



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)

(Affiliated to Andhra University, Visakhapatnam)

B.Tech. - I Semester Regular Examinations, December / January – 2025

NETWORK THEORY AND MACHINES

(Electronics and Communication Engineering)

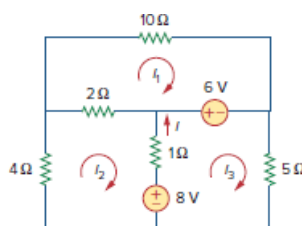
- All questions carry equal marks
- Must answer all parts of the question at one place

Time: 3Hrs.

Max Marks: 70

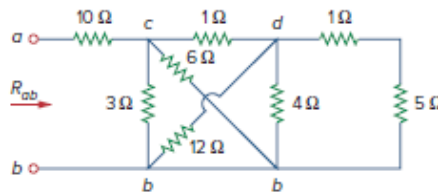
UNIT-I

- State and explain Kirchoff’s voltage and current law with an example. [7M]
 - Apply mesh analysis to find ‘i’ [7M]



(OR)

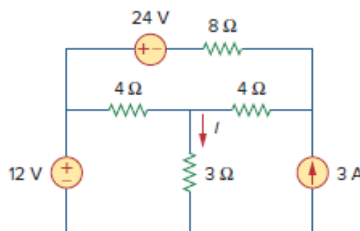
- Calculate the equivalent resistance R_{ab} . [7M]



- Obtain the star connected equivalent circuit of the delta connected circuit. [7M]

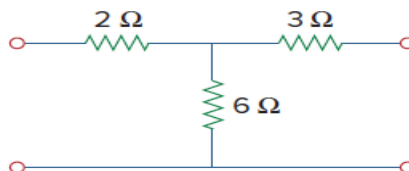
UNIT-II

- Explain about Z-parameters of a two-port network. [7M]
 - Determine the value of ‘i’ using superposition theorem. [7M]



(OR)

- State the maximum power transfer theorem and derive the expression for maximum power transferred to the load. [7M]
 - Find the hybrid parameters for the two-port network shown below. [7M]

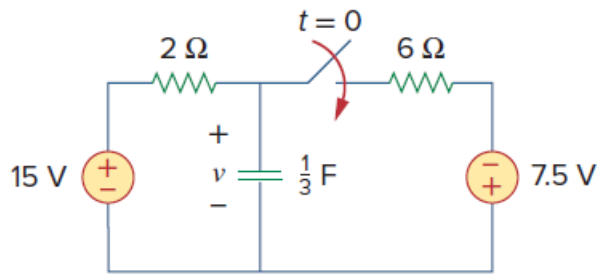


UNIT-III

5. a. A current of 5A flows through a non – inductive resistance in series with a choke coil when supplied at 250 V, 50 Hz. If the voltage across the non – inductive resistance is 125 V and across the coil 200V, calculate the impedance, reactance and resistance of the coil, power absorbed by the coil and the total power. [7M]
6. b. What is Resonance? Derive the expression for resonance frequency in a series RLC circuit. [7M]
(OR)
7. a. A series RLC circuit consists of a resistance of 25 Ω , inductance 0.4 H, capacitance of 250 μF is connected a supply of 230V, 50 Hz. Find the total impedance, current, power, power factor, voltage across coil and capacitance. [7M]
- b. An RLC series circuit has $R = 100$ ohms, $L = 500$ mH and $C = 40$ F. Calculate the
(i) Resonant frequency (ii) lower half-power frequency
(iii) Upper half-power frequency (iv) bandwidth (v) Q factor. [7M]

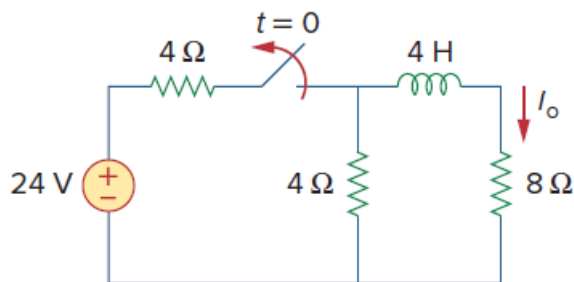
UNIT-IV

8. a. Derive the expression for voltage across capacitance of a series R-C circuit excited with a DC source at $t=0$. [7M]
- b. Find $v(t)$ for $t > 0$ in the circuit shown below. Assume the switch has been open for a long time and is closed at $t = 0$. [7M]



(OR)

9. a. Derive the expression for current through the inductor of a series R-L circuit excited with a DC source at $t=0$. [7M]
- b. Find ' i_0 ' in the following circuit for $t > 0$. [7M]



UNIT-V

10. a. Explain the constructional details of DC machine with neat sketch. . [7M]
- b. Derive an expression for the EMF induced in transformer. [7M]
(OR)
11. a. Explain the armature speed controlled method of DC motor. [7M]
- b. Explain the principle of operation of transformer. [7M]