(Pages : 4) **6512**

Reg. No. : .....

Name : .....

# Third Semester B.Tech. Degree Examination, November 2013
## (2008 Scheme)
## 08.303 : NETWORK ANALYSIS (TA)

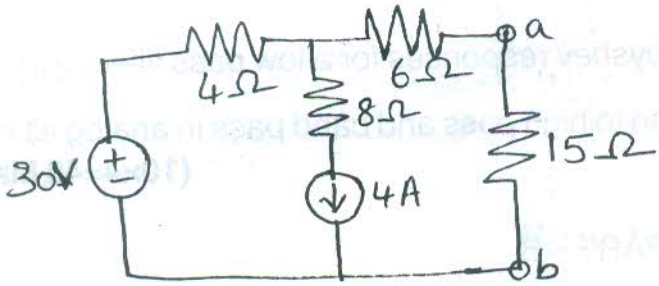
Time : 3 Hours Max. Marks : 100



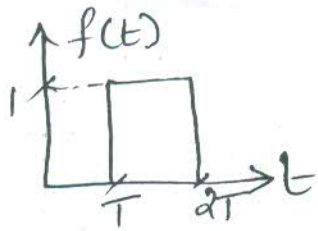
PART – A

Answer **all** questions.

1. Find the Norton's equivalent circuit across terminals ab for the circuit shown below.



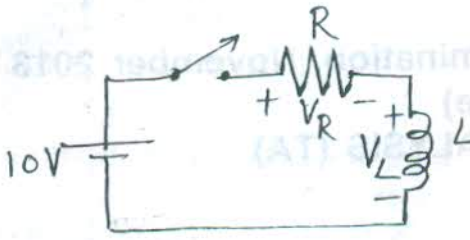

2. Obtain the expression for the given function, f(t) in terms of unit step function




3. State and prove initial value theorem.

P.T.O.

4. For the series RL circuit shown below, a constant voltage is applied at t = 0. At what time does $V_R = V_L$.



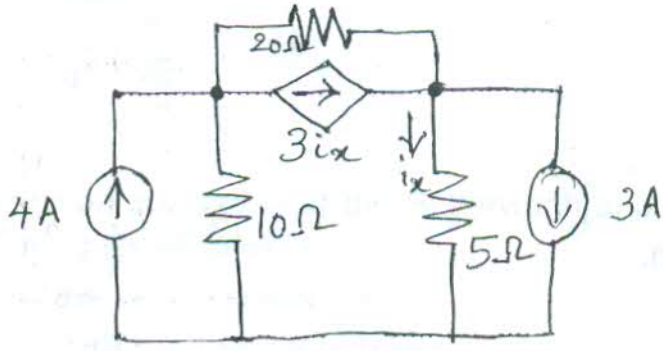

5. Derive the expressions for Z-parameters of a two port network in terms of Y-parameters.
6. Design a symmetrical T-type attenuator with characteristic impedance, $R_o$ and attenuation, N.
7. What are Bode plots ? Define Gain margin and phase margin.
8. Determine the quality factor of a coil for the series circuit consisting of $R = 10\,\Omega, L = 0.1H$ and $C = 10\,\mu F$.
9. Compare the Butterworth and Chebyshev responses for a low pass filter.
10. Explain the frequency transformation to high pass and band pass in analog filter design. **(10×4=40 Marks)**

PART – B

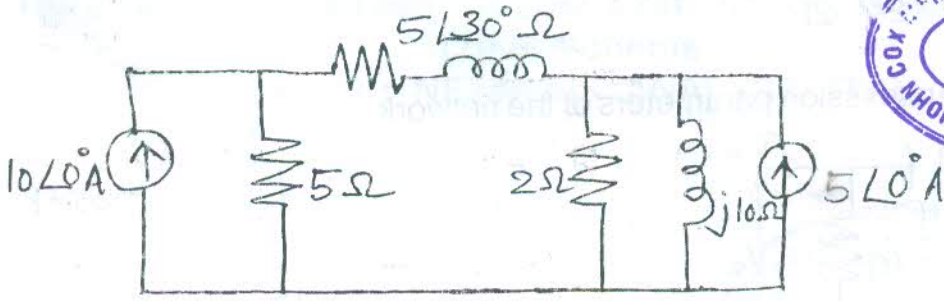
Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

