SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : NAS (16EE203) **Course & Branch**: B.Tech - EEE

Year & Sem: II-B.Tech & I-Sem **Regulation:** R16

UNIT-I

THREE PHASE CIRCUITS

1. Derive the relationship of voltage and current in star connected load. [10M]
2. Derive the relationship of voltage and current in delta connected load. [10M]
3. A three phase balance delta connected load of (4+j8) Ω is connected across a 400V,3¢ balanced supply. Determine the phase currents and line currents. And also power drawn by the load. Assume RYB phase sequence. [10M]
4. 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. [10M]
5. A balanced star connected load of (4+j3) Ω per phase is connected to a balanced 3¢ 400v supply. The phase current is 12 A. Find a) active power b) reactive power
   c) Apparent power. [10M]
6. A balanced delta connected load of (4+j3) Ω per phase is connected to a balanced 3¢ 440v supply. The phase current is 12 A. Find a) active power b) reactive power
   c) Apparent power. [10M]
7. Three impedances $Z_1=20\angle 30$, $Z_2=40\angle 60$,$Z_3=10\angle -90$ are delta connected to a 400V,3¢ System. Determine i) phase currents ii) line currents iii) total power consumed by the load. [10M]
8. An unbalanced 4 wire star connected load has a balanced voltage of 400V. The load are Z_1=(4+j8) Ω ,Z_2=(5+j4)Ω ,Z_3=(15+j20)Ω .Calculate line currents , current in neutral wire, total power. [10M]
9. A 400V,3¢ supply feeds an unbalanced 3 wire star connected 3 wire, star connected load. The branch impedances of the load are Z_R=(4+j8)Ω ,Z_Y=(3+j4)Ω ,Z_B=(5+j20)Ω. Find the line currents and voltages across phase impedance. Assume RYB phase sequence. [10M]
10. a) Write the voltage and current relationship in star connected system? [2M]
    b) Write the voltage and current relationship in star connected system? [2M]
    c) What are the different methods are used to solve the unbalanced systems? [2M]
    d) Draw the star connected load. [2M]
    e) Draw the delta connected load. [2M]

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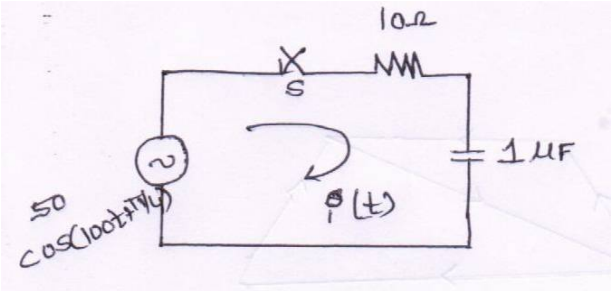
UNIT-II
TRANSIENT ANALYSIS

1. Derive the transient response of an RL circuit with dc excitation. [10M]
2. Derive the transient response of an RC circuit with dc excitation. [10M]
3. Derive the transient response of an RLC circuit with dc excitation. [10M]
4. Derive the transient response of an RL circuit with Ac excitation. [10M]
5. Derive the transient response of an RLC circuit with AC excitation. [10M]
6. Derive the transient response of an RC circuit with AC excitation. [10M]
7. A series RL circuit with R=30Ω and L=15H has a constant voltage V=60V applied at t=0. Determine the current I, the voltage across the resistor and across the inductor. [10M]
8. 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. [10M]
9. 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. [10M]



10.a) Define steady state. [2M]
b) Define transient state. [2M]
c) Find the Laplace transform of the function $f(t) = 4t^3+t^2-6t+7$? [2M]
d) Find L{ $\cos^2 t$}? [2M]
e) What is the transient response of RL series circuit with dc excitation? [2M]

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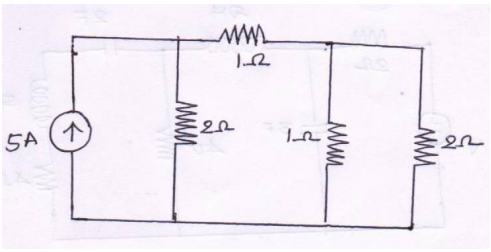
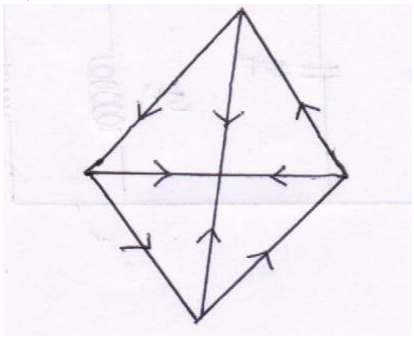
UNIT –III

