R22 Regulation *Subject code:4E2AG*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Regular/Supplementary Examinations, July 2025

NETWORK ANALYSIS

(EEE)

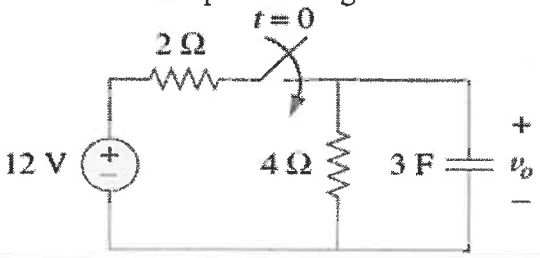
Maximum Marks: 60 Date: 11.07.2025 Duration: 3 hours

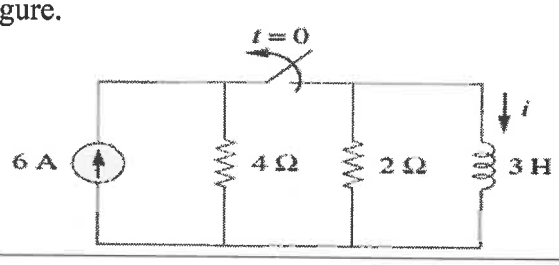
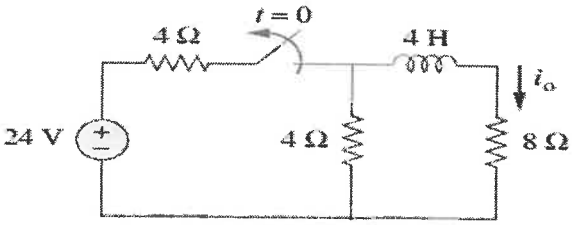
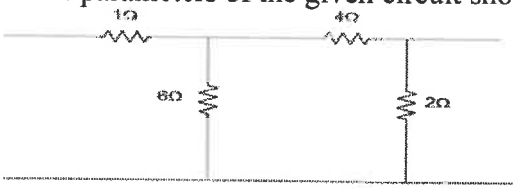
Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a	Define time constant of series R-L circuit.	1M	1	1
b	What is natural response?	1M	1	1
c	Draw and represent an exponential voltage function with magnitude V.	1M	2	2
d	Draw the voltage response curve for a Parallel R-L circuit for step current.	1M	2	2
e	What is Laplace transformation of a ramp signal having a magnitude of V.	1M	3	2
f	What is Laplace transformation of the function Sinωt?	1M	3	3
g	What is the condition for reciprocity in Z parameters?	1M	4	1
h	Which parameters are used to analyze parallel connected two-port networks.	1M	4	2
i	What is constant K filter?	1M	5	1
j	Define attenuation constant α.	1M	5	2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Derive an expression for complete response of a series R-L circuit excited by constant DC Voltage source. b) Find the expression for capacitor voltage $v_0(t)$ if the switch is closed at t=0 sec. Assume switch was open for long time. 	5M 5M	1	3
	OR			
3	Derive an expression for transient response of series R-L-C circuit for constant DC excitation. Draw the response curves.	10M	1	1

4	a) Explain transient response of parallel R-C circuit. b) Determine the expression for inductor current for t>0 sec in the circuit shown in figure. 	5M 5M	2	2
	OR			
5	Derive an expression for transient voltage of Parallel R-L-C circuit excited by step voltage.	10M	2	1
6	Define transient response. Derive an expression for transient response of series R-C circuit excited by step voltage using Laplace transformation.	10M	3	2
	OR			
7	Determine the expression for inductor current for t>0 sec in the circuit shown in figure below using Laplace transformation. Determine the time constant of the circuit. 	10M	3	4
8	a)Determine the Z parameters of the given circuit shown below  b) Express Y parameters in terms of h parameters.	5M 5M	4	3
	OR			
9	Derive an expression for overall Z parameters when two-port networks are connected in series.	10M	4	1
10	a) What is filter. Give classification of filters b) Design a constant K low pass filter with cut-off frequency of 3KHz and nominal impedance of 600Ω.	5M 5M	5	3
	OR			
11	Explain M derived low pass filter operation and design procedure.	10M	5	2