R18

Code No: 153AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, October - 2020
ELECTRICAL CIRCUIT ANALYSIS
(Electrical and Electronics Engineering)

Time: 2 hours **Max. Marks: 75**

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

1.a) State and Explain superposition theorem in detail.
b) Using Nodal analysis, find V and I in the circuit below figure 1. [6+9]

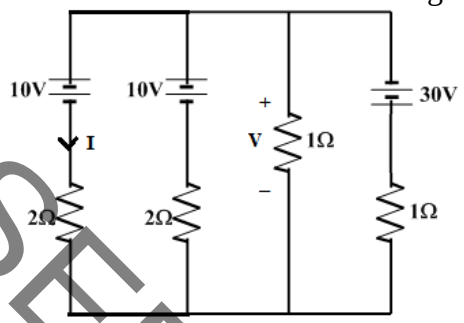


Figure: 1

2.a) State and Explain Maximum power transfer theorem in detail.
b) Using superposition theorem, find 'I' in the circuit below figure 2. [6+9]

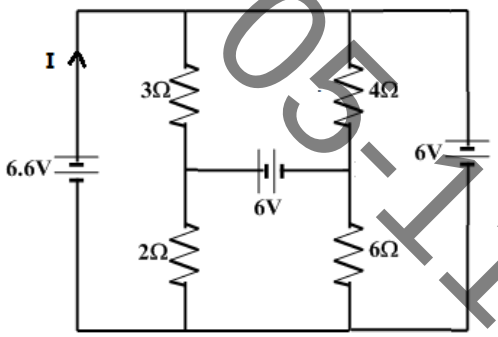


Figure: 2

3. Derive the expression for the complete response for current in a series RLC circuit excited by DC supply by closing the switch at $t=0^+$. [15]

4.a) Derive the expression for the complete response for the voltage across inductor in parallel RL circuit excited by sinusoidal supply.
b) In the circuit shown below figure 3, the switch S is opened at t=0. Prior to that, switch was closed. Derive the current i(t) for t>0. [7+8]

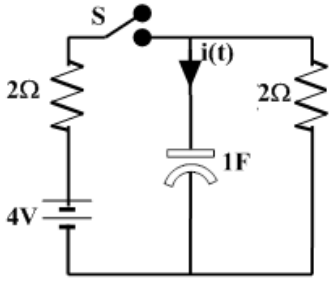


Figure: 3

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5.a) Prove that the line voltage is √3 times the phase voltage in three phase star connected balanced system

b) A coil with an internal resistance of 1 Ω is connected in parallel to a capacitor of 10 mF. The circuit takes a current of 1A when connected to a 100V, 50Hz supply. Determine the current in the inductor when the supply is 50 V, 60 Hz. [8+7]

6.a) Derive the expression for effective value of symmetrical square waveform whose side is 'A'

b) Each phase of a star-connected load comprises a resistance of 10Ω and a 10 mH inductor in series. Determine active power, reactive power and apparent power that will be consumed by the load when connected across a 450V, 50Hz, 3 phase supply. [7+8]

7.a) What are the basic properties inverse Laplace transforms? Explain.

b) A parallel RLC circuit has a resistance of 10Ω, a capacitance of 5 mF, and an inductance of 20 mH. Find the resonant frequency and half power frequencies. [8+7]

8.a) Derive the relationship between impedance and admittance parameters.

b) Determine the transmission parameters of the network below figure 4. [6+9]

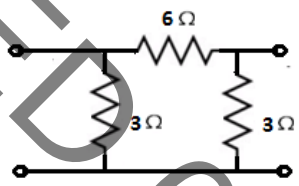


Figure: 4

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