QUESTION BANK

(B.E. SEM III EC ATKT EXAM)

GUJARAT UNIVERSITY

Network Analysis

Each Question of 10 Marks

Q.1. Which are the types of energy sources? Explain it.

Q.2. Define the following terms:

(1) Linearity (2) Reciprocity (3) Time Invariance (4) Passivity (5) Lumped network (6)Active network (7) Unilateral network (8) Bilateral network (9) Distributed network (10) Time Variance

Q.3. Determine current through the 4Ω resistor branch of the given network of figure (1).

Q.4. Determine the mesh current I1, I2, I3 in the network of figure (2)

Q.5. Determine the voltages of nodes 1 and 2 in the network of figure (3)

Q.6. Write down source transformation theorem and explain it

Q.7. Determine numerical value of I2 using source transformation method in figure (4).

Q.8. Determine current I using source transformation method in figure (5).

Q.9. Solve the nodal voltage V1, V2, V3 and V4 as shown in figure (6) using nodal analysis.

Q.10. Write down superposition theorem and explain it with an example

Q.11. Write down Thevenin's theorem and explain it with an example

Q.12. Write down Norton's theorem and explain it with an example

Q.13. Write down Reciprocity theorem and explain it with an example

Q.14. Derive the expression for maximum power transfer theorem for the following condition: (1) Source and load are resistive (2) Source is complex impedance and load is complex impedance with variable resistance and reactance

Q.15. Derive the expression for maximum power transfer theorem for the following condition: (1) Source is complex impedance and load is variable resistance (2) Source is complex impedance and load is variable reactance

Q.16. Find the current in 10 Ω resistor in the network of figure (7) using thevenin's theorem.

Q.17. Write down thevenin's equivalent across load resistance RL in figure (8).

Q.18. Determine the value of I1 using superposition theorem in figure (9).

Q.19. In the network of figure (10) the switch k is closed at t = 0 with the capacitor uncharged and with zero current in the Inductor. Find the values of i, di/dt and d^2i/dt^2 at t=0+.

Q.20. Determine step response to RC series circuit by using Laplace transformation

Q.21. Determine step response to RL series circuit by using Laplace transformation

Q.22. Define Laplase transformation and explain it to solve differential equations.

Q.23. Write down and prove Initial and final value theorem

Q.24. Determine the relationship between ABCD and Z parameters

Q.25. Determine the relationship between Y and g parameters

Q.26. Determine the relationship between h and ABCD parameters

Q.27. Determine Laplace transformation of following function

(a) sin wt (b) e^{-at} coswt

Q.28. Find the Inverse Laplace of the following function

(a) $1 / s (s^2 + 6s + 9)$ (b) $(s - 1) / (S^2 + 3S + 2)$

Q.29. What is significance of poles and zeros in Laplace transformation? Explain it.

Q.30. Determine voltage response to RC series circuit by using first order differential equation.

Q.31. Explain Shifting and Scaling theorem for unit step function.

Q.32. Explain Driving point function and write down necessary condition for driving point function.

Q.33. Short Note: (a) Bode plot (b) Nyquist's stability criteria

Q.34. In the network shown in figure (11), a steady state is reached with switch k open. At t = 0, the switch is closed. For the element values given, determine the value of Va(0-) and Va(0+)

Q.35. In series RL circuit can be excited by $V(t) = Vm \sin (wt+ \theta)$. Find out its complete transient as well as steady state response for current.

Q.36. In series RC circuit can be excited by $V(t) = Vm \sin (wt+ \theta)$. Find out its complete transient as well as steady state response for current.

Q.37. Derive the expression for transformation of derivatives and integrals using Laplase transformation

Q.38. Explain Partial fraction expansion and Heaviside's expansion theorem for laplase transform

Q.39. Explain phasor diagram for RL, RC and RLC circuits.

Q.40. Prove: Y parameter can be add in parallel-parallel connection of two port network

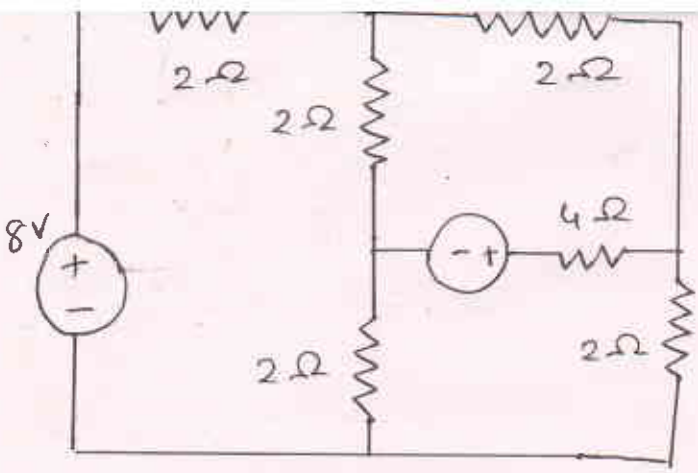


figure (1)

