

Nov – Dec 2025

Program: B. Tech_Scheme III

Regular Examination: SY Semester: III

Course Code:EXC305_and Course Name: Electrical Network Theory

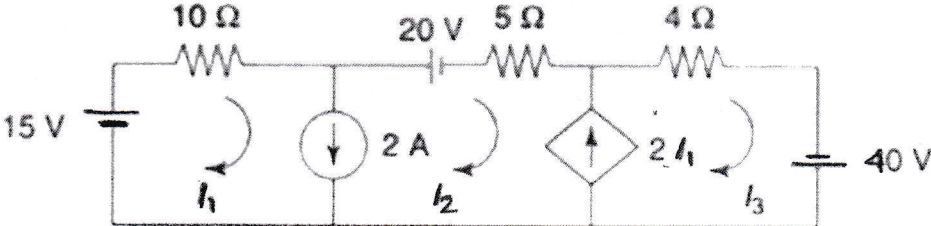
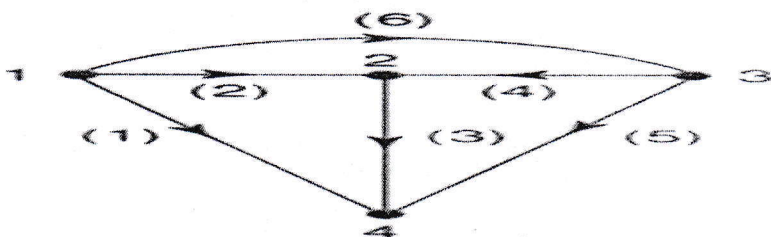
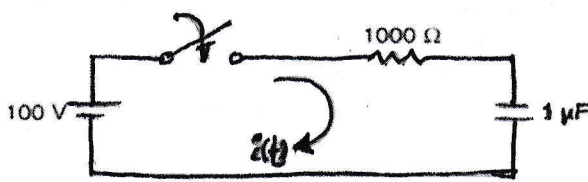
Date of Exam: 4/12/25

Duration: 02.5 Hours

Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	For the network shown in Fig. , compute the current through the 10Ω resistor by mesh analysis 		1	Ap
b)	Compute complete Incidence matrix and reduced Incidence matrix from the given graph 		2	Ap
c)	In the given network of Fig., the switch is closed at $t=0$. With the capacitor un-charged, find value for i, di/dt at $t=0^+$. 		3	Ap

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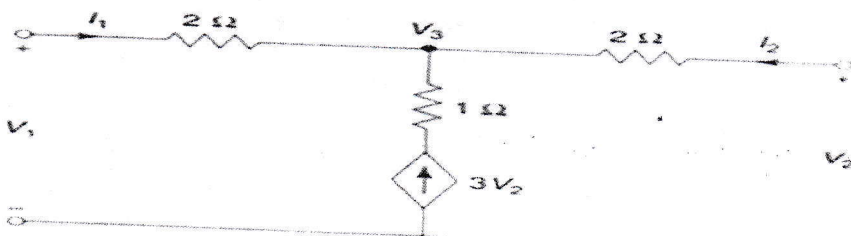