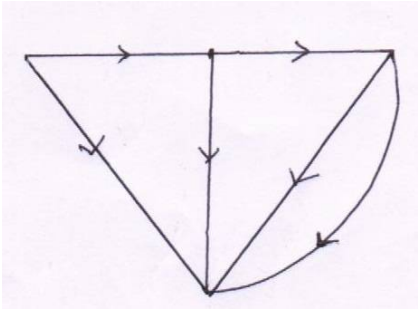
NETWORK TOPOLOGY

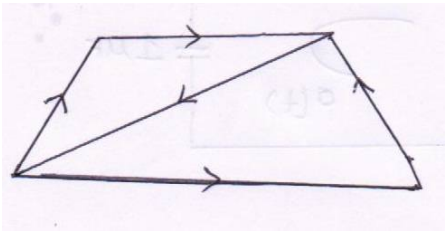
1. Find the cutset matrix for the followings?
   a) [5M] b) [5M]



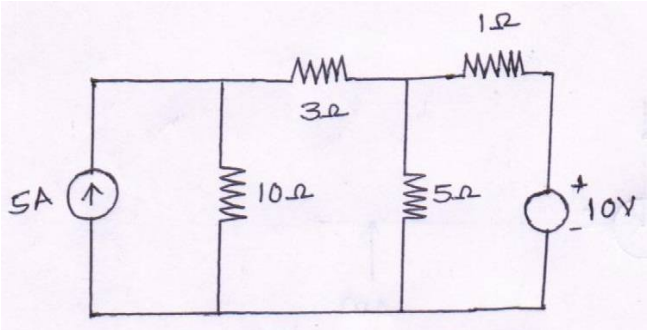


2. Find the tieset matrix for the followings?
   a) [5M] b) [5M]

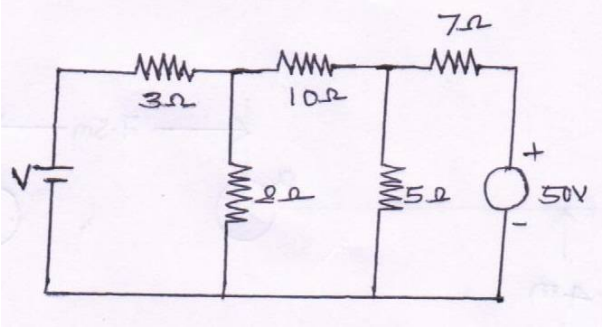




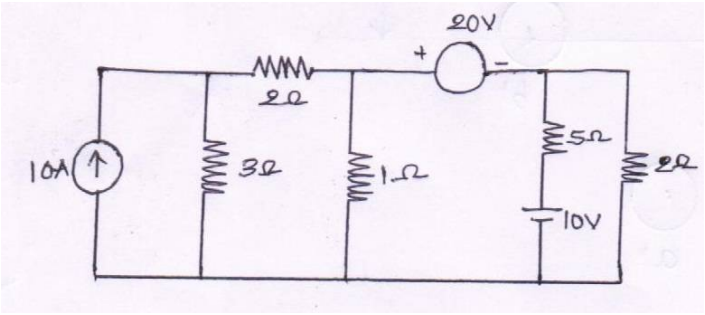
3. Determine current in 10Ω resistor for the following network by using nodal analysis. [10M]



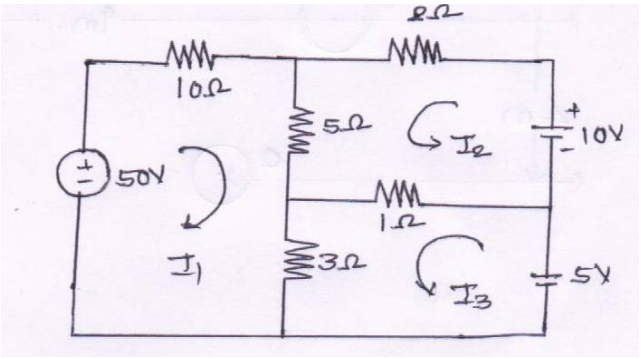
4. Find voltage V for the circuit shown in fig which makes the current in the 10Ω resistor is zero by using nodal analysis? [10M]



