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

QUESTION BANK (DESCRIPTIVE)

Subject with Code : EC-II (18EE0202) **Course & Branch**: B.Tech - EEE

Year & Sem: II-B.Tech & I-Sem **Regulation:** R18

UNIT-I

THREE PHASE CIRCUITS

1. Derive the relationship between Phase and Line voltages, currents in star connected load. [L5][10M]
2. Derive the relationship between Phase and Line voltages, currents in delta connected load. [L5][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. [L3][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. [L3][10M]
5. A balanced star 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. [L3][10M]
6. A balanced delta connected load of (4+j3) Ω per phase is connected to a balanced 3¢ 440v supply.. Find a) active power b) reactive power c) Apparent power. [L3][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. [L3][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. [L3[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. [L3][10M]
10. The two wattmeter method is used to measure power in a three phase load.The wattmeter readings are 400W and -35W.calculate(i) total active power (ii) reactive power (iii) power factor. [L3][10M]

1.Write the voltage and current relationship in star connected system?	[L3][2M]
2.Write the voltage and current relationship in star connected system?	[L3][2M]
3.What are the different methods are used to solve the unbalanced systems?	[L4][2M]
4.Draw the star connected load.	[L5][2M]
5.Draw the delta connected load.	[L5][2M]
6.Define line voltage.	[L2][2M]
7.Define phase voltage.	[L2][2M]
8.What are the advantages of three phase systems.	[L4][2M]
9.Write the power formula in star connected network.	[L3][2M]
10.Write the power formula in star connected network.	[L3][2M]

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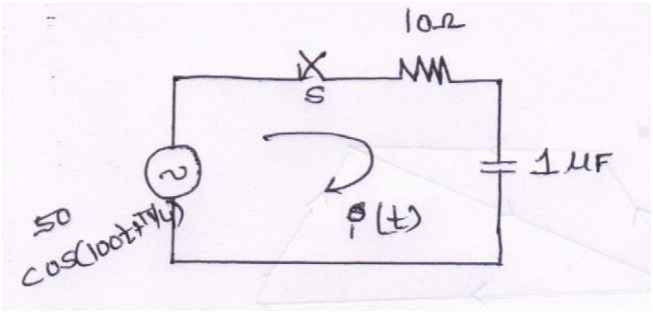
UNIT-II
TRANSIENT ANALYSIS

1. Derive the transient response of an RL circuit with dc excitation. [L5][10M]
2. Derive the transient response of an RC circuit with dc excitation. [L5][10M]
3. Derive the transient response of an RLC circuit with dc excitation. [L5][10M]
4. Derive the transient response of an RL circuit with Ac excitation. [L5][10M]
5. Derive the transient response of an RLC circuit with AC excitation. [L5][10M]
6. Derive the transient response of an RC circuit with AC excitation. [L5][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. [L3][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. [L3] [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)=50cos(10^2t+π/4),resistance R=10Ωand capacitance c=1μF. [L3] [10M]



10.Derive the response of a R-L networks to pulse excitation. [L3][10M]

1.Define steady state. [L2][2M]
2.Define transient state. [L2][2M]
3.Find the Laplace transform of the function f(t) =$4t^3+t^2-6t+7$? [L1][2M]
4.What is the laplace transform of a unit step function? [L4][2M]
5.What is the transient response of RL series circuit with dc excitation? [L4][2M]
6.What is the time constant of RC circuit? [L4][2M]
7.What is transient? [L4][2M]

8.Define forced response. [L2][2M]
9.Define natural response. [L2][2M]
10.Define response. [L2][2M]

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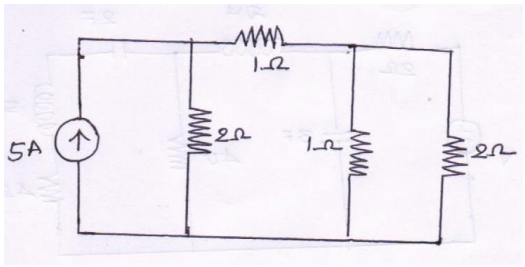
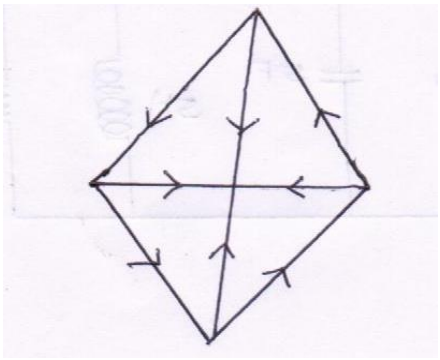
UNIT –III

