CODE No.: 16BT10201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations December - 2018

ELECTRICAL CIRCUITS

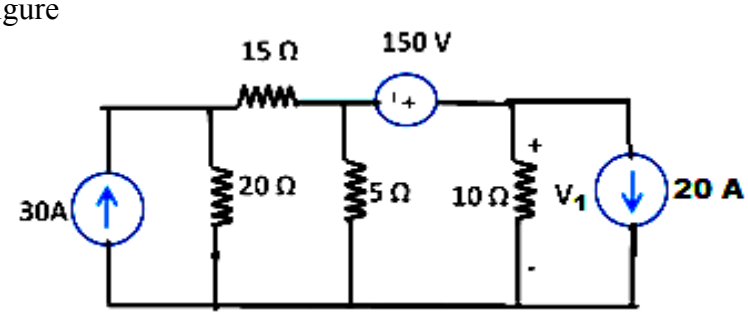
[Electrical and Electronics Engineering]

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

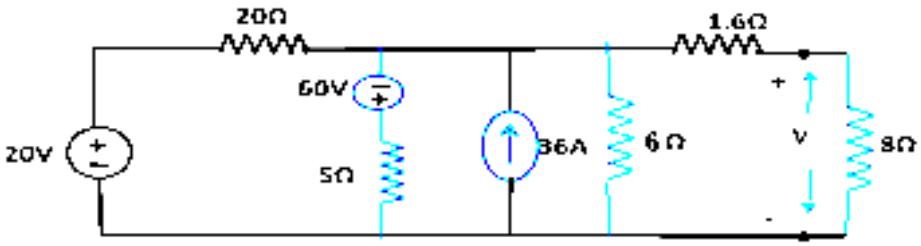
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Compute the voltage across 10Ω resistor V_1, using nodal analysis for the circuit shown in figure 7 Marks

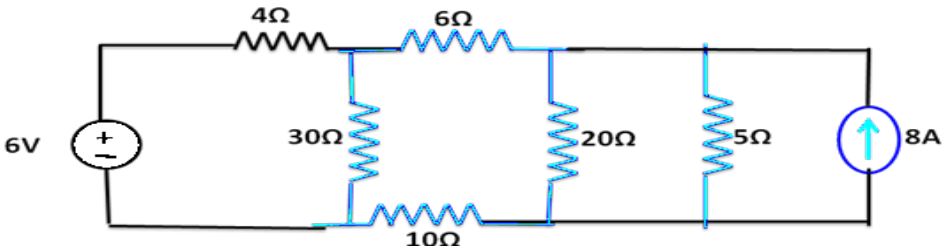


b) Use a series of source transformations to find the voltage V in the circuit shown in figure. 7 Marks

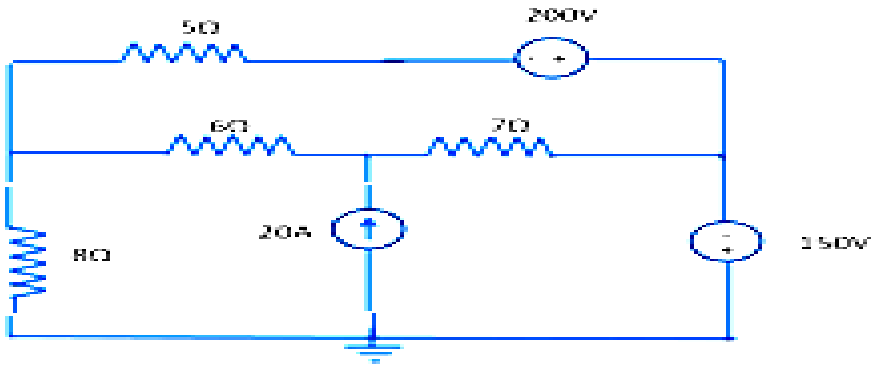


(OR)

2 a) For the circuit shown in figure, use a series of source transformations to find the power associated with 6V source. 7 Marks



b) Compute the voltage across the 7Ω resistor, using mesh analysis for the circuit shown in figure 7 Marks



UNIT-II

3 a) An RLC series circuit has R = 4Ω and L = 25mH. 7 Marks

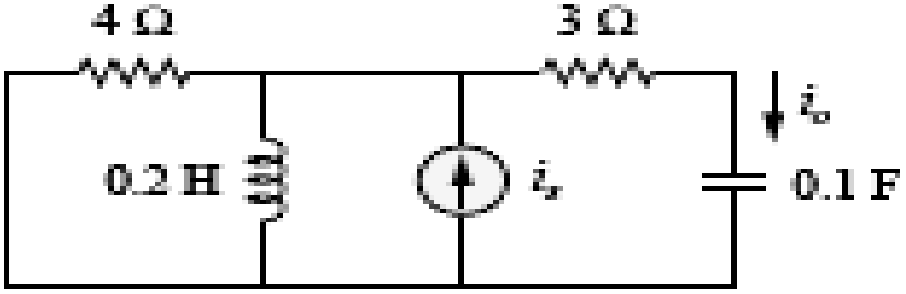
i) Calculate the value of *C* that will produce a quality factor of 50.

ii) Find ω_1 and ω_2.

iii) Determine the average power dissipated at $\omega = \omega_0, \omega_1, \omega_2$.