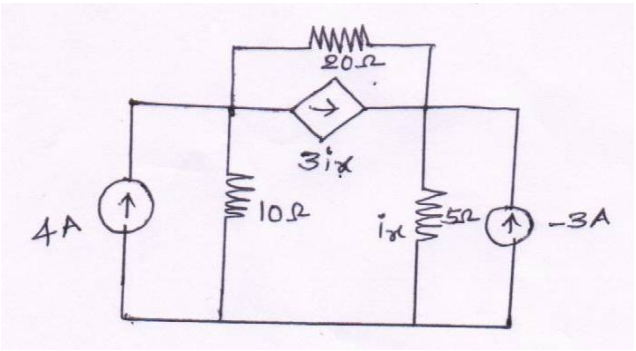
5. Determine current in 5Ω resistor for the circuit shown in figure. [10M]



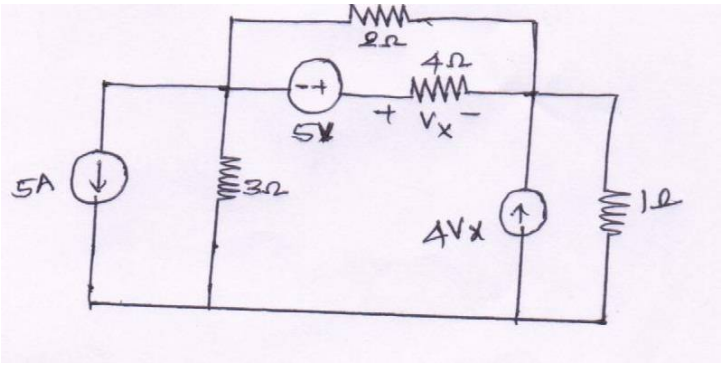
6. Determine mesh currents for the following network. [10M]



7. Determine i_x for the following network. [10M]

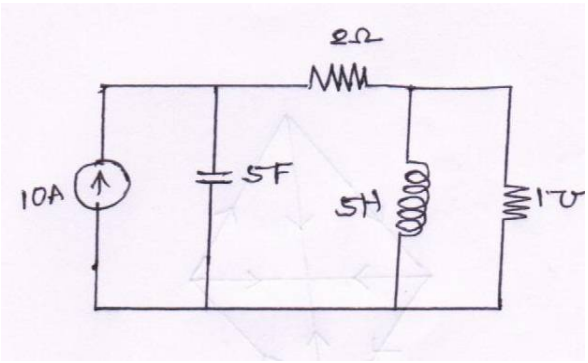


8. For the circuit shown in figure. Find the voltage across 4Ω resistor using nodal analysis. [10M]

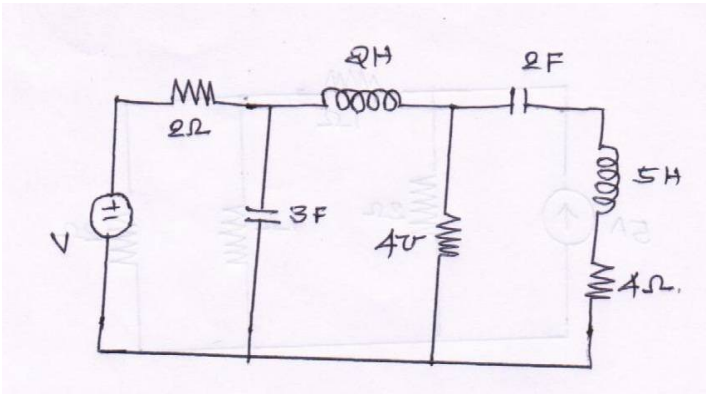


9. Write the procedure to draw the dual network and find dual network for the followings. [10M]

a) [5M]



b) [5M]



10. a) Define graph. [2M]
    b) Define planar and non-planar graph. [2M]
    c) Define duality. [2M]
    d) Define cutest. [2M]
    e) Define tieset. [2M]