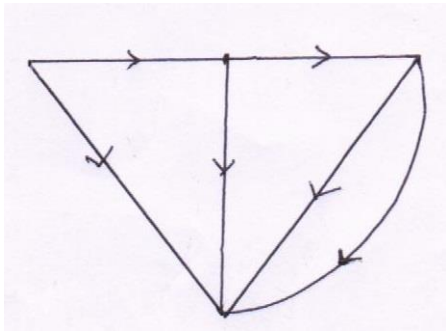
NETWORK TOPOLOGY

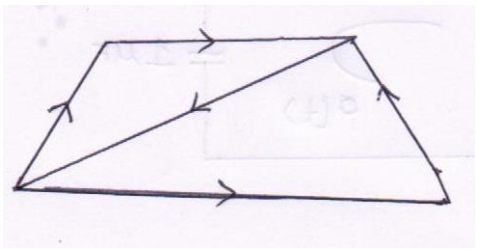
1. Find the cutset matrix for the followings?
   a) [L1][5M] b) [L1][5M]



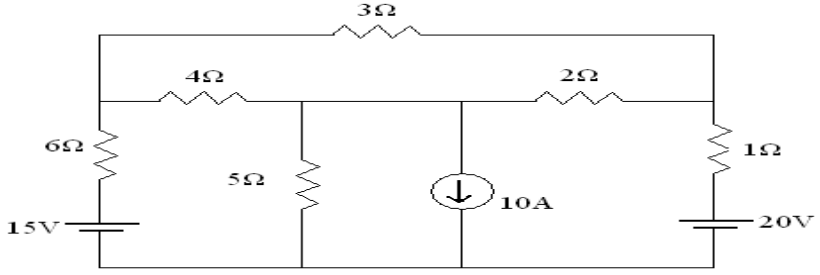


2. Find the tieset matrix for the followings?
   a) [L1][5M] b) [L1][5M]

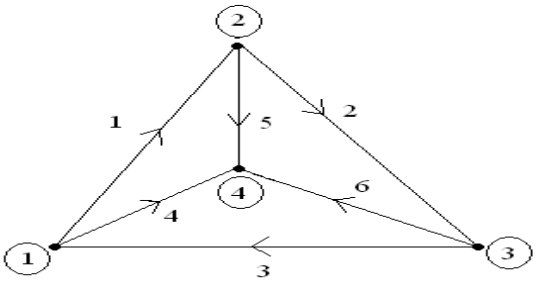




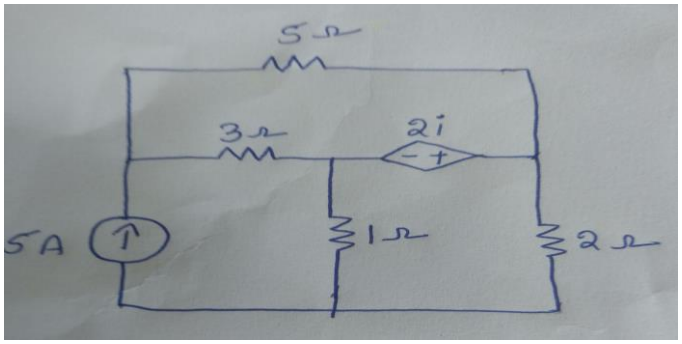
3. For the network shown in figure given below, find the tie set matrix by constructing network graph.. [L1][10M]



