Reg. No. : .....

Name : .....

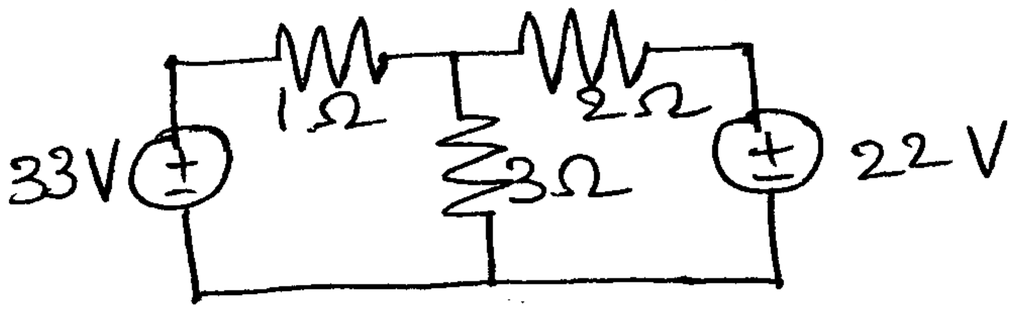
Third Semester B.Tech. Degree Examination, September 2016
(2008 Scheme)
08.303 : NETWORK ANALYSIS (TA)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions :

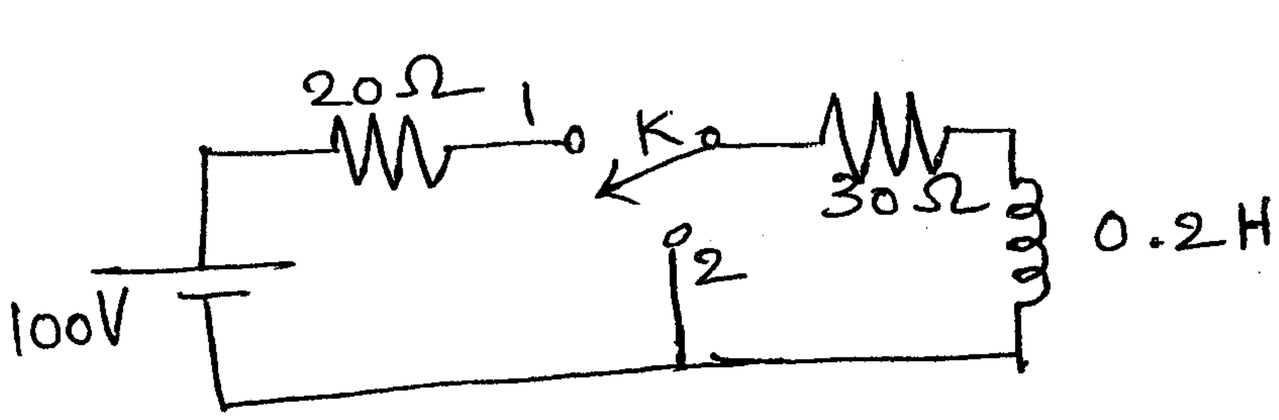
1. Find the current flowing through 3Ω resistor in the network using Millman's theorem.



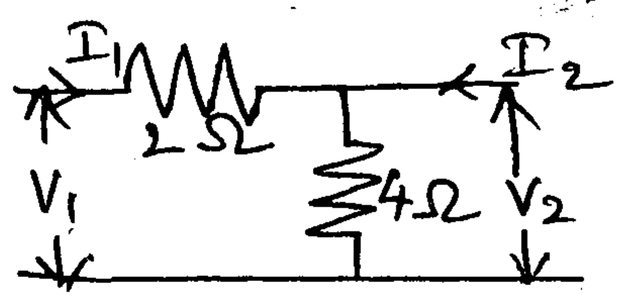
2. Plot the following functions :
   i) $u(t-5) + u(t-2)$
   ii) $2u(t) - u(t-3)$
   iii) $4r(t-2)$
   iv) $s(t-4)$

3. Verify the initial value and final value theorem for $f(t) = 5e^{-3t}\cos 5t$.

4. For the circuit shown, find the current equation for $t > 0$, when the switch k is moved from position 1 to 2 at $t = 0$. Assume that the circuit is in steady state before $t = 0$.



