(Pages : 4)

F – 2209

Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, December 2018
(2008 Scheme)
08.303 : NETWORK ANALYSIS (TA)

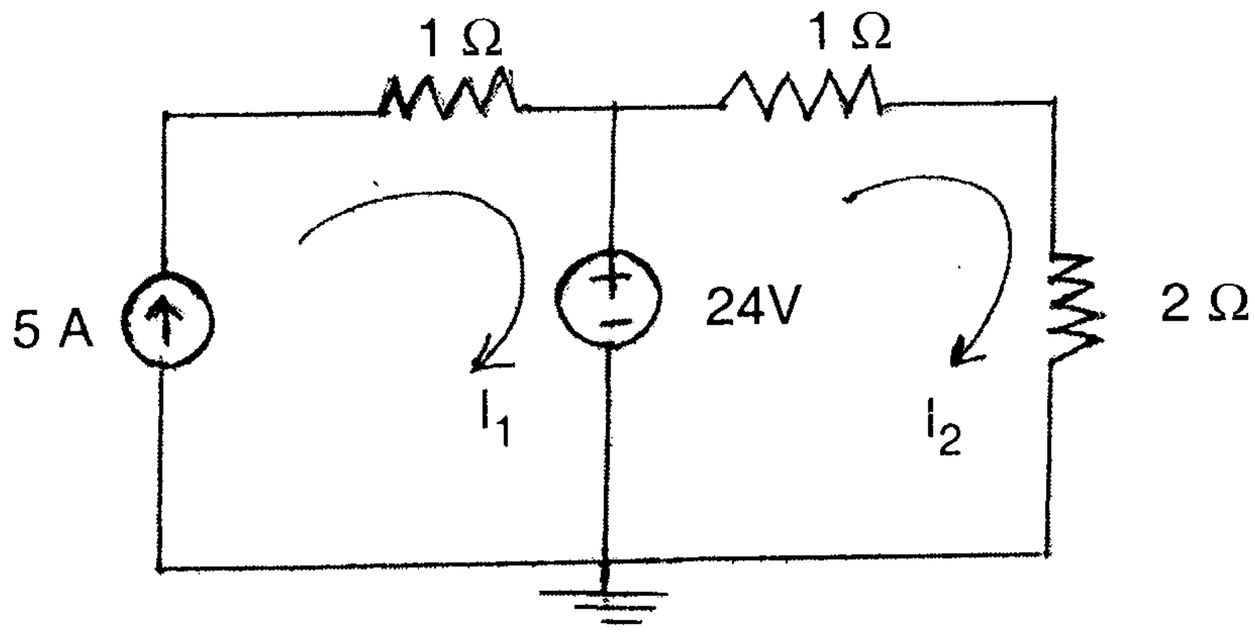
Time : 3 Hours

Max. Marks : 100

PART – A

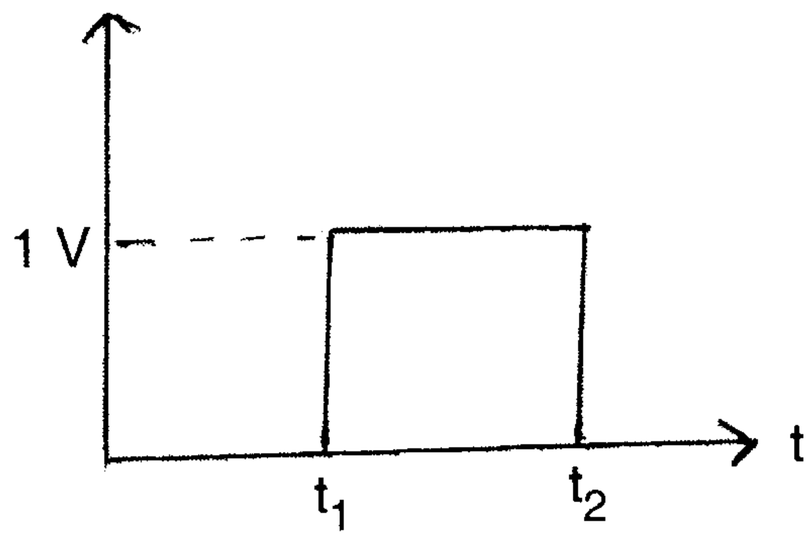
Answer **all** questions. **Each** question carries **4** marks.

1. Determine the mesh currents of the network by mesh analysis.



2. Explain maximum power transfer theorem. What is its relevance in networks ?

3. Write the expression for the waveform using shifted step function and evaluate its Laplace transform.



4. State the necessary conditions for driving point function.

P.T.O.

