Code No : **20EE2T01**

R20

I B. TECH II SEMESTER REGULAR EXAMINATIONS, SEPTEMBER - 2021
BASIC CIRCUIT ANALYSIS
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time : 3 Hours **Max. Marks : 70**

Note : Answer **ONE** question from each unit **(5 × 14 = 70 Marks)**

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UNIT-I

1. a) Define KCL and KVL. Resistors of R1= 10Ω, R2 = 4Ω and R3 = 8Ω are connected to two batteries (of negligible resistance) as shown in Fig.1 Find the current through each resistor [7M]

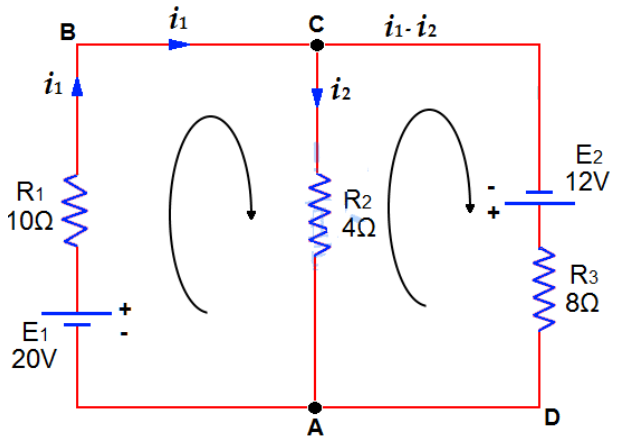
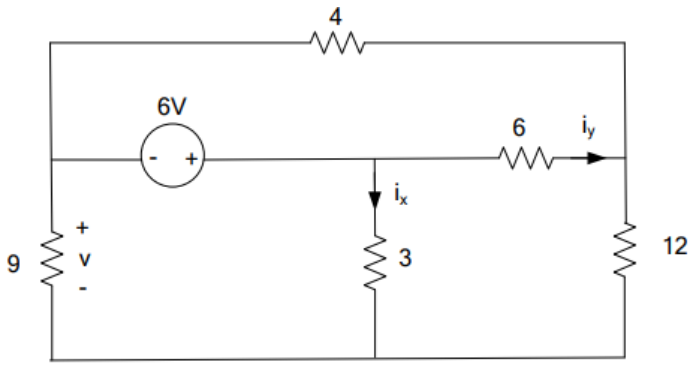


Fig.1

b) Write the mesh (loop) equations for the following circuit and then find i_x, i_y and v. [7M]



(OR)

2. a) Solve for the current flowing through the each resistor in Fig.2 [7M]

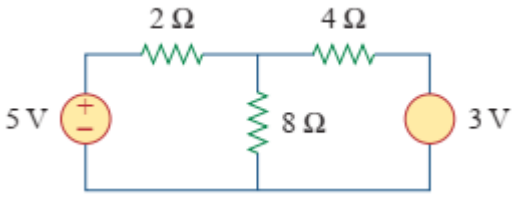


Fig.2
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b) Calculate equivalent resistance across terminals A and B in Fig.3 [7M]

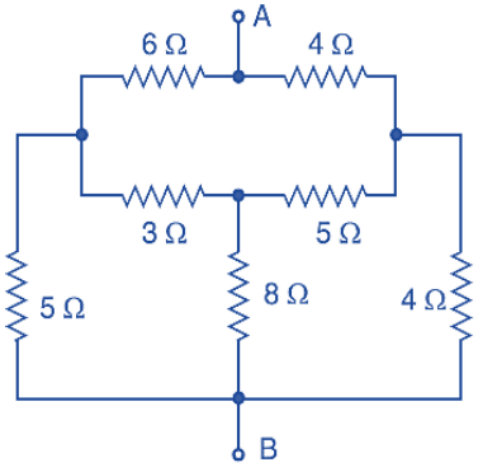

Fig.3

UNIT-II

3. a) Calculate the phase angle between V1=10cos(ωt+50) and V2=12sin(ωt-10). State which sinusoid is leading. [4M]

b) Explain concept of admittance? And explain parallel RL circuit across sinusoidal supply. [10M]

(OR)

4. a) Explain the following terms (i) Peak value (ii) Average value and (iii) RMS value [7M]

b) The current in a circuit lag the voltage by 30^0. If the input power be 400W and the supply voltage be V=100sin(370t). Find the complex power [7M]

UNIT-III

5. a) Find Io in Fig.4 using mesh analysis [7M]