5. Find the transmission parameters of the network



6. Distinguish between image impedance and characteristic impedance.

7. Obtain the Nyquist plot of the transfer function, $G(j\omega) = \frac{1}{1+ j\omega T}$ is a semicircle when the frequency, ω is varied from 0 to infinity.

8. A series RLC circuit consists of $R = 50\Omega$, $L = 0.2H$ and $C = 10\mu F$ and an applied voltage of 20V. Determine the resonant frequency, Q-factor and bandwidth of the circuit.

9. Show that in a series RLC circuit, $f_O = f_L . f_H$, where f_L, f_H are half-power frequencies and f_O is the resonant frequency.

10. Explain the significance of frequency transformation in analog filter design.

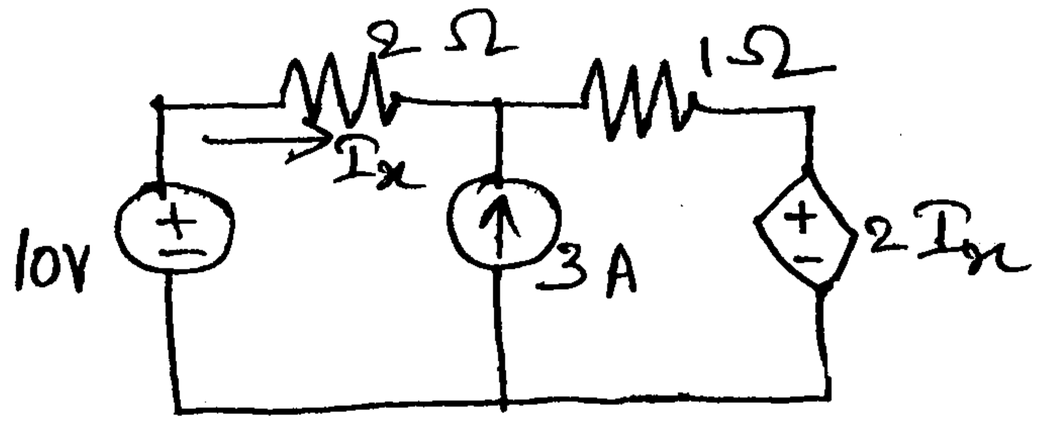
(10×4=40 Marks)

PART – B

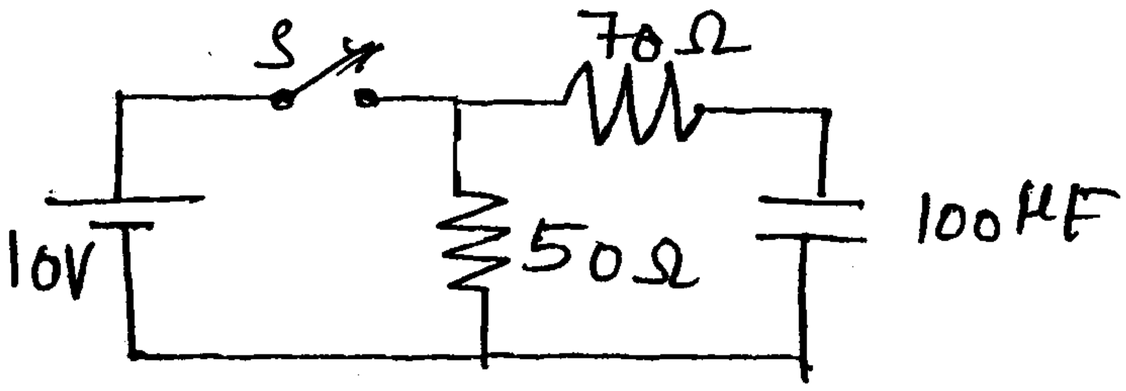
Answer **any two** questions from **each** Module. **Each** question carries **10** marks :

