**Subject Code: R13211/R13** **Set No - 1**

**I B. Tech II Semester Supplementary Examinations Dec - 2016**

**NETWORK ANALYSIS**

(Com. to ECE, EIE, E Com E)

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

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
**Three** Questions should be answered from **Part-B**

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## PART-A

1. (a) What is meant by Unilateral and bi-lateral element?
   (b) Explain how voltage source with a source resistance can be converted into an equivalent current source.
   (c) Distinguish between steady state and transient response.
   (d) Define mutual inductance and self inductance
   (e) State Maximum power transfer theorem.
   (f) Mention the Properties of a series RLC circuit.
   (g) Define time constant of RC circuit.

[3+3+4+3+3+3+3]

## PART -B

2. (a) Draw the graph of the network given in Figure 1, find tie test schedule and determine loop currents.

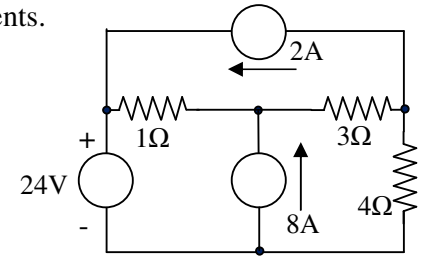


Figure 1

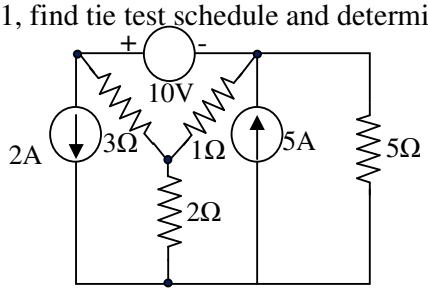


Figure 2

   (b) Find the power delivered by the 5A current source (in Figure 2) using nodal analysis. [8+8]

3. (a) Find $v_x$ in the network of Figure 3, if the current through 2 +$j$3 element is zero.

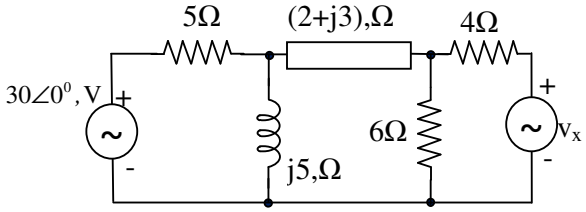


Figure 3

   (b) A sinusoidal voltage 25sin 10t is applied at time t=0 to a series R-L circuit having R=5Ω and L=1H Find i(t) and sketch it. Assume Zero current through the inductor before applying the voltage. [8+8]

4. (a) For the circuit shown in below Figure 4, find the value of ω so that current and source emf are in phase. Also find the current at this frequency.

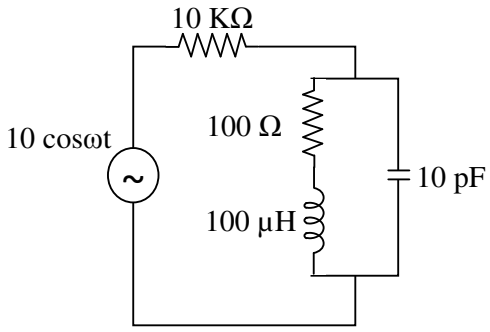


Figure 4

(b) Two identical coils with L=0.02H have a coefficient of coupling of 0.8. Find mutual inductance and the two equivalent inductances with the two coils connected in series aiding and series opposing. Derive the equations employed. [8+8]

5. (a) Compute the current in 23 ohm resistor using super position theorem for the circuit shown in Figure 5.

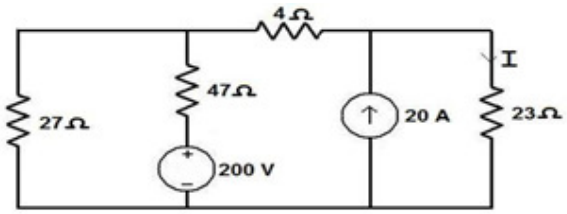


Figure.5

(b) Find the value of $R_L$ so that maximum power is delivered to the load resistance shown in below Figure 6. [8+8]

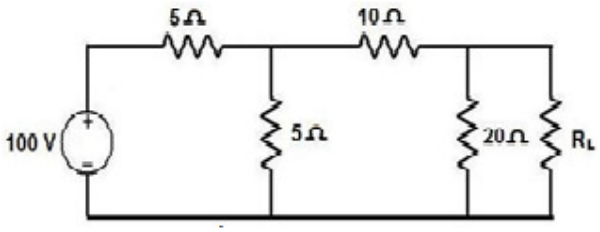


Figure.6

6. a) Given the ABCD parameters of a two-port network, determine its z-parameters. [8]
   b) Find the y-parameters for the network given in Figure.7 [8]

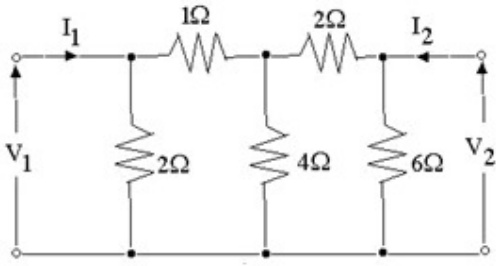


Figure.7

7. (a) The circuit (Figure 8) shown, the switch position changes from 1 to 2 at t=0. Determine the initial conditions i , di/dt , $d^2i/dt^2$ at $t=0^+$ [8]

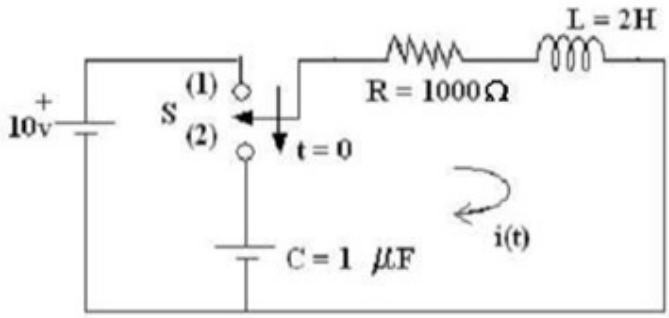


Figure.8

(b) For the circuit shown in figure.9, find the voltage across the resistor 0.5 ohm when the switch, S is opened at t=0. Assume that there is no charge on the capacitor and no current in the inductor before switching. [8]

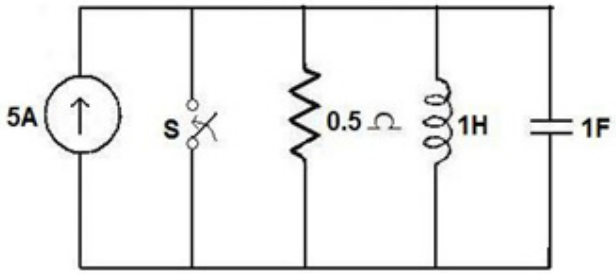


Figure.9