Q.P. Code: 16EE203 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

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

NETWORK ANALYSIS AND SYNTHESIS

(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 of voltage and current in delta connected load. **6M**

b A balanced star connected load having an impedance (15+j20) Ω per phase is connected to a three phase 440 V,50Hz supply. Find line currents and phase voltages. Assume RYB phase sequence and also calculate power drawn by the load. **6M**

OR

2 **a** A balanced delta connected load of (4+j3) Ω per phase is connected to a balanced 3¢ 400V supply. Find a) active power b) reactive power c)Apparent power. **6M**

b Briefly explain two wattmeter method to measure real power and reactive power: **6M**

UNIT-II

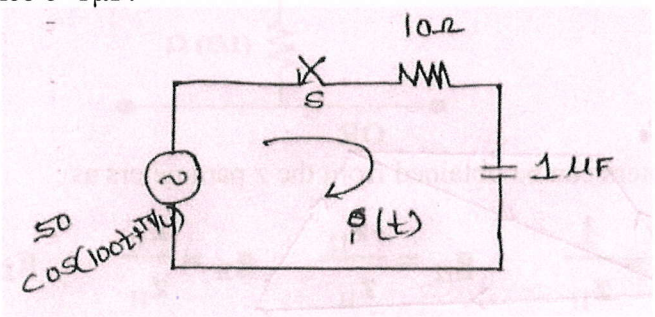
3 **a** Derive the transient response of an RL circuit with DC excitation. **8M**

b A series RC circuit consists of resistor of 10 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. **4M**

OR

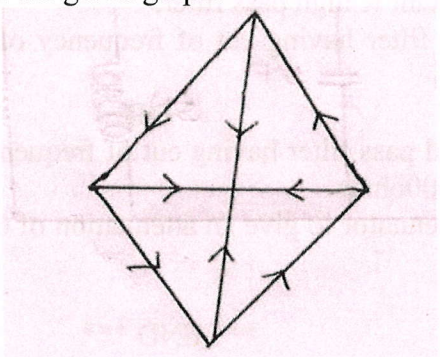
4 **a** Derive the transient response of an RL circuit with sinusoidal excitation. **7M**

b In the circuit shown in fig. Determine the complete solution for the current when switch is closed at t=0,applied voltage is $V(t)=50\cos(10^2t+\pi/4)$,resistance R=10Ωand capacitance c=1μF. **5M**

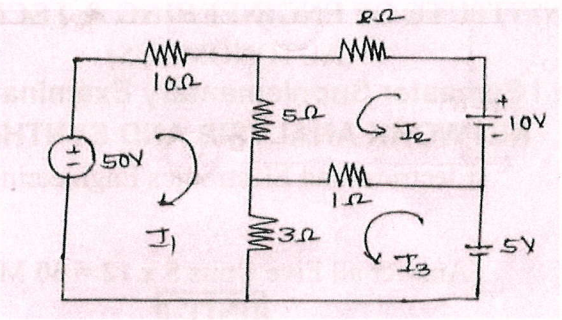


UNIT-III

5 **a** Find the cut set matrix for the given graph: **6M**



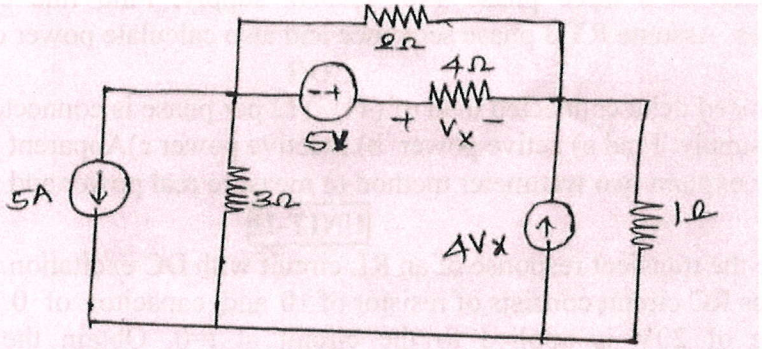
b Determine mesh currents for the following network using network topology. 6M



OR

6 a Define graph, oriented graph, tie set and cutset 4M

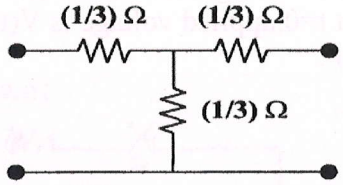
b Draw the dual network: 8M



UNIT-IV

7 a Derive Z parameters in term of transmission parameters: 6M

b Determine y parameters: 6M



OR

8 a Prove the g parameters can be obtained from the z parameters as 6M

$$g_{11} = \frac{1}{z_{11}} \qquad g_{12} = \frac{-z_{12}}{z_{11}} \qquad g_{21} = \frac{z_{21}}{z_{11}} \qquad g_{22} = \frac{\Delta_z}{z_{11}}$$

b Derive the condition for reciprocity in h-parameters: 6M

UNIT-V

9 a Explain about constant K high pass filter. 6M

b Design a low pass filter having cut of frequency of 2KHz with load resistance of 500ohms. 6M

OR

10 a Design K-type band pass filter having cut of frequency of 2KHz &10KHz and with load resistance of 600ohms. 6M

b Design a T- pad attenuator to give an attenuation of 60dB and to work in line of 500 ohms impedance. 6M

*** END ***