Take V_m = 100 V.

b) If i_s = 20 sin (10t+15^0) A in the circuit shown in figure, compute the current passing through capacitor i_0. 7 Marks



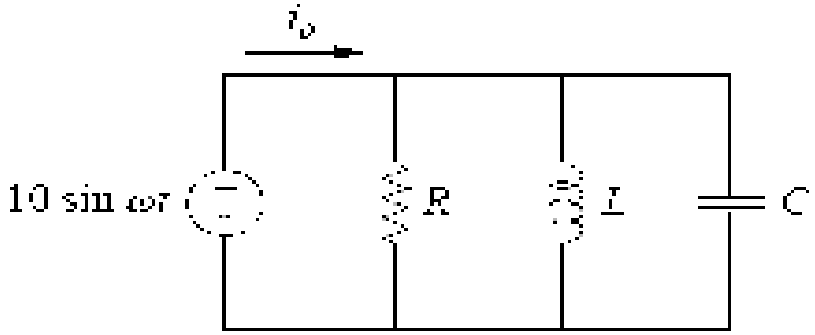
(OR)

4 a) In the parallel RLC circuit of figure, let R = 8kΩ, L = 0.2mH and C = 8μF. 7 Marks

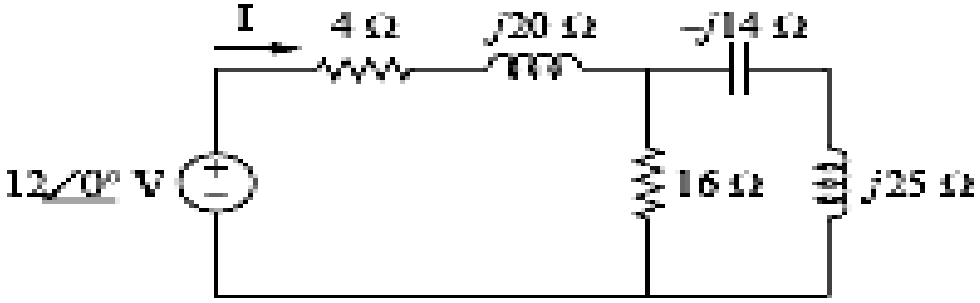
i) Calculate ω_0, Q and Band width.

ii) Find ω_1 and ω_2

iii) Determine the power dissipated at ω_0, ω_1 and ω_2.



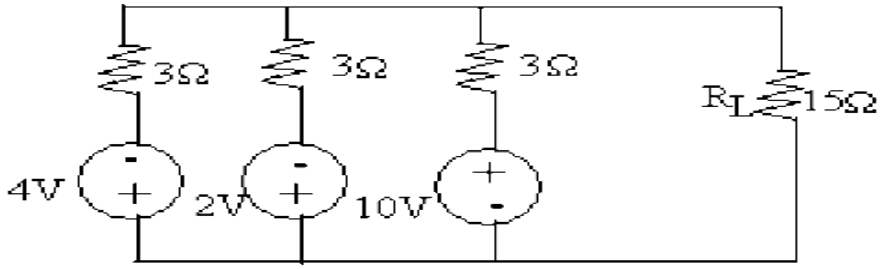
b) Compute the circuit impedance and current in all the elements of circuit shown in figure. 7 Marks



UNIT-III

5 a) State and explain Millman's theorem. 7 Marks

b) Find the current through load resistance R_L and also find the voltage drop across load using Millman's theorem as shown in figure. 7 Marks

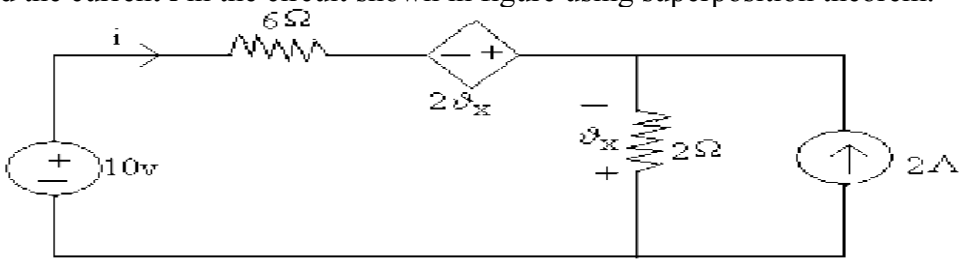


(OR)

6 a) State and explain maximum power transfer theorem and derive the necessary 6 Marks

conditions for maximum power transfer for a DC excitations.