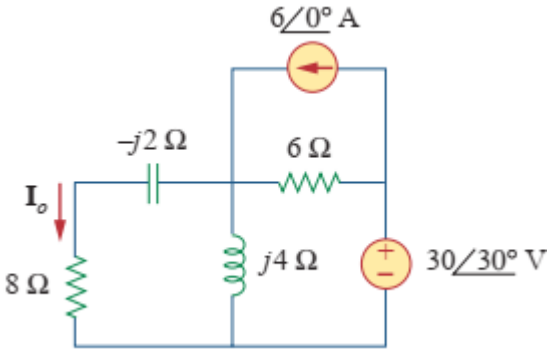

Fig.4

b) If a series of LCR circuit has same current at ω=100 rad/sec, and ω=900 rad/sec, then find resonance frequency in Hz of the circuit. [7M]

(OR)

6. a) Define Resonance also derive the condition for resonance in a series RLC circuit. [7M]

b) Write a short notes on (i) Selectivity (ii) Bandwidth. [7M]

UNIT-IV

7. a) Find the Thevenin's equivalent circuit across the terminals ab shown in Fig.5 [7M]

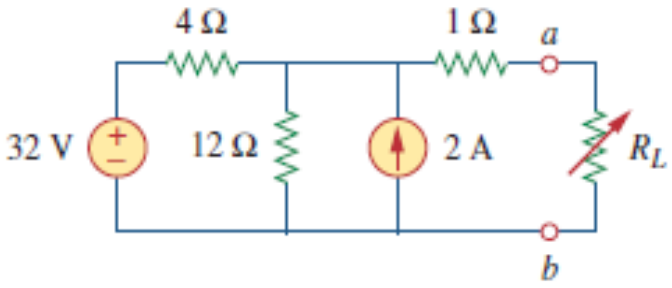

Fig.5

b) Verify the Reciprocity theorem in the circuit shown in Fig.6 [7M]

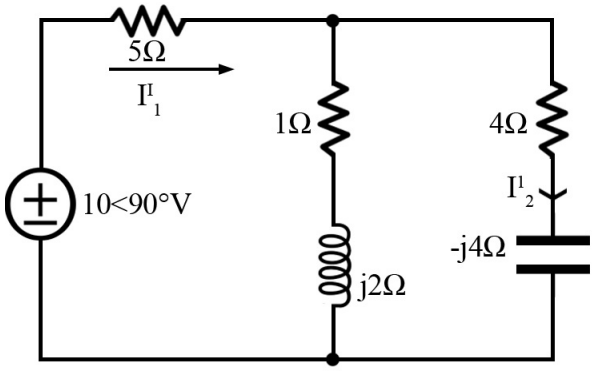

Fig.6

(OR)

8. a) Find the current through 10 Ω resistance in the given network shown in Fig. 7 by using Superposition theorem [7M]

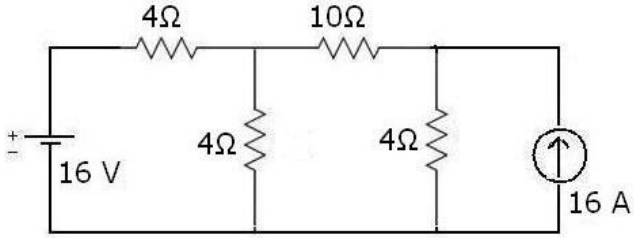

Fig. 7

b) Find the current and voltage across the load terminal shown in Fig. 8 using Millman's theorem [7M]

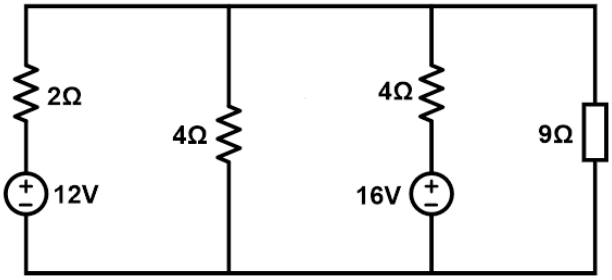

Fig.8

UNIT-V

9. a) Show that in a series magnetic circuit total reluctance equals to sum of individual reluctances. [7M]

   b) Calculate the phasor currents I_1 and I_2 in the circuit of Fig.9. [7M]

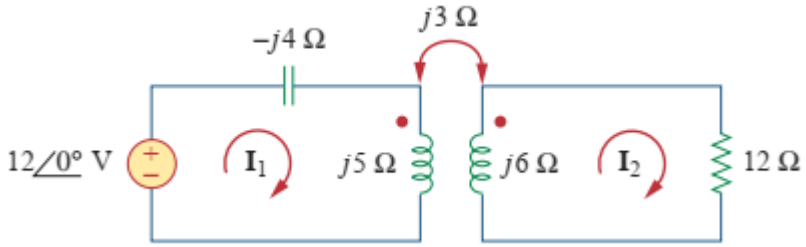

Fig.9

(OR)

10. a) Explain the following terms (i) Magnetic Field, (ii) Magnetic Flux, (iii) Magnetic Flux Density [7M]

    b) Determine the M.M.F. required to generate a total flux of 100μWb in an air gap 0.2 cm long. The cross-sectional area of the air gap is 25 cm^2. [7M]

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