



B.Tech III Semester Regular Examinations, February 2022
ELECTRICAL CIRCUIT ANALYSIS
(Electrical and Electronics Engineering)

Maximum Marks: 70

Date:22.02.2022 Duration: 3 hours

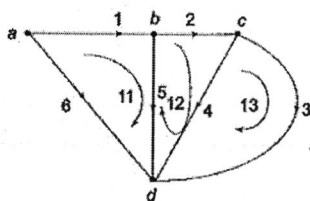
- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 State Thevenin's theorem.
- 2 Write the tie-set matrix for the following graph.



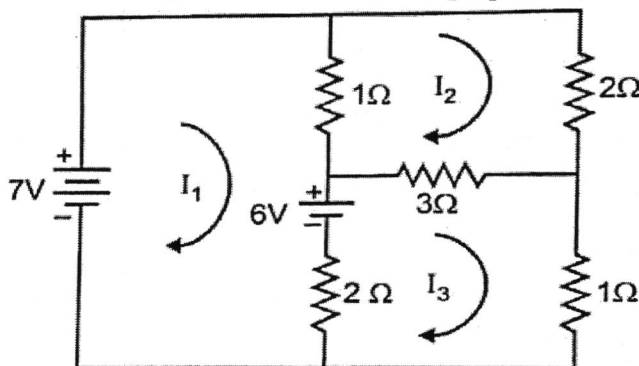
- 3 Define time constant of RL circuit.
- 4 Define transient and steady state response.
- 5 What is the necessity of dot convention in coupled circuits?
- 6 Define resonance.
- 7 Define poles and zeros of a function.
- 8 Define transfer function.
- 9 Write the condition of reciprocity and symmetry for Z-parameters?
- 10 Draw the equivalent circuit of a two-port network in terms of Y-parameters.

Part-B

Answer All the following questions.

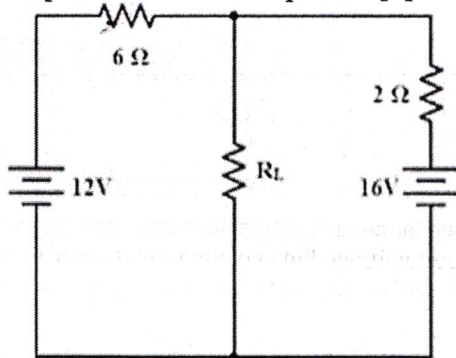
(5X10M=50Marks)

- 11 Using Mesh Analysis, determine the power in 3Ω resistor. [10]



OR

- 12 (a) State maximum power transfer theorem. [3]
(b) Calculate R_L such that maximum power is transferred to the load resistance(R_L). Also, compute the maximum power. [7]



- 13 Derive the response of series RLC circuit with DC excitation. [10]

OR

- 14 Obtain the transient response of series RC circuit when excited by a DC source. [10]

- 15 A resistance of 50Ω an inductance of 0.1 H, and a capacitance of $50\mu\text{F}$ are connected in series across a 230 V, 50Hz supply. Calculate (i) the value of impedance, (ii) current flowing (iii) Power consumed. [10]

OR

- 16 For a RL series circuit, Derive the: [10]

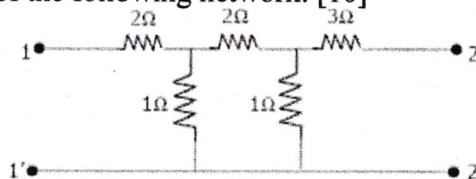
(a) Impedance (b) Power (c) Power triangle (d) Draw its phasor diagram

- 17 Analyze the series RC circuit using Laplace transform when a unit step input is applied. [10]

OR

- 18 Derive the response of series RL circuit with DC excitation using Laplace transform. [10]

- 19 Determine the Z-parameters of the following network. [10]



OR

- 20 Derive admittance parameters in terms of transmission parameters. [10]