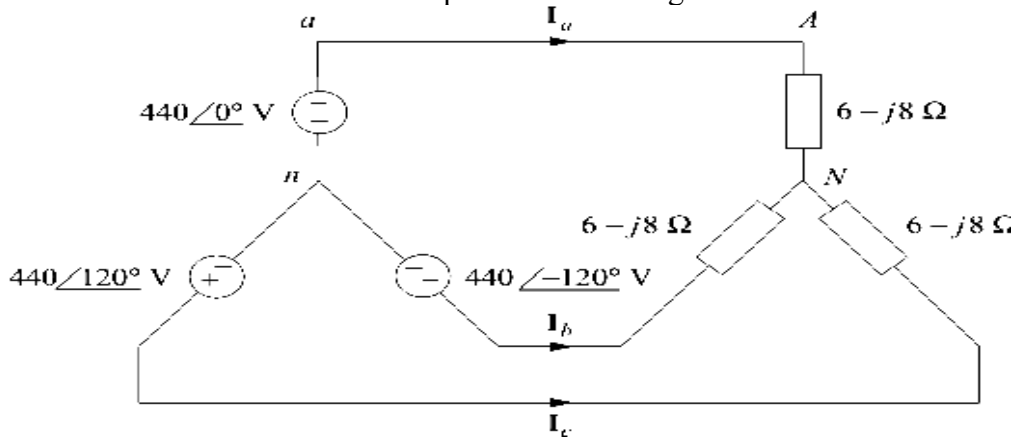
b) Find the current **i** in the circuit shown in figure using superposition theorem. 8 Marks



UNIT-IV

7 a) Derive the relation between line and phase voltages of **wye** connected polyphase system. 6 Marks

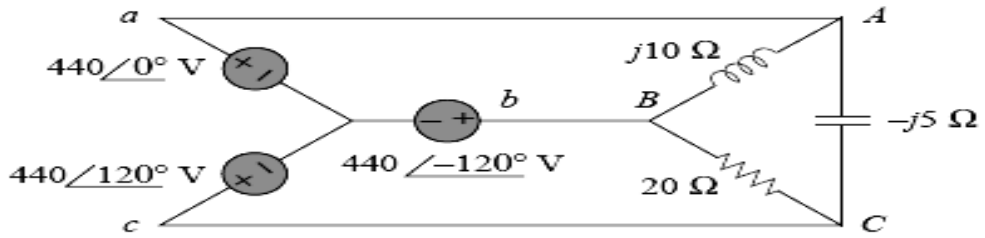
b) Obtain the line currents in the three-phase circuit of figure. 8 Marks



(OR)

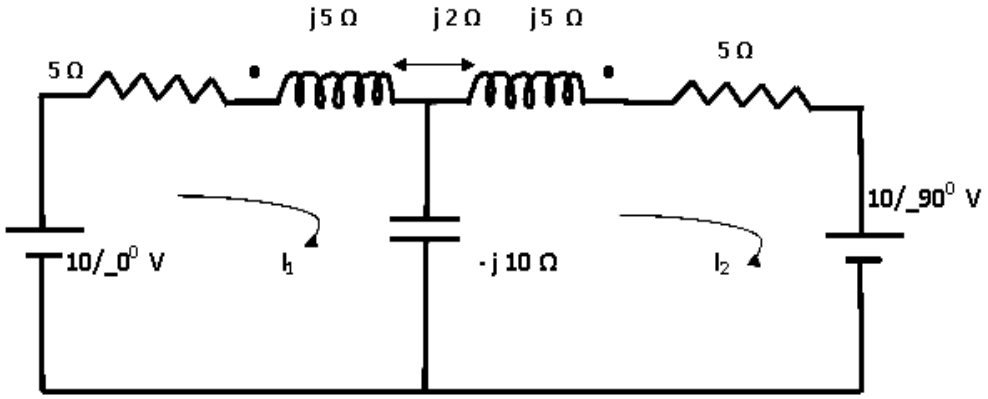
8 a) Derive the relationship between line and phase quantities (both voltages and currents) in balanced ∇-∇ polyphase systems with the phasor diagram. 7 Marks

b) Refer to the unbalanced circuit shown in figure, calculate: (i) the line currents (ii) the real power, reactive power and apparent power absorbed by the load. 7 Marks