**Module – I**

11. Using node analysis, determine $i_x$.

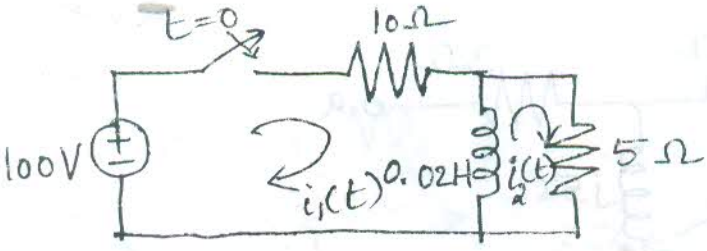


12. In the circuit shown below, determine the voltage across 2Ω resistor using superposition theorem.





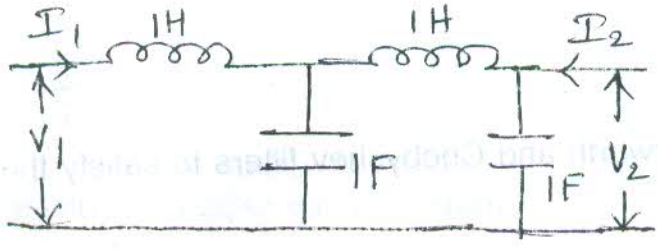

13. In the circuit shown, find the current $i_1(t)$ and $i_2(t)$ which results when the switch is closed at t = 0.




## Module – II

14. a) What are the necessary conditions for the network function to be a driving point function ? 4

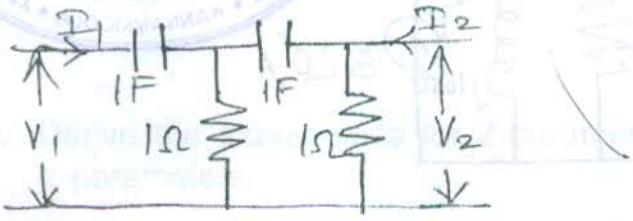
    b) For the given network, find the driving point impedance, $Z_{11}(s)$ and voltage transfer ratio, $G_{12}(s)$. 6



15. Draw the pole-zero diagram and hence obtain the time domain response, V(t) from the pole-zero plot for the network function

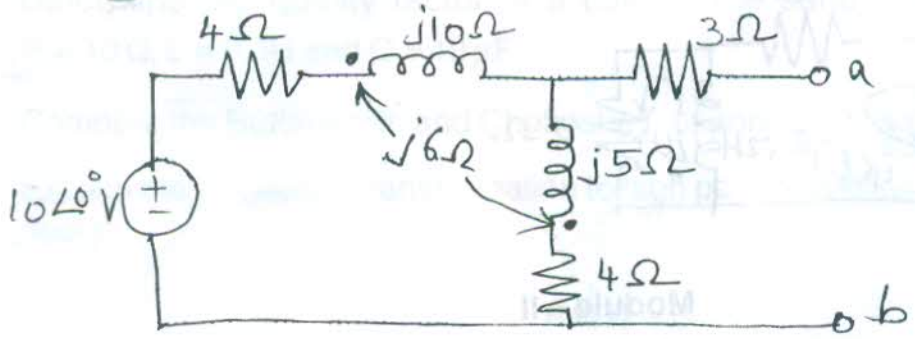
$$V(s) = \frac{5s}{(s+3)(s^2+2s+2)}.$$

16. Determine the transmission parameters of the network

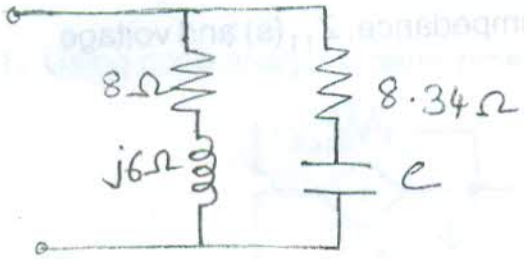



## Module – III

17. Obtain Thevenin's equivalent circuit at terminal ab for the coupled circuit shown below




18. For the circuit shown, find the value of capacitance, C so that the circuit resonates at a frequency of 5000 rad/sec.




19. Determine the orders of the Butterworth and Chebyshev filters to satisfy the following specifications.

$\alpha_P \le 1\text{dB}, \quad \omega \le 150\,\text{Krad/sec}$

$\alpha_S \ge 60\,\text{dB}, \quad \omega \ge 200\,\text{Krad/sec}.$

**(6×10=60 Marks)**