Register Number:……..

KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: APRIL /MAY 2024

(Regulation 2018)

Fourth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EET4004: Network and System

COURSE OUTCOMES

CO1: Understand the basic concepts of graph theory and apply it to electrical networks.
CO2: Analyze the transient behavior of DC and AC circuits.
CO3: Model the networks in S-domain and determine their equivalent two port network parameters.
CO4: Design various types of filters, attenuators and observe their frequency response.
CO5: Categorize the different types of signals and systems.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

1.	Identify the number of branches in a Tree & Co-Tree for a graph which containing 5 nodes and 8 branches.	CO1	[K_2]
2.	List the properties of a tree.	CO1	[K_1]
3.	Determine the time constant of R-L series circuit shown in Figure 1.	CO2	[K_2]

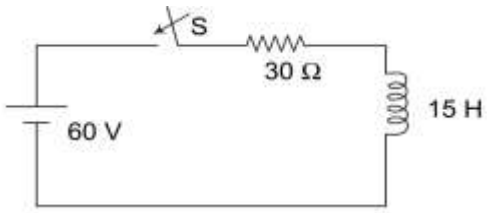

Figure 1

4.	Draw the current response of a series R-C circuit when the circuit is excited by a DC source.	CO2	[K_2]
5.	Define a two-port network.	CO3	[K_1]
6.	What is meant by Poles and Zeros of a Network Function?	CO3	[K_1]
7.	Define band pass filter.	CO4	[K_2]
8.	Solve the one Decibel into Neper.	CO4	[K_2]
9.	List the various types of discrete time signals.	CO5	[K_2]
10.	Identify when a system is said to be casual and stable.	CO5	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	If the tree of the graph shown in Figure 2 has branches 4, 5 and 6, then determine the tie-set matrix.	10	CO1	[K_3]

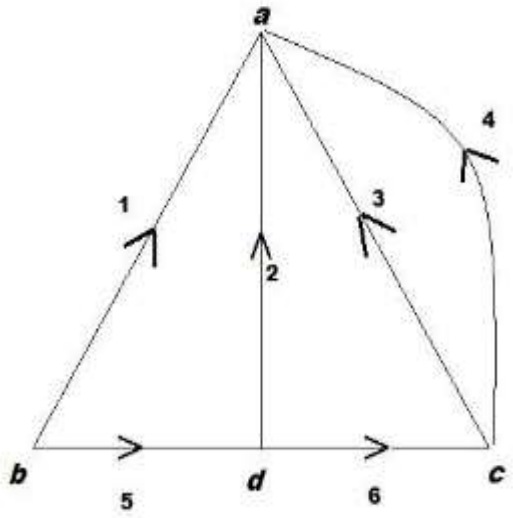

Figure 2

	b)	Mention the properties of Incidence Matrix.	6	CO1	[K_1]
12.	a)	For the network shown in Figure 3, the switch K is closed at t=0 with zero initial current in the inductor. Find the values of I, di/dt, d2i/dt2 at t=0, if R= 8Ω and L= 0.2 H.	8	CO2	[K_3]

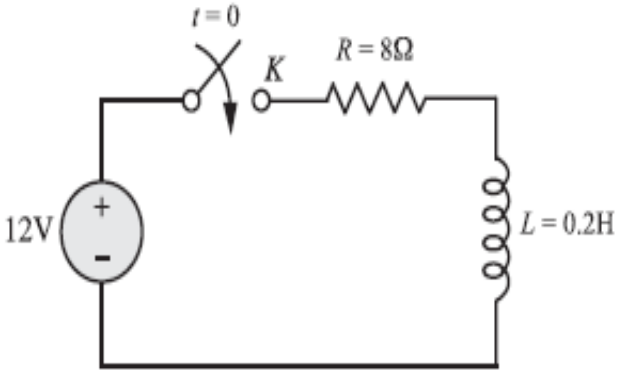

Figure 3

	b)	Derive the current equation of a series R-L circuit driven by constant DC voltage source. Draw the current response curve.	8	CO2	[K_2]
13.	a)	Determine the incidence matrix of the graph in Figure 4. Also determine the	8	CO1	[K_3]

possible number of trees for this graph.