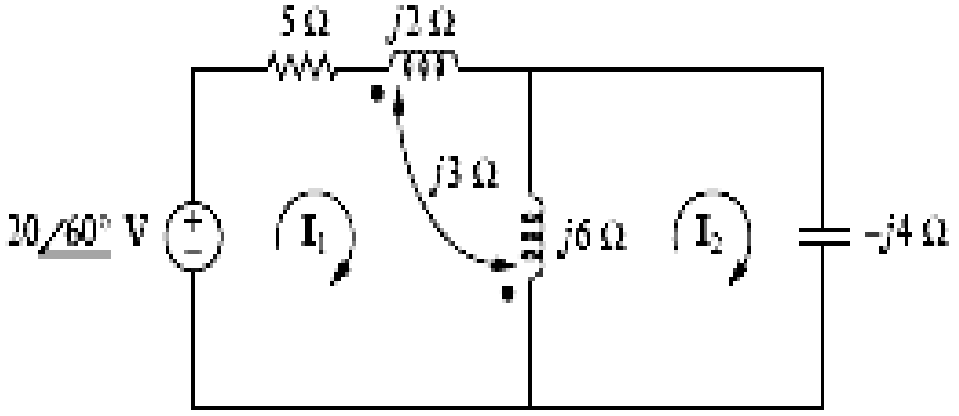


UNIT-V

9 a) For the circuit shown in figure, find the loop currents for the coupled circuits. 7 Marks

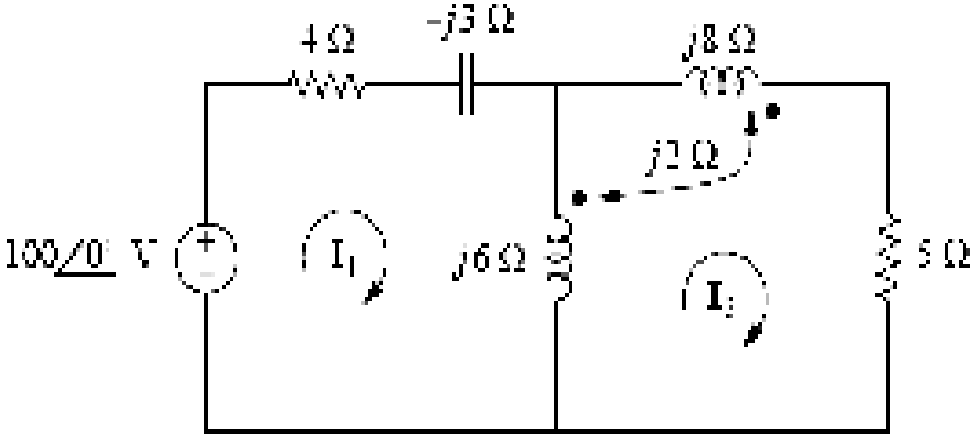


b) Determine the phasor currents I_1 and I_2 in the circuit of the figure . 7 Marks

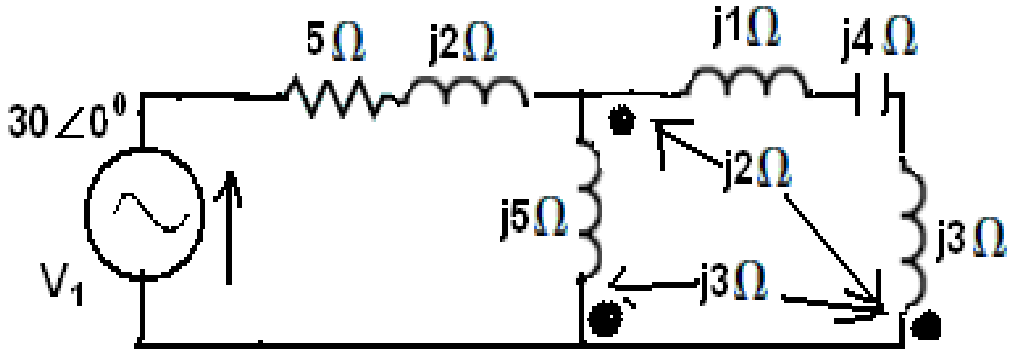


(OR)

10 a) Compute the mesh currents shown in figure and also find the voltage across j8Ω inductor. 7 Marks



b) Write the mesh equations for the network shown in figure and determine the current through 5Ω resistor. 7 Marks



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