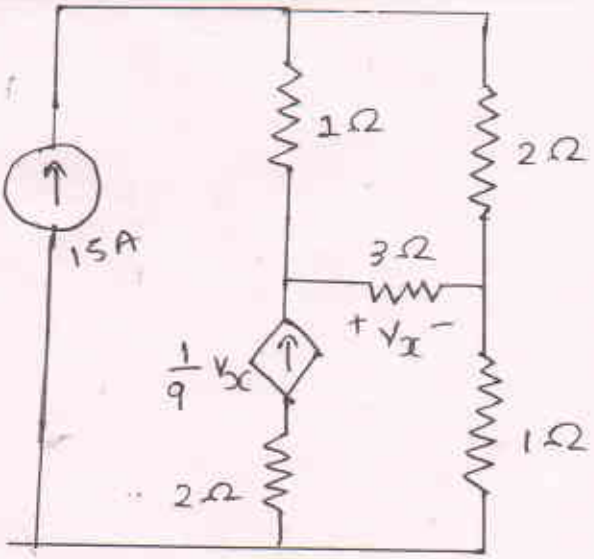
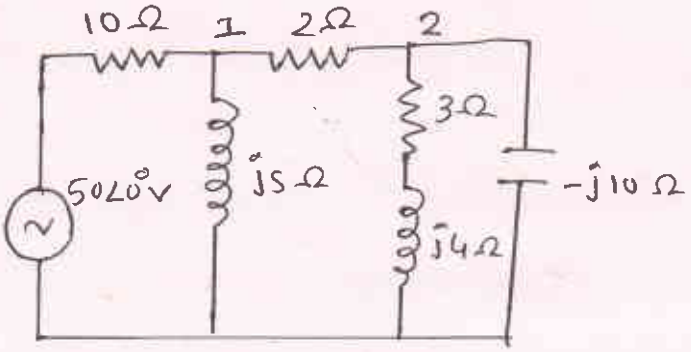


figure (2)



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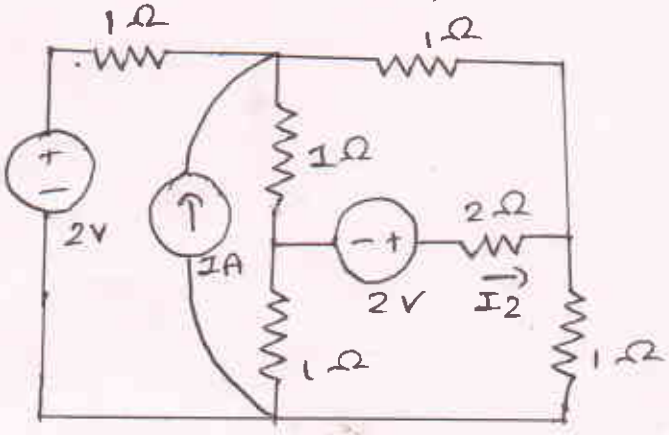

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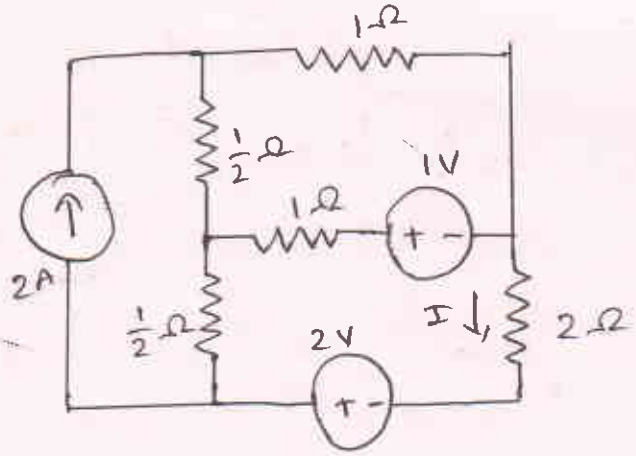