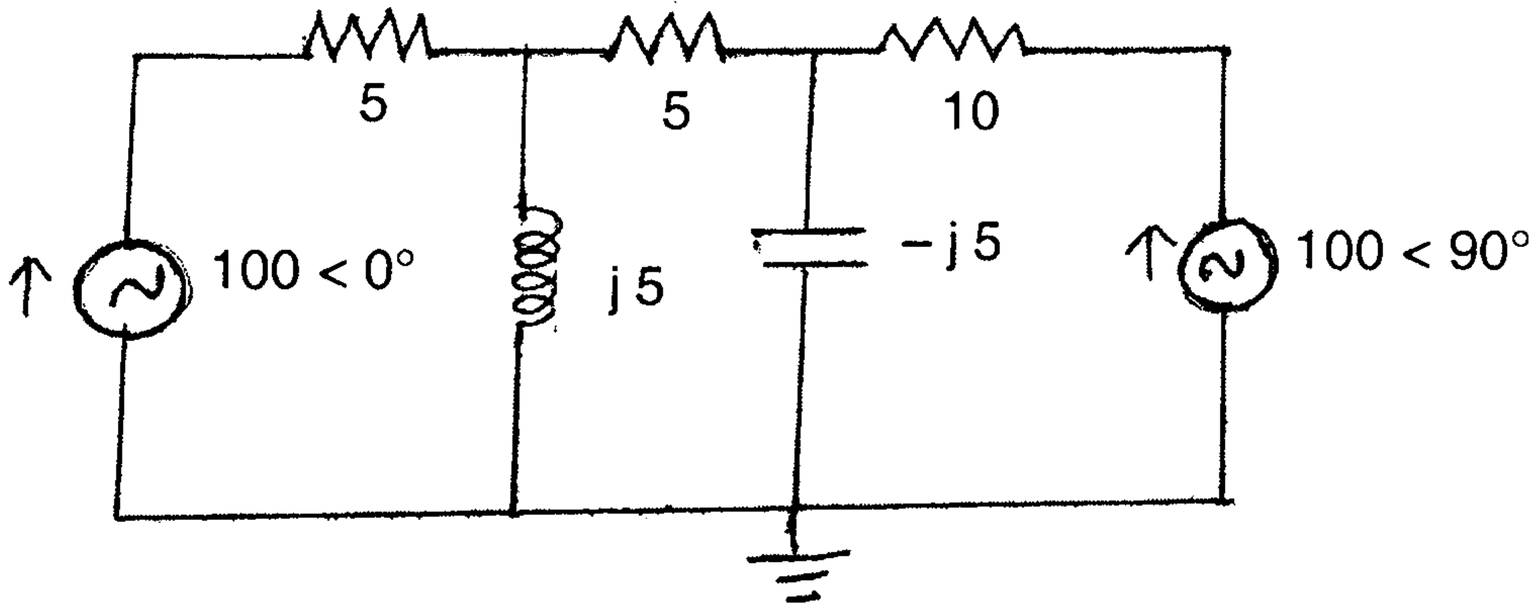
5. Define unit step, unit ramp and unit impulse functions. Give their significance in network analysis.
6. Design a symmetrical T-type attenuator with characteristic impedance Ro and attenuation N.
7. Explain the use of Bode plots. Explain gain margin and phase margin with relevant figures.
8. Show that the resonant frequency ω_0 of a RLC series circuit is the geometric mean of ω_1 and ω_2, the lower and upper half power frequencies respectively.
9. Explain the properties of Butterworth LPF. Any four relevant properties.
10. What is Bessel-Thomson Response ?

PART – B

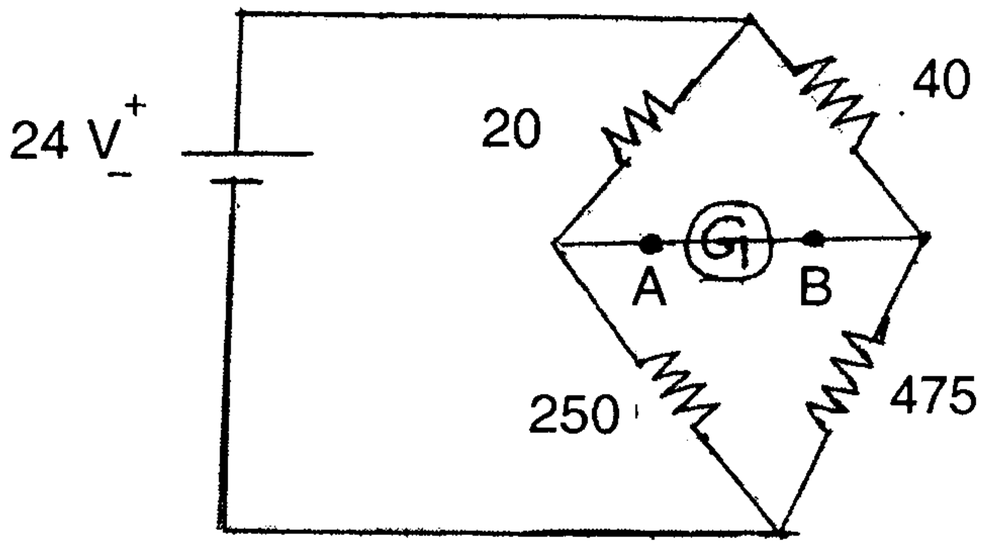
Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