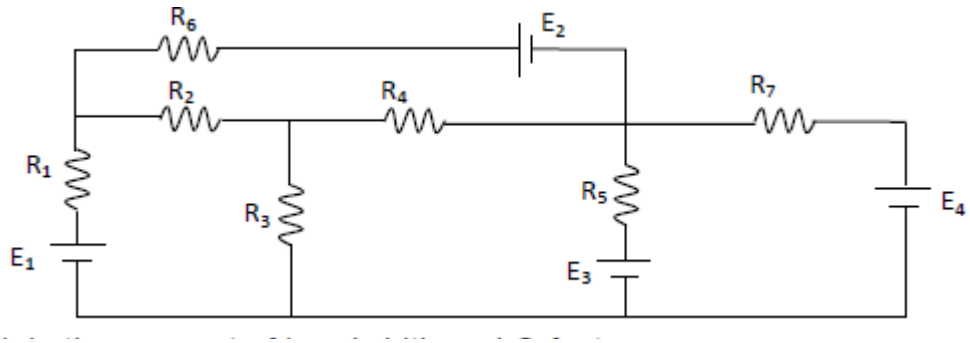
4. In the network graph shown in figure, determine cut set matrix and write the relation between node voltages and branch voltages. Choose 4, 5 & 6 are twigs. [L6][10M]



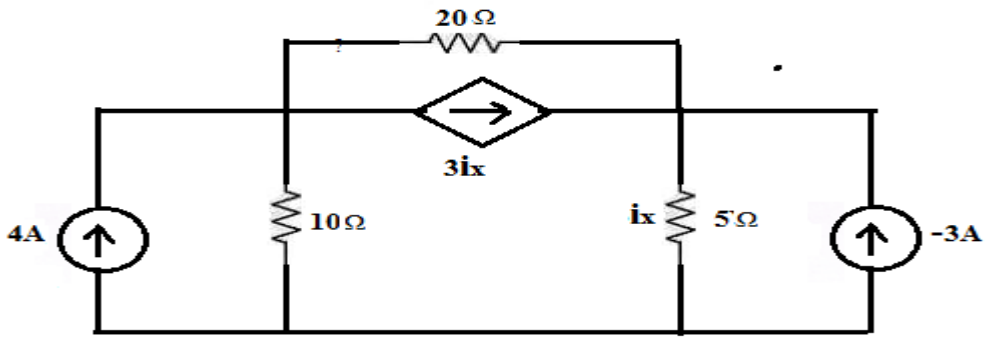
5. Determine current in 5Ω resistor by using nodal method for the circuit shown in figure. [L6][10M]



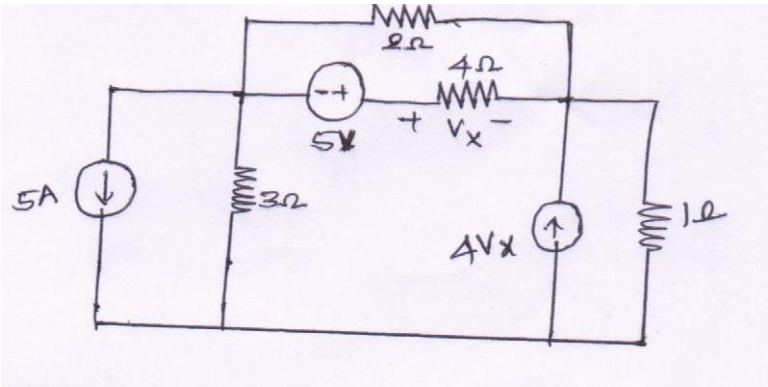
6. Draw the oriented graph of the network shown in figure below and write the cut set matrix. [L5][10M]



7. Determine i_x for the following network. [L6][10M]

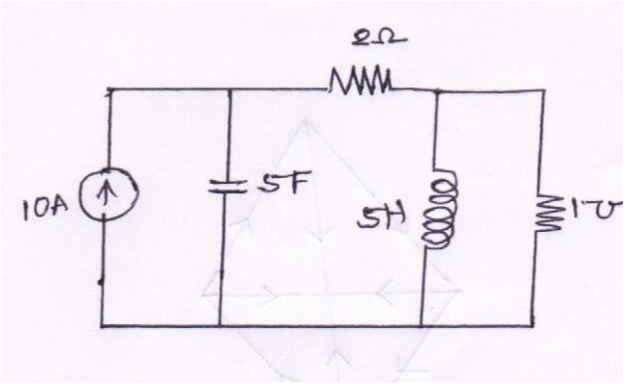


8.For the circuit shown in figure. Find the voltage across 4Ω resistor using nodal analysis. [L1][10M]

