



R22 Regulation
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Regular Examinations, February 2024

NETWORK THEORY

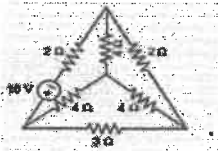
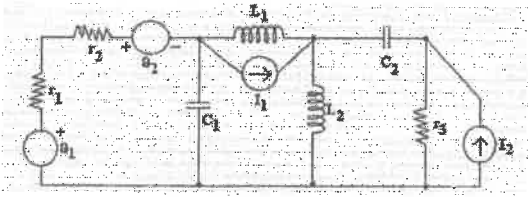
(ELECTRONICS & COMMUNICATION ENGINEERING)

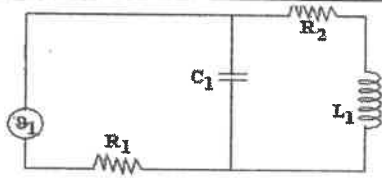
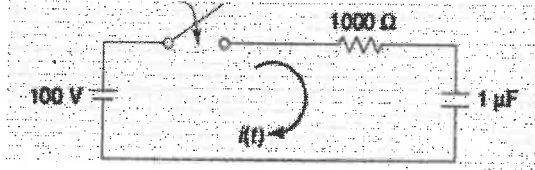
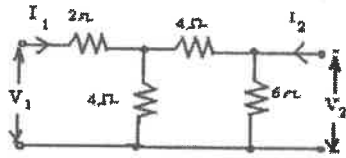
Maximum Marks: 60

Date: 21.02.2024

Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A		CO	Bloom Tx
All the following questions carry equal marks (10x1M=10 Marks)			
1.a)	Differentiate between planar and non-planar graph.	CO1	2
b)	Define link	CO1	1
c)	Define time constant.	CO1	1
d)	What is meant by steady state response?	CO1	2
e)	Why current in the inductor and voltage across the capacitor does not change Instantaneously.	CO2	2
f)	State the Laplace Transform of Sin(at).	CO2	1
g)	What is two port networks.	CO3	1
h)	Define a driving point function for an electrical network.	CO3	2
i)	What is a constant – K low pass filter.	CO4	1
j)	Define filter.	CO4	2
Part-B			
Answer All the following questions. (5X10M=50Marks)			Bloom Tx
2	A. Draw a graph and write the basic tie set matrix of the circuit shown below Figure .1. [5M]  Figure.1. B. Write a short notes on basic cutset matrix. [5M]	CO1	2
OR			
3	A. Draw the oriented graph of the network shown in Fig. 2 and write the incidence matrix. [8M]  Figure.2 B. Draw the Dual of the network shown in Figure.3. 2M	CO1	2

	 Figure.3		
4	A. Derive the expression for $i(t)$ and voltage across capacitor $V_c(t)$ for series RC circuit with D.C voltage applied to it at $t=0$. [6M] B. What are the initial conditions? why do you need them. [4M] OR	CO1	4
5	In the network of Fig.4, the switch is closed at $t=0$. With the capacitor unchanged, find value for I, di/dt and d^2i/dt^2 at $t=0+$. 10M  Figure.4.	CO1	4
6	Find $f(t)=L^{-1} [F_1(s).F_2(s)]$ by using convolution theorem for the functions. [10M] i. $F_1(S)=\frac{1}{s^2}$, $F_2(S)=\frac{1}{s+2}$ ii. $F_1(S)=\frac{1}{s(s+1)}$, $F_2(S)=\frac{1}{s^2+1}$ OR	C02	3
7	Derive the expression for series RL circuit with DC source. [10M]	CO2	3
8	Derive the expression for Z parameters of Two port network [10M]	C03	4
9	Determine the ABCD parameters of the network shown in figure .5 [10M]  Figure.5	C03	3
10	A. Design a band elimination filter having a design impedance of 600Ω and cut-off frequencies $f_1=2$ KHz and $f_2=6$ KHz. [6M] B. What are the limitations of constant -k filters. [4M] OR	CO4	4
11	Classify various types of filters in detail. [10M]	CO4	2