R22 Regulation *Subject code:4E3DC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, June 2026

NETWORK THEORY

(ECE)

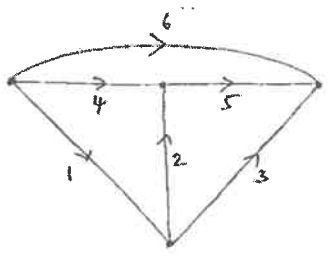
Maximum Marks: 60 Date:16.06.2026 Duration: 3 hours

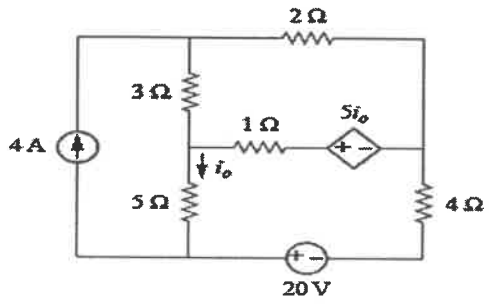
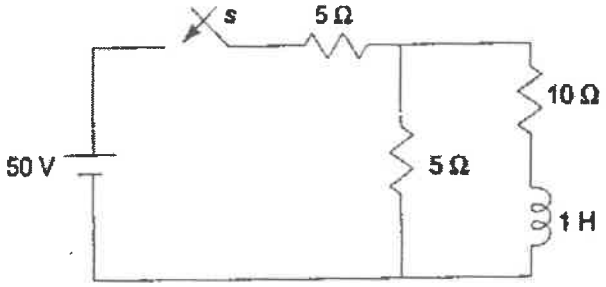
Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

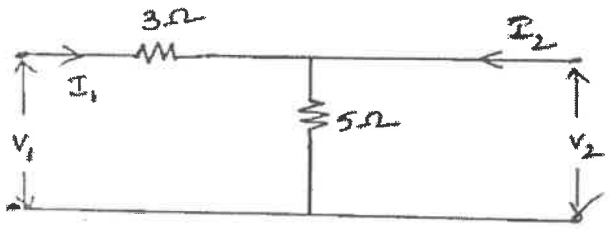
Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a)	Define a planar network.	1M	1	1
b)	If elements = 9 and nodes = 5, find the number of links.	1M	1	1
c)	Define Time constant of RL circuit.	1M	2	1
d)	Define transient state response.	1M	2	1
e)	State the Laplace Transform of unit step function $u(t)$.	1M	3	1
f)	Define two port network.	1M	3	1
g)	State one application of ABCD parameters in practical circuits.	1M	4	1
h)	Define a driving point function for an electrical network.	1M	4	1
i)	Where is a band rejection filter used in real life?	1M	5	1
j)	How are network functions used in filter design?	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Write short notes on Incidence matrix of a given network shown in fig.  Fig.	10M	1	2
	OR			

3	Draw a suitable tree and dual network for the following network. Use general loop analysis to find i0 in the circuit shown in Fig  Fig.	10M	1	2
4	a) Derive the transient response of series RL circuit. b) The circuit consisting of resistance R=0.5MΩ, inductance L= 10mH and capacitance C=8μF and a current source of 1mA, all connected in parallel. Obtain an expression for the voltage across the inductance at an instant t=12sec.	5M 5M	2	2
	OR			
5	For the circuit shown in fig determine the current in 10Ω when the switch is closed at t=0.  Fig.	10M	2	2
6	a) Find the inverse Laplace Transform of: $$F(s) = \frac{4}{s^2(s+3)}$$	10M	3	2
	OR			
7	Derive the expressions for current, voltage across inductor and voltage across resistor for series RL circuit.	10M	3	2
8	Derive expression for Y-Parameters of two port network.	10M	4	2
	OR			

9	Find the Z-parameters for the network shown below fig.  Fig.	10M	4	2
10	a) Derive the design equations of m-derived low pass filter for Π-section, from which design a low pass filter with Ro =800Ω, fc =1.6Khz and f∞ =2.5Khz. b) Draw the characteristics of LPF and BPF.	6M 4M	5	2
	OR			
11	Explain the different types of filters with charateristics.	10M	5	2