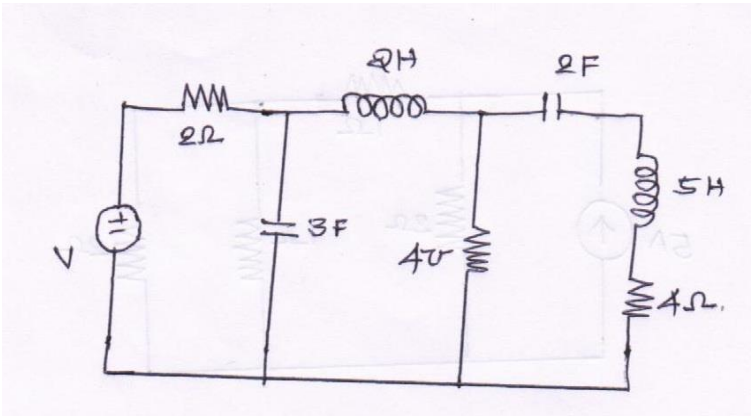


9.Write the procedure to draw the dual network and find dual network for the followings.

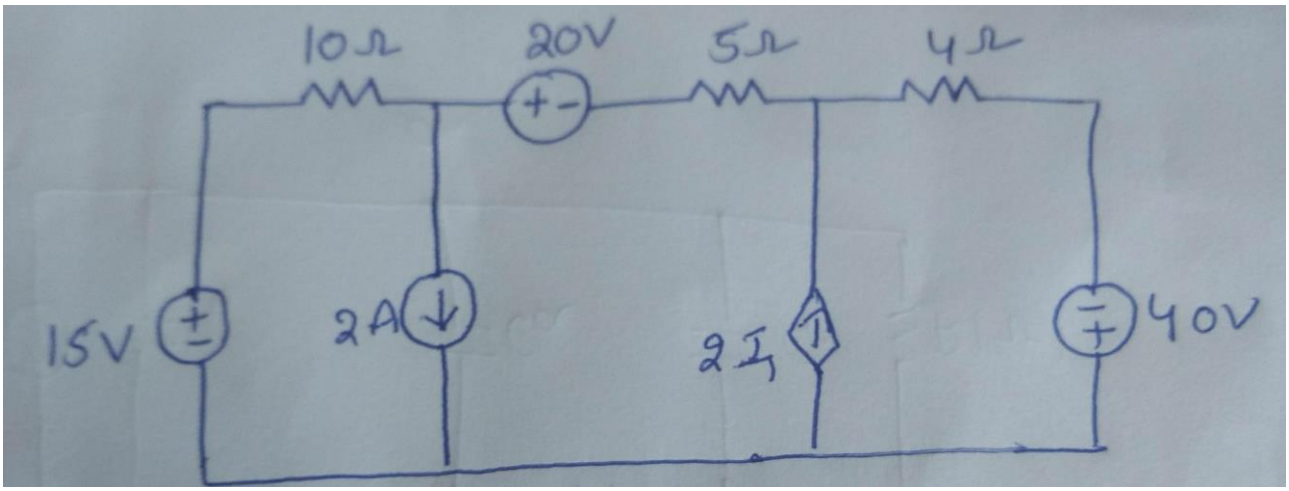
a) [L6][5M]



b) [L6][5M]



10.For the circuit shown in figure find the current through 10 Ω resistor ,by using mesh analysis. [L1][10M]



1.Define graph. [L2][2M]
2.Define planar and non-planar graph. [L2][2M]
3.Define duality. [L2][2M]
4.Define cutest. [L2][2M]
5.Define tieset. [L2][2M]
6.Define tree. [L2][2M]
7.Define co-tree. [L2][2M]
8.Define twigs. [L2][2M]
9.Define sub graph. [L2][2M]
10.Define directed graph

