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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations December-2021

ELECTRICAL CIRCUITS-II

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

- 1 a Derive the relationship between Phase and Line voltages, currents in star connected load. **L3 6M**
- b A three phase balanced delta connected load of $(4+j8) \Omega$ is connected across a 400V, 3- ϕ balanced supply. Determine the phase currents and line currents. And also power drawn by the load. Assume RYB phase sequence. **L3 6M**

OR

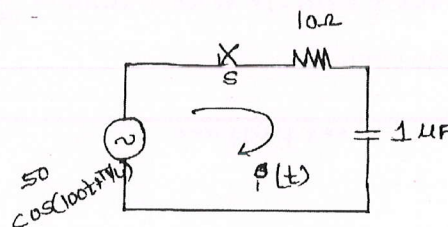
- 2 a Derive the relationship between Phase and Line voltages, currents in delta connected load. **L3 6M**
- b An unbalanced 4-wire star connected load has a balanced voltage of 400V. The load are $Z_1=(4+j8)\Omega$, $Z_2=(5+j4)\Omega$, $Z_3=(15+j20)\Omega$. Calculate line currents, current in neutral wire, total power. **L3 6M**

UNIT-II

- 3 a Derive the transient response of an RL circuit with AC excitation. **L4 6M**
- b Derive the transient response of an RC circuit with DC excitation. **L4 6M**

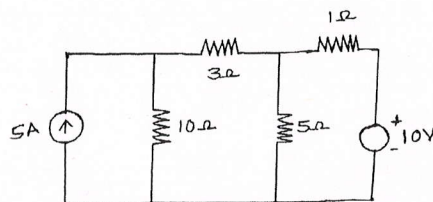
OR

- 4 a A series RC circuit consists of resistor of 10Ω and capacitor of $0.1F$ has a constant voltage of 20v is applied to the circuit at $t=0$. obtain the current equation. Determine the voltage across the resistor and the capacitor. **L3 6M**
- b In the circuit shown in fig. Determine the complete solution for the current when switch is closed at $t=0$, applied voltage is $V(t)=50\cos(102t+\pi/4)$, resistance $R=10\Omega$ and capacitance $c=1\mu F$. **L3 6M**

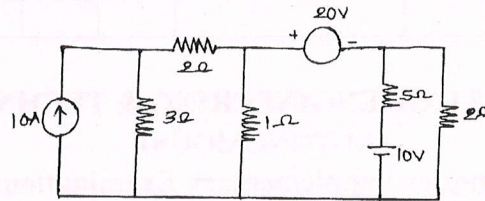


UNIT-III

- 5 a Determine current in 10Ω resistor for the following network by using nodal analysis. **L3 6M**



- b Determine current in 5Ω resistor for the circuit shown in figure.



OR

- 6 a i. Define graph. L1 6M
 ii. Define planar and non-planar graph.
 iii. Define duality.
 b i. Define cut-set. L1 6M
 ii. Define tie-set.
 iii. What is network topology?

UNIT-IV

- 7 a Derive the expressions for Z-parameters in terms of ABCD parameters. L3 6M
 b Derive the expressions for Y-parameters in terms of ABCD parameters? L3 6M

OR

- 8 a Derive the expressions for h-parameters of a two port network? L3 6M
 b Derive the expressions for transmission parameters of a two port network? L3 6M

UNIT-V

- 9 a A 500Ω resistor, a 16mH inductor, and a 25 nF capacitor are connected in parallel which is placed in series with a 2000Ω resistor. Express the impedance of this series combination as a rational function of s . L4 6M
 b A $1\text{K}\Omega$ resistor is in series with a 500mH inductor. This series combination is in parallel with a $0.4\mu\text{F}$ capacitor. Express the equivalent s -domain impedance of these parallel branches as a rational functional. L4 6M

OR

- 10 a The unit impulse response of a circuit is L3 6M

$$v_o(t) = 10,000e^{-70t} \cos(240t + \theta)u(t)\text{V} \text{ Where } \tan\theta = \frac{7}{24}$$
 Find the transfer function of the circuit.
 b The unit impulse response of a circuit is L3 6M

$$v_o(t) = 10,000e^{-70t} \cos(240t + \theta)u(t)\text{V} \text{ Where } \tan\theta = \frac{7}{24}$$
 Find the unit step response of the circuit.

*** END ***