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

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations June 2019

NETWORK ANALYSIS & SYNTHESIS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

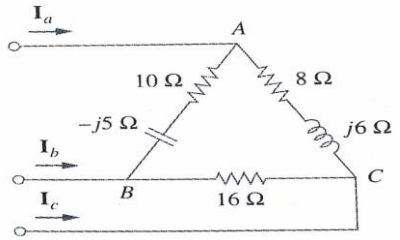
1 **a** Derive the relation between phase and line quantities in a 3-phase balanced Delta connected system with the help of phasor diagram. 6M

b An unbalanced 4 wire star connected load has a balanced voltage of 400 V. The loads are Z1=(4+j8) Ω ,Z2=(5+j4) Ω, Z3=(15+j20) Ω. Calculate line currents, current in neutral wire, total power consumed by the load. 6M

OR

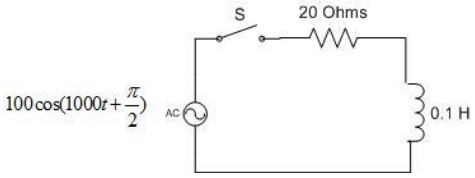
2 **a** Derive the relation between phase and line quantities in a 3-phase balanced Star connected system with the help of phasor diagram. 6M

b The circuit shown in Figure with an unbalanced Delta connected load is supplied by balanced line to line voltage 440 V in positive sequence. Find line currents when V_{ab} taking as reference. 6M



UNIT-II

3 **a** For the circuit shown in Figure find the current when the switch is closed at t=0. 6M



b Derive the transient response of an RC circuit with DC excitation. 6M

OR

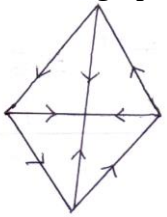
4 **a** A series RLC circuit with R=20 Ω, L=0.05 H and C=20 μF has a constant voltage 100V applied at t=0. Using Laplace transforms, find the current transient assuming zero initial conditions. 7M

b Derive the transient response of an RL circuit with AC excitation. 5M

UNIT-III

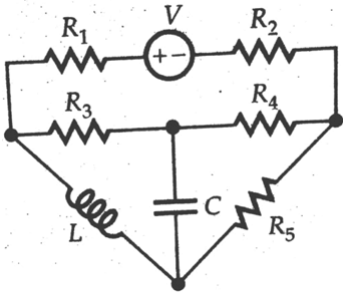
5 **a** Define the following terms with suitable example 8M
(i) Tree (ii) Co-tree (iii) Oriented graph (iv) Fundamental loop

b Determine the fundamental tie set matrix of the graph shown in Figure 4M

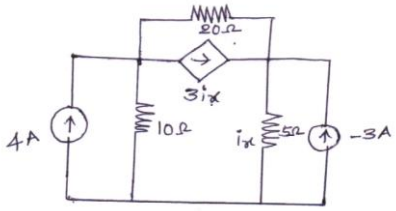


OR

6 **a** Develop the dual network of the circuit shown in Figure. 6M



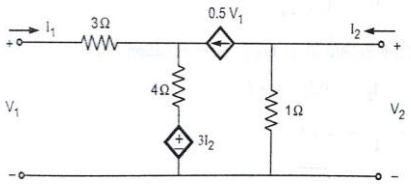
b Determine ix for the following network using network topology of the network shown in Figure. 6M



UNIT-IV

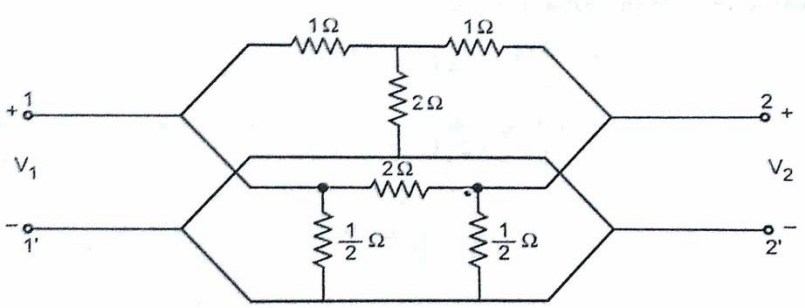
7 **a** Express y-parameters in terms of transmission parameters for a two port network. 6M

b Calculate 'h' parameters of the network shown in Figure. 6M



OR

8 **a** Determine Y- parameters of the network shown in Figure. 6M



b Express Z-parameters in terms of h-parameters for a two port network. 6M

UNIT-V

9 **a** Derive the design equations of m-derived high pass filter 5M

b Design K-type band pass filter having a design impedance of 500 Ω and cut-off frequencies f_1=1Khz and f_2=10Khz 7M

OR

10 **a** Design a π-type attenuator to give 20 dB attenuation and to have a characteristic impedance of 100 Ω. 6M

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

*** END ***