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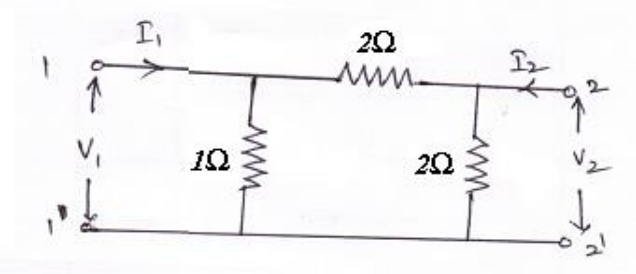
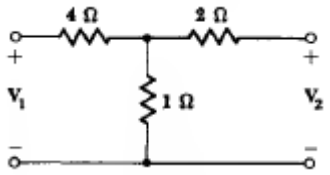
UNIT-IV

TWO PORT NETWORKS

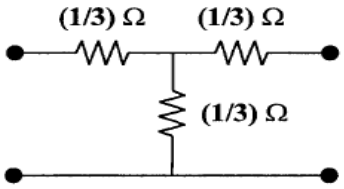
1. Derive the expressions for Z-parameters in terms of ABCD parameters. [L3] [10M]
2. Find the Z - parameters for the resistance network shown in figure (B) [L1] [10M]



3. Find the hybrid parameters for the circuit shown in fig. [L1] [10M]

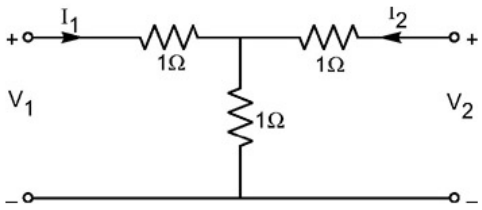


4. Derive the expressions for Y-parameters in terms of ABCD parameters? [L3] [10M]
5. Derive the expressions for h-parameters of a two port network? [L3] [10M]
6. Determine Y parameters of the following network [L1] [10M]



7. The given A,B,C&D parameters are A=20,B=-14,C=25,D=-12 respectively find
   i)Z- parameters.ii)y-parameters [L5] [10M]

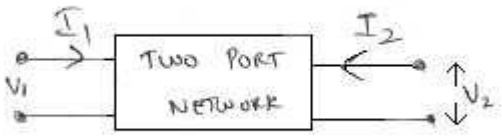
8. Obtain the T parameters of the following two port network. [L1] [10M]



9. (a)Define and explain about Impedance parameters. [L2] [5M]

   (b)Define and expalin about Y- parameters. [L2] [5M]

10. For the two port n/w shown in the figure, the currents I1 and I2 entering at port1 and 2 respectively are given by the equations.
    I1 = 0.5 V1 - 0.2 V2
    I2 = - 0.2V1 + V2



Where V1 and V2 are the port voltages at port 1 and 2 respectively. Find the Y, Z, ABCD parameters for the n/w. [L1] [10M]

1.Define and explain two port networks. [L2][2M]
2.Write down general equations for hybrid parameters. [L3][2M]
3.Write equations for Z-parameters. [L3][2M]
4.What is the condition for reciprocity in Z and Y parameters? [L4][2M]
5. What is the condition for symmetry in h and ABCD parameters. [L4][2M]
6. What is the condition for reciprocity in h and ABCD parameters? [L4][2M]
7. What is the condition for symmetry in Z and Y parameters? [L4][2M]
8. What are the units of h11 and h21. [L4][2M]
9. Draw the equivalent circuit of Z parameters. [L5][2M]
10.What are the units of Z11 and Y21. [L4][2M]

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UNIT – V
ANALYSIS OF ELECTRICAL CIRCUITS USING LAPLACE TRANSFORMS

1.a) Define Laplace transform of a function. [L2][5M]
b) Derive Laplace transform of all standard signals. [L2][5M]

2. Find the signal y(t), the Laplace transform of signal which is Y(S) = $\frac{S^3+7S^2+18S+20}{S^2+5X+6}$ [L1][10M]

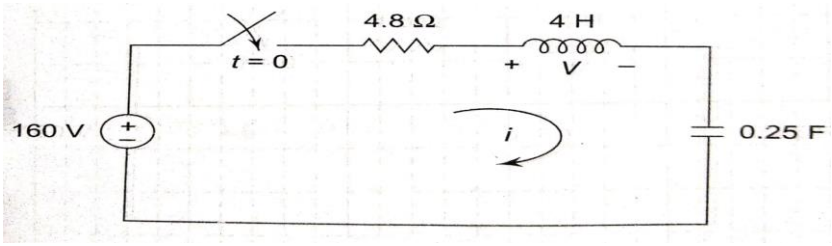
3. Find the inverse Laplace transform of F(S) = $\frac{1}{(S+2)^2}$ [L1][10M]