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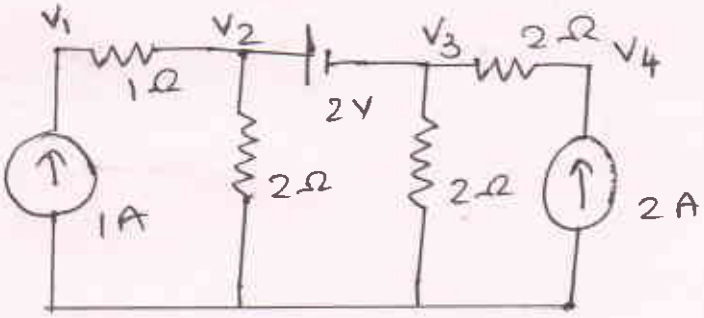
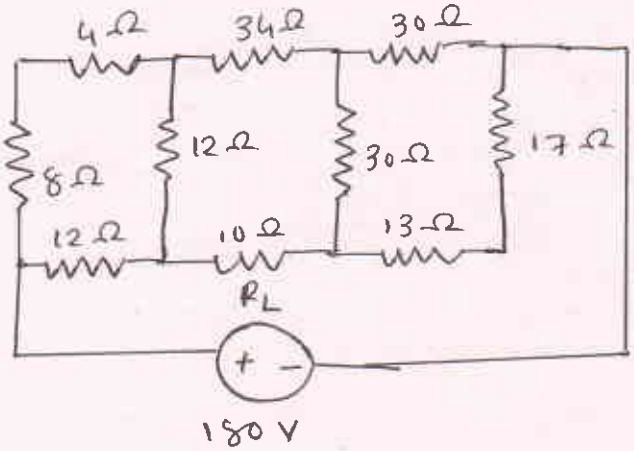


figure (6)



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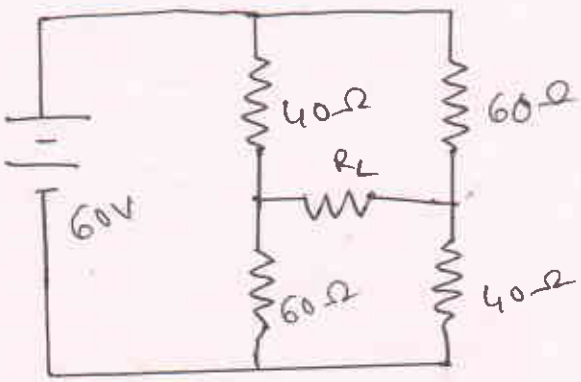

figure (8)

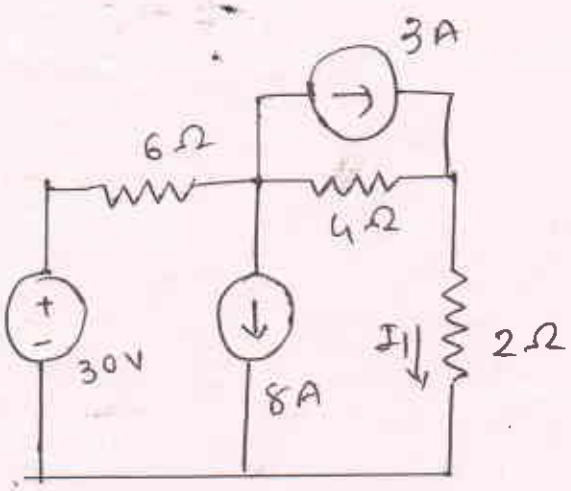

figure (9)

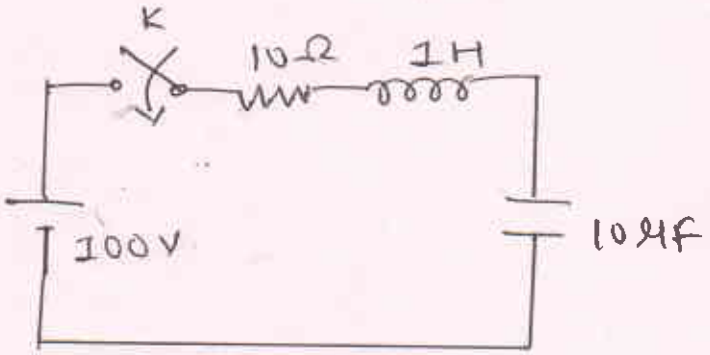

figure (10)

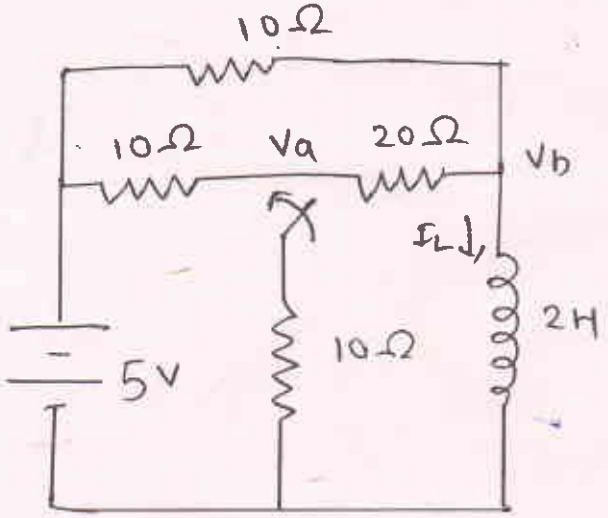

figure (11)