Reg. No. : ....

Name : ....

Third Semester B.Tech. Degree Examination, January 2015
(2008 Scheme)
08.303 : NETWORK ANALYSIS (TA)
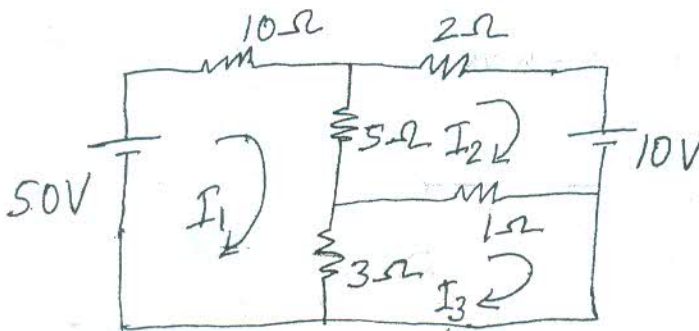
Time : 3 Hours   Max. Marks : 100

PART – A

Answer **all** questions.

1. Determine the mesh currents I_1, I_2 and I_3 in the following network.

2. Plot the following functions

   a) $u(t) + u(t+1)$

   b) $5u(t+2)$

   c) $3r(t-2)$

   d) $\delta(t-4)$

3. State reciprocity theorem and superposition theorem.

4. Define and prove maximum power transfer theorem.

5. Plot the poles and zeros of the function $e^{-\sigma t} \cos \omega t$.

6. The impedance parameters of a two port network are $Z_{11} = 6\ \Omega$, $Z_{22} = 4\Omega$, $Z_{12} = Z_{21} = 3\Omega$, calculate Y-parameters.

7. Obtain the transfer function of a first order RC low pass circuit.

8. Prove that in a series RLC resonant circuit the resonant frequency is the geometric mean of half power frequencies.

9. What are the characteristics of Bessel-Thomson response ?

10. What is the significance of frequency transformation in analog filter design ?
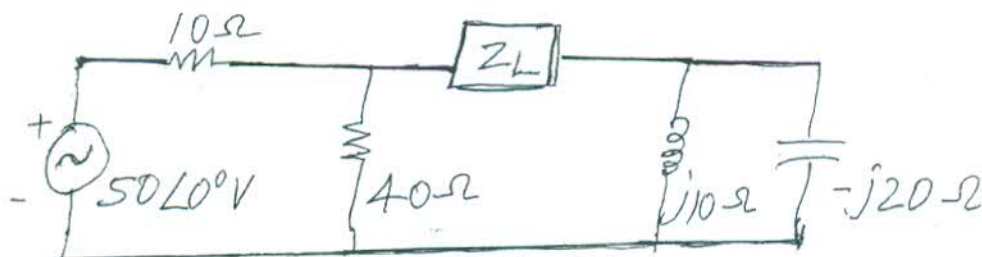
(10×4=40 Marks)

PART – B

Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

Module – I

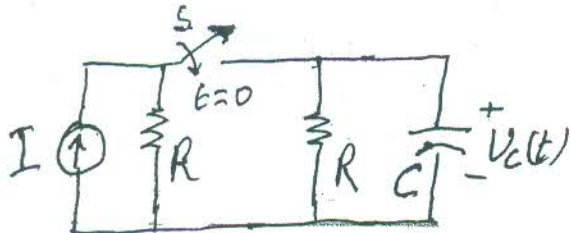11. Calculate the current i_o in the following network.
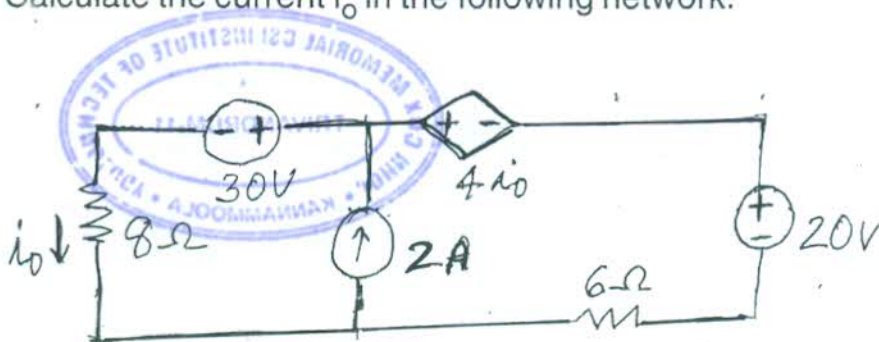
12. a) Determine the load impedance Z_L so that power absorbed by it is maximum and the value of power absorbed.

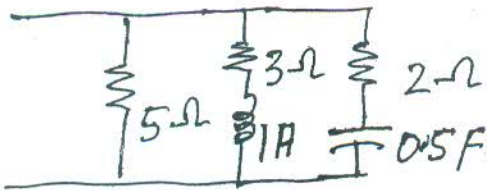b) Give the standard test signals and its Laplace Transforms used in network analysis.

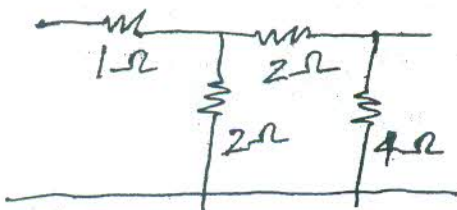13. In the network, switch 'S' is closed at t = 0. Find an expression for the voltage across the capacitor V_c (t).

Module – II

14. a) Explain the concept of complex frequency.

    b) Determine the driving point admittance of the network.
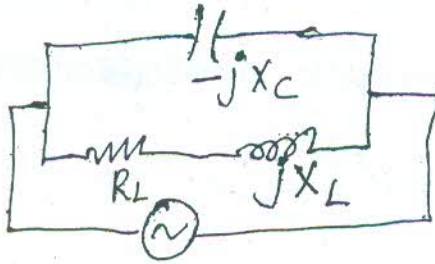

15. Find the Y-parameters of the network.

16. Draw the Bode plot for $G(s) = \dfrac{20}{s(s+2)(s+10)}$. From the Bode plot, determine

    a) Phase-cross over frequency

    b) Gain-cross over frequency

    c) Gain margin and

    d) Phase margin.

Module – III

17. a) Define Q factor and selectivity of a resonant circuit.

    b) Find the resonant frequency of the following tank circuit.

18. Compute the output voltage of the given coupled circuit.

19. a) Compare and contrast the Butterworth and Chebyshev filter characteristics.

    b) Draw the pole location of a Chebyshev filter (4th order).

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