Code No: **19EET302**

R19

II B. Tech I Semester Regular Examinations, March - 2021

ELECTRICAL CIRCUIT ANALYSIS

(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: Answer **ONE** question from each unit **(5 × 12 = 60 Marks)**

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UNIT-I

1. a) A balanced Y-connected load with a phase impedance of 40+j25Ω is supplied by a balanced, positive sequence Δ - connected source with a line voltage of 210 V. Calculate the phase currents? Use V_{RY} as reference. [6M]

   b) Briefly explain about three phase balanced star system. [6M]

(OR)

2. a) A unbalanced Δ - connected load having phase impedances Z_{RY} = 3+j4Ω, Z_{YB} = 4+j5Ω and Z_{BR} = 6+j8Ω connected to a balanced Δ - source of line voltage 420V. Then calculate [6M]

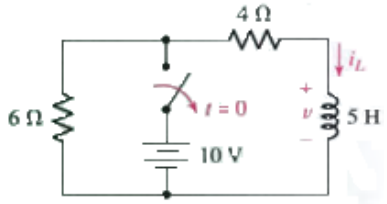
   i) Phase voltages ii) Phase currents iii) Line currents

   b) Obtain the relationship between line voltage and phase voltages in star connected system with necessary diagrams. [6M]

UNIT-II

3. a) Derive an expression for DC transient current in RL series circuit. [6M]

   b) Find the inductor voltage for the following circuit. [6M]



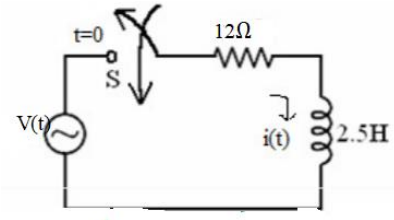
(OR)

4. a) In a series RL circuit, R = 8 ohms, L = 4H. A DC voltage of 100 V is applied at t = 0. Obtain the expression for i(t) and V_L(t). [6M]

   b) Derive an expression for DC transient current in RC series circuit and what is the need of Laplace transforms in transient analysis. [6M]

UNIT-III

5. a) A sinusoidal voltage of 120Sin50t is applied to a series circuit of R = 12Ω and L = 2.5H at t = 0 shown in below Figure. By Laplace transform method, determine the current i(t) for all t ≥ 0. Assume zero initial conditions. [6M]



   b) Derive the expression for transient response in series R-L circuit for AC excitation. Obtain the solution using Laplace transforms. [6M]
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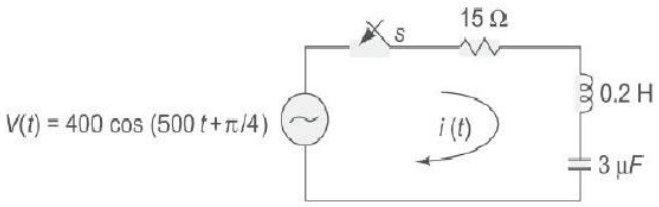
(OR)

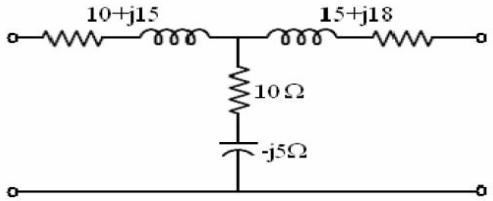
6. a) Derive the expression for transient response in series R-L-C circuit for AC excitation. Obtain the solution using Laplace transforms. [6M]

   b) In the circuit shown in Figure, determine the complete solution for the current, when the switch is closed at t = 0. [6M]



UNIT-IV

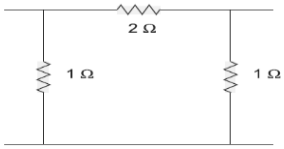
7. a) For the two-port network shown below, determine Z parameters. [6M]



   b) With suitable examples explain about cascaded networks. [6M]

(OR)

8. a) Determine the transmission parameters for the network shown in Figure. [6M]



   b) For a simple two port network derive Y- parameters and why these are called short circuit parameters? [6M]

UNIT-V

9. a) Explain Cauer method to synthesize driving point LC immittance function. [6M]

   b) The driving point Impedance function of a network is given by [6M]
   $Z(S) = S(S^2+10) / ((S^2+4)(S^2+16))$. Realize the network in first Foster form.

(OR)

10. a) Explain in brief about network synthesis. [6M]

    b) Explain the Foster and Cauer forms of RC networks. [6M]

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