Module – I

11. Find the current I_x using Thevenin's theorem.

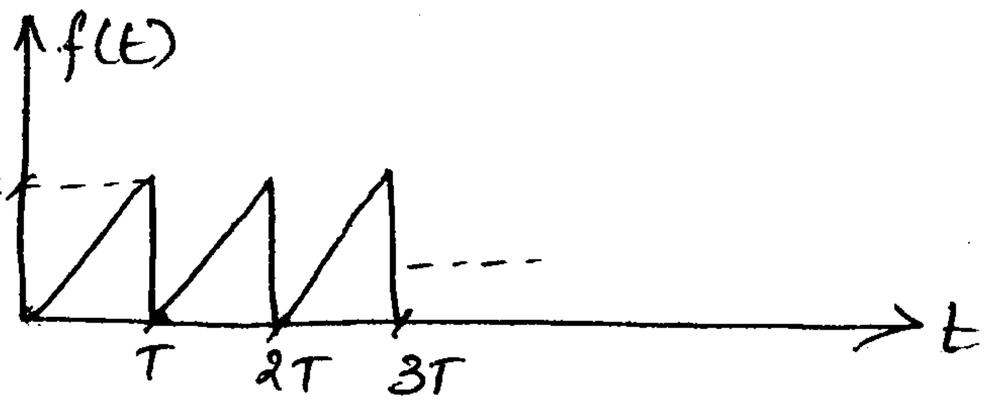


12. In the circuit shown, the switch S is closed at t = 0. Find the time when the current from the battery reaches 500 mA.

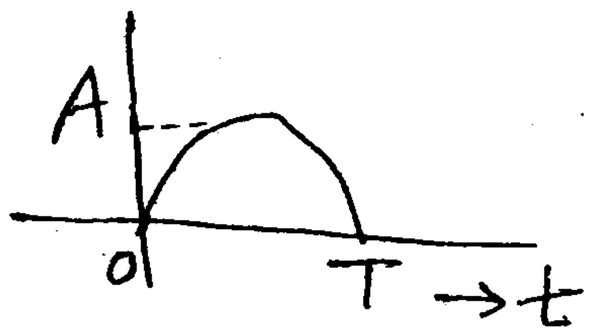


13. Find the Laplace transform of the given waveforms.

a)

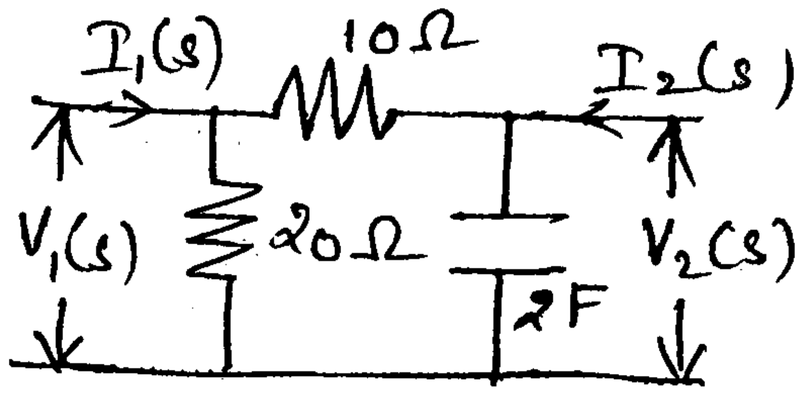


b)



