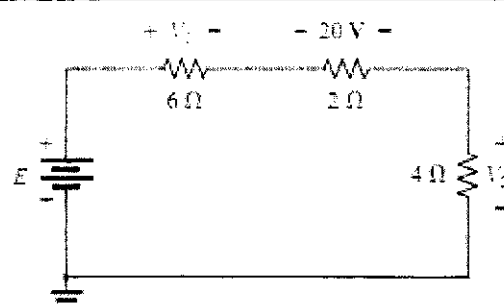


Fig (b)

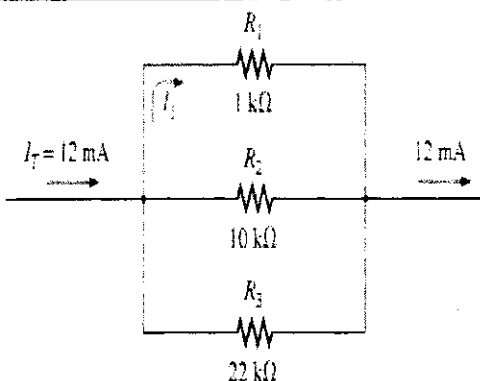


Fig (c)

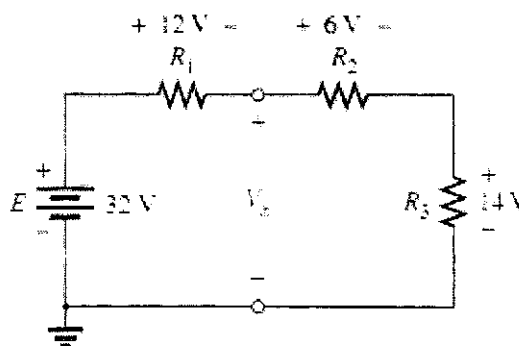
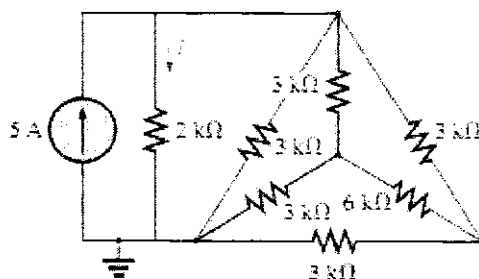


Fig (d)

(12 MARKS)

- Q.2) Determine the current I for the network in Fig shown below.



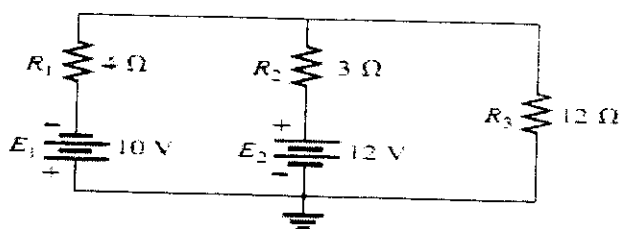
(12 MARKS)

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Q3.a) Using branch-current analysis, find the magnitude and direction of the current through each resistor for the network in Fig shown below.

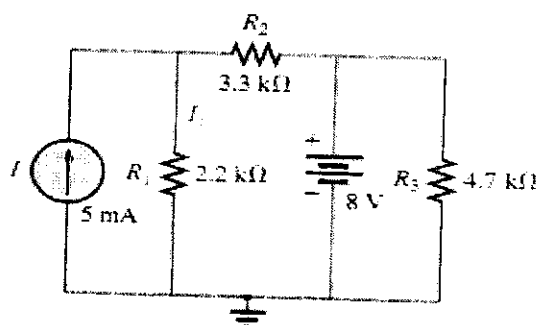
b) Using Mesh (Loop) Analysis Find the current through each resistor for the network in Fig shown below.



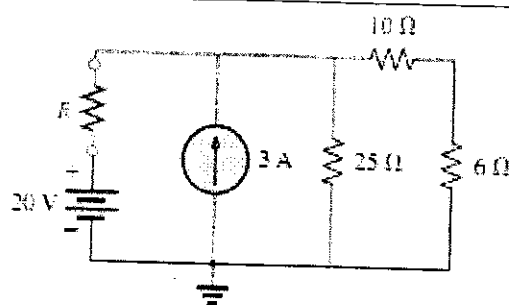
(12 MARKS)

Q4.a) Using superposition, find the current through R_1 for the network in Fig(a).

b) Find the Thévenin equivalent circuit for the network external to the resistor R in the network in Fig(b)



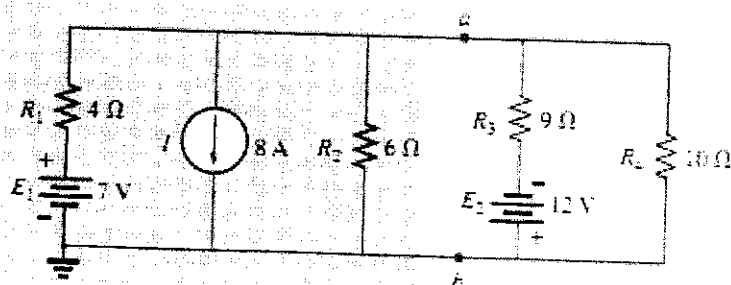
Fig(a)



Fig(b)

(12 MARKS)

Q.5) Find the Norton equivalent circuit for the portion of the network to the left of a-b in Fig shown below.



(12 MARKS)

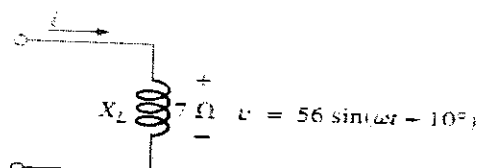
Q6. a) What is the phase relationship between the sinusoidal waveforms of following set ? Explain by draw the waveforms.

$$i = 2 \cos(\omega t + 10^\circ)$$

$$v = 3 \sin(\omega t - 10^\circ)$$

b) Find the rms value of the following sinusoidal waveform: $v = 140 \sin(377t + 60^\circ)$

c) Find the current i for the element in Fig shown below.



(GOOD LUCK)

(12 MARKS)