4. Using the initial value theorem, find the initial value of the signal corresponding to the Laplace transform. Y(S) = $\frac{S+1}{S(S+2)}$ [L1][10M]

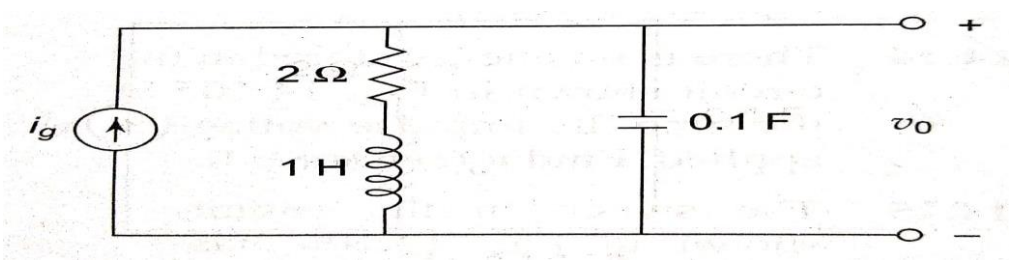
5. A 500Ω resister, a 16Mh inductor, and a 25 nF capacitor are connected in parallel which is placed in series with a 2000Ω resistor. Express the impedance of this series combination as a rational function of s. [L3][10M]

6. A 1kΩ resistor is in series with a 500mH inductor. This series combination is in parallel with a 0.4μF capacitor. Express the equivalent s-domain impedance of these parallel branches as a rational functional. [L3][10M]

7. The energy stored in the circuit shown is zero at the time when the switch is closed. (A) find the s- domain expression for *I* (B) find the time domain expression for i when t > 0. (c)) find the s- domain expression for V. (d)) find the time domain expression for v when t > 0. [L3][10M]



8. Derive the numerical expression for the transfer function v_o/I_g for the circuit shown. [L5][10M]

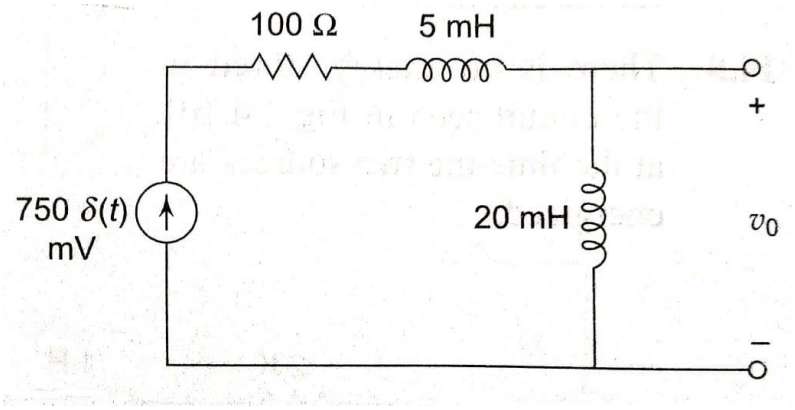


9. The unit impulse response of a circuit is

$v_o(t) = 10{,}000e^{-70t}\cos(240t + \theta)u(t)V \; Where \; tan\theta = \frac{7}{24}$

(A) Find the transfer function of the circuit. (B) Find the unit step response of the circuit. [L3][10M]

10. There is no energy stored in the circuit shown in at the time the impulse voltage is applied. Find v_o (t) for t $\geq$ 0. [L1][10M]



1.Define laplace transform. [L2][2M]
2.Define transfer function. [L2][2M]
3.Define stable system. [L2][2M]
4.Define unstable system. [L2][2M]
5.What is the laplace transform of unit step signal. [L4][2M]
6. What is the laplace transform of unit impulse signal. [L4][2M]
7.What is the impedance of pure capacitor in s domain. [L4][2M]
8. What is the impedance of pure inductor in s domain. [L4][2M]
9. What is the laplace transform of unit ramp signal. [L4][2M]
10.Laplace transform of cos2t. [L4][2M]