Code No: 153AP

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, March - 2022
ELECTRICAL CIRCUIT ANALYSIS
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1.a) State and explain superposition theorem.
b) Using mesh analysis, find the current 'I' in the circuit shown in figure 1. [7+8]

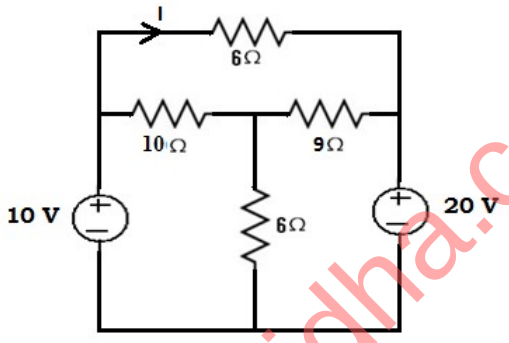

Figure: 1

2.a) State and explain maximum power transfer theorem.
b) Using Thevenin's theorem, find the current in 10Ω resistor in the circuit shown in figure 2. [7+8]

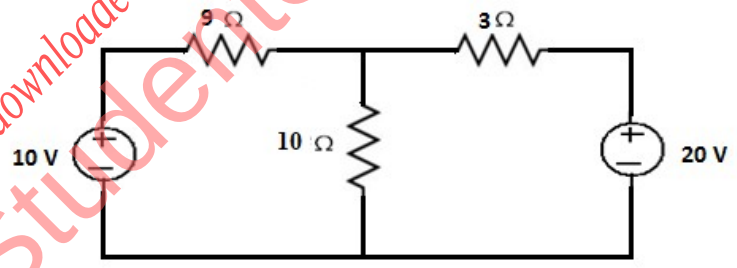

Figure: 2

3.a) Derive the expression for the transient current in series RL circuit with AC excitation.
b) Find the expression for the current i(t) in the circuit shown in figure 3. The initial voltage across the capacitor is 10 V and the initial current in the inductor is 5A. [8+7]

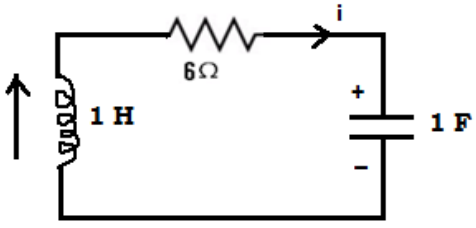

Figure: 3

4.a) Derive the expression for the transient current in series RLC circuit with DC excitation.

b) In the circuit shown in figure 4, determine the current in the inductor for t > 0. The switch is closed at t = 0. [8+7]

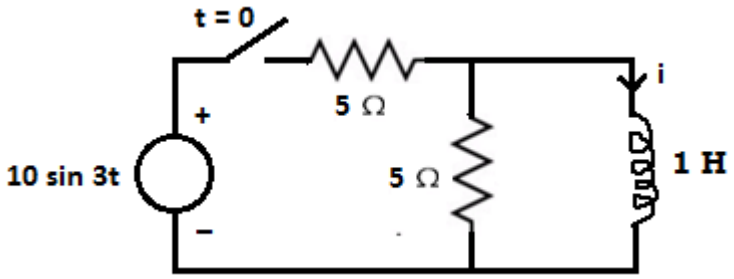

Figure: 4

5.a) Draw the phasor diagram of series RL circuit with sinusoidal excitation. Explain the relationship between different phasors.

b) Determine RMS and Average values of the waveform shown in figure 5. [8+7]

Figure: 5

6.a) Draw the phasor diagram of series RLC circuit with sinusoidal excitation. Explain the relationship between different phasors.

b) A balanced delta connected load draws 10 kW at a power factor of 0.8 lagging. If the three phase system has a line voltage of 400V, find the impedance of each phase and the total complex power of the load. [8+7]

7.a) Discuss in detail about the transfer function representation.

b) A series combination of resistance of 200Ω and a coil with inductance 1 H and winding resistance 10Ω and a capacitor of 0.5 μF is connected to an AC supply with internal resistance 5 Ω. Find the resonant frequency, quality factor, lower and upper cut off frequencies. [6+9]

8.a) What are hybrid parameters? How to calculate them?

b) For the circuit shown in figure 6, determine impedance parameters. [7+8]

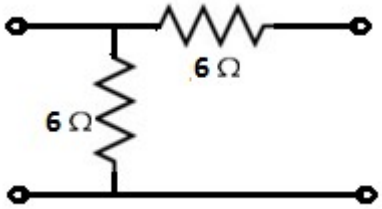

Figure: 6

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