Module – I

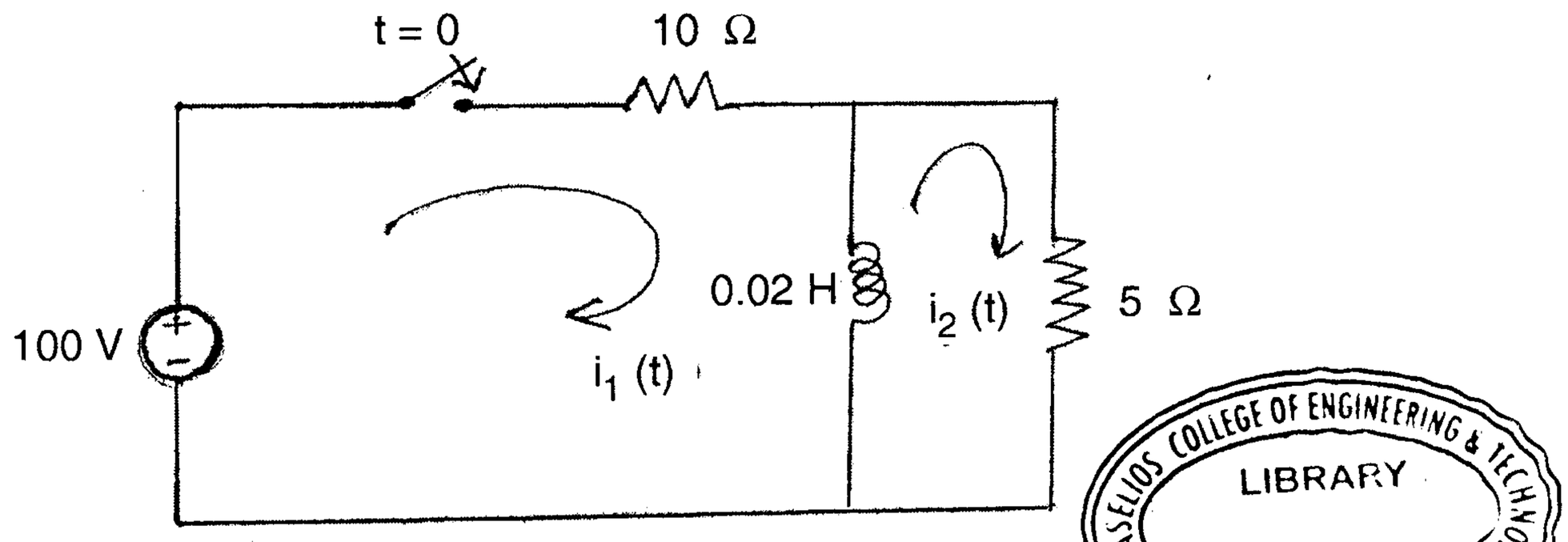
11. Write node voltage equations for the given network. Take earthed node as reference node. Find voltage across capacitor and the power of 100 < 90° source.



12. Obtain Norton's equivalent circuit for the bridge, across terminals AB. Hence find current through the galvanometer detector if its resistance is 11.1 Ω.