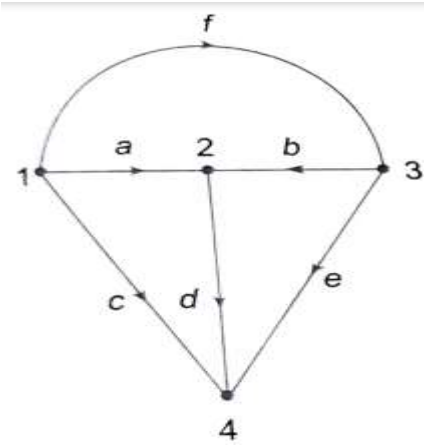

Figure 4

b) Construct the Fundamental Cut-Sets of the circuit shown in Figure 5 considering the twigs as branches with 4 ohm resistors. 8 CO1 [K3]

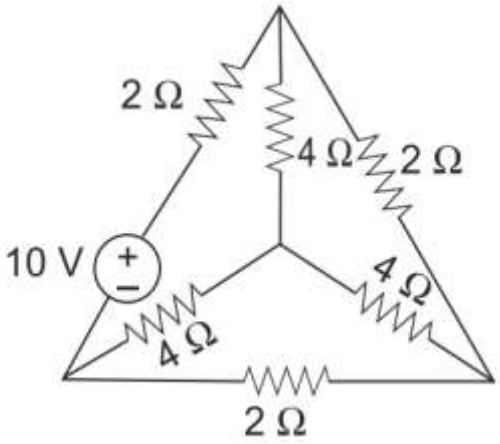

Figure 5

14. a) Determine the open circuit impedance (Z) parameters of the network shown in Figure 6. 8 CO3 [K3]

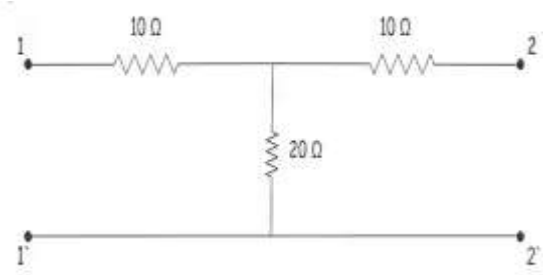

Figure 6

b) Identify the Transform Impedance & Admittance of the network shown in Figure 7. 8 CO3 [K3]

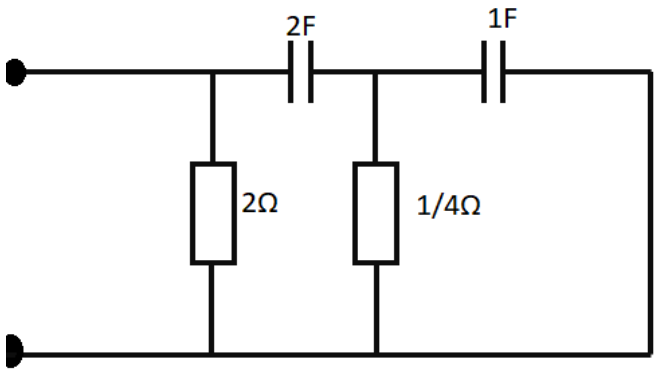

Figure 7

15.	a)	Derive the equation for characteristic impedance of a *T* filter network.	8	CO4	[K_2]
	b)	Develop the parameters of *T*-type Attenuator network.	8	CO4	[K_2]
16.	a)	Determine whether the given system is casual or non-casual. y(n)= x(n)+1/(x-1)	12	CO5	[K_3]
	b)	Illustrate the unit ramp function.	4	CO5	[K_2]

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