Module – II

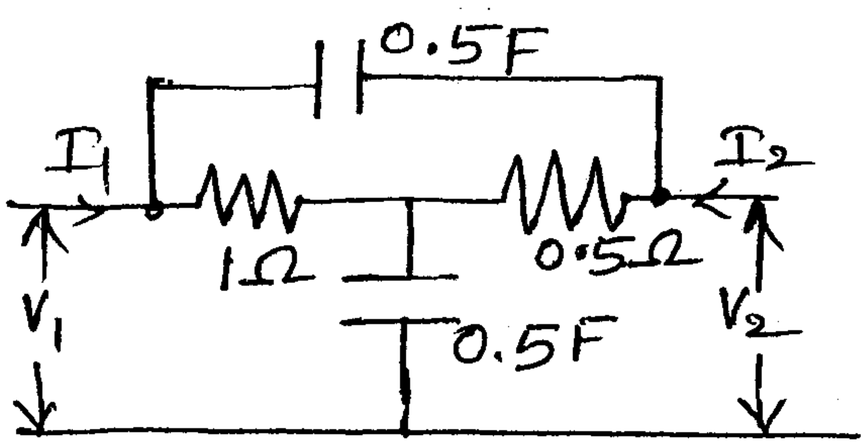
14. For the network shown, find the driving point impedance, $Z_{11}(s)$, transfer impedance, $Z_{21}(s)$ and voltage transfer ratio, $G_{21}(s)$.



15. Draw the Bode plot for the transfer function, $G(s) = \frac{4}{s(1+0.5s)(1+0.08s)}$, From the Bode plot, determine

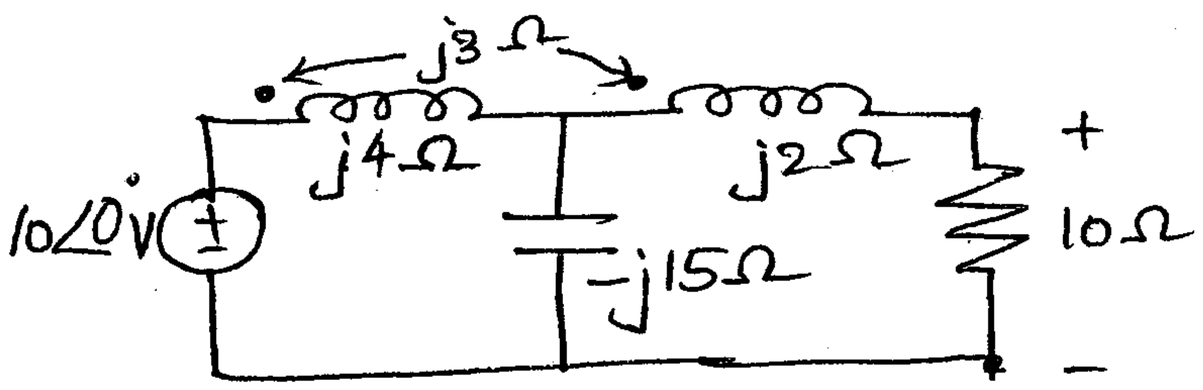
1) Phase-cross over frequency
2) Gain cross over frequency
3) Gain margin
4) Phase margin.

16. Determine the admittance parameters of the network.

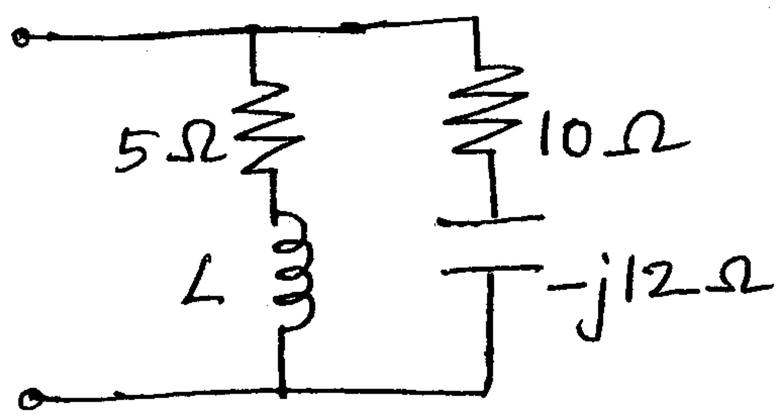


Module – III

17. Find the voltage across the 10Ω resistor of the coupled circuit shown below :



18. Find the value of L at which the circuit resonates at a frequency of 1000 rad/sec.



19. Find the order and cut-off frequency of a Butterworth to meet the following specifications.

Pass band gain = – 1dB

Pass band = 0 to 1.75 MHz

Stop band loss = atleast 20 dB at 2.5 MHz. **(6×10=60 Marks)**