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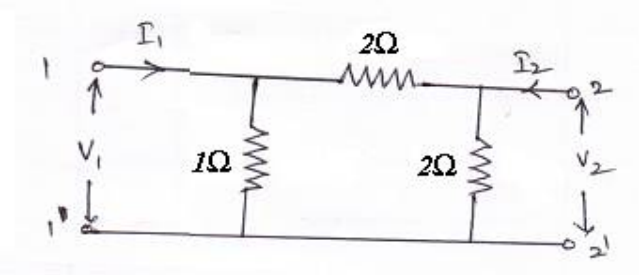
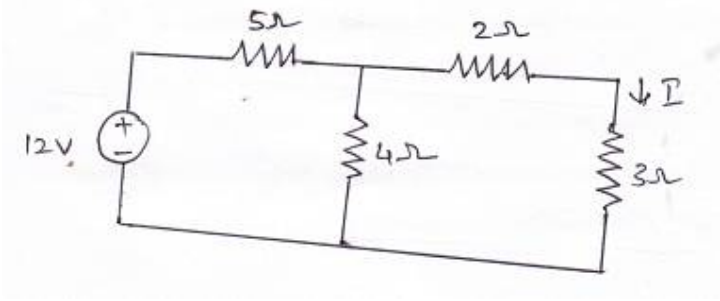
UNIT-IV

TWO PORT NETWORKS

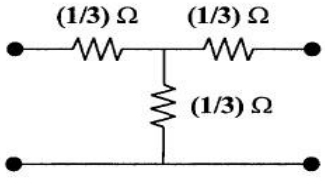
1. Derive the expressions for Z-parameters in terms of ABCD parameters. [L3] [10M]
2. Find the Z - parameters for the resistance network shown in figure (B) [L1] [10M]



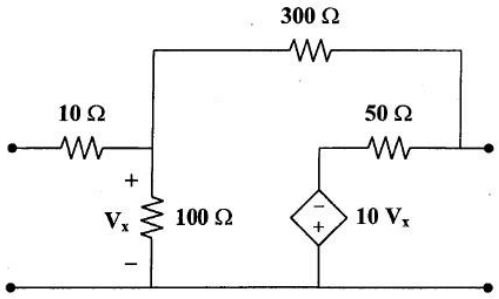
3. Verify Reciprocity Theorem for the network shown in figure (b) [L3] [10M]



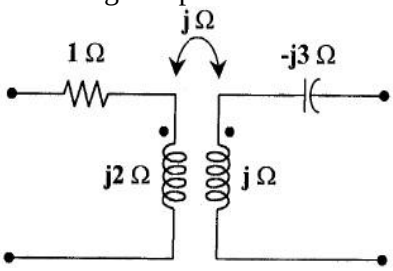
4. Derive the expressions for Y-parameters in terms of ABCD parameters? [L3] [10M]
5. Derive the expressions for h-parameters of a two port network? [L3] [10M]
6. Determine Y parameters of the following network



7. Obtain h and g parameters of following two port network.



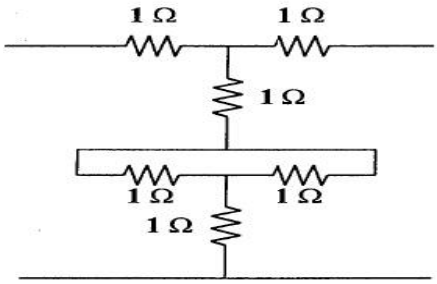
8. Obtain the T parameters of the following two port network



9. Prove the g parameters can be obtained from the z parameters as

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

10. Determine the Z parameters of the following two port network.



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UNIT-V
FILTERS & SYMMETRICAL ATTENUATORS

1. Explain about different types of filters. [10M]
2. Explain about constant K low pass filter. [10M]
3. Explain about constant K high pass filter. [10M]
4. Design a high pass filter having cut of frequency of 1KHz with load resistance of 600ohms.

[10M]

5. Design a low pass filter having cut of frequency of 2KHz with load resistance of 500ohms. [10M]
6. Design a low pass filter having cut of frequency of 5KHz with load resistance of 800ohms. [10M]
7. Design K-type band pass filter having cut of frequency of 2KHz &10KHz and with load resistance of 500ohms. [10M]