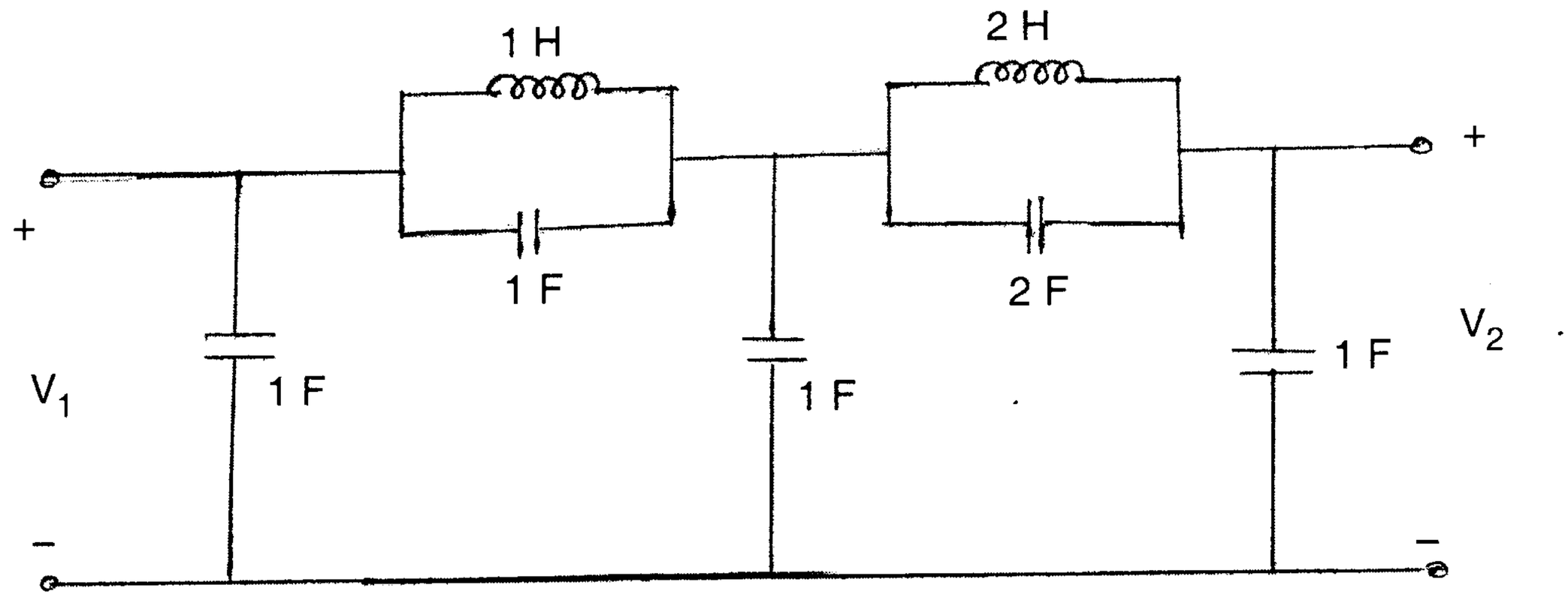
13. In the circuit shown, find the current $i_1(t)$ and $i_2(t)$ which results when the switch is closed at t = 0.



Module – II

14. Determine the characteristic impedance of a T-section which at a certain frequency has $z_1 = j\,600\ \Omega$ and $z_2 = -j\,350\ \Omega$. Then find the characteristic impedance of the π section.

15. For the network shown below, find the voltage transfer function $\frac{V_2(s)}{V_1(s)}$.

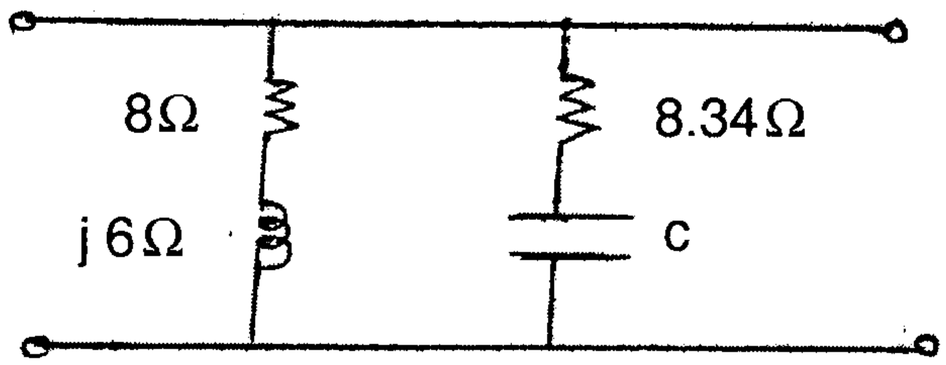


16. Draw the pole zero diagram and obtain the time domain analysis v(t) for the network function $V(s) = \frac{5s}{(s+2)(s^2+2s+2)}$.

Module – III

17. Given the specification $\alpha p = 1$ dB, $\alpha s = 30$ dB, $\Omega p = 200$ rad/s, $\Omega s = 600$ rad/s. Determine the order of the Butterworth filter.

18. Find the value of capacitance C so that the circuit resonates at a frequency of 5000 rad/s.



19. Explain the steps to design a 3rd order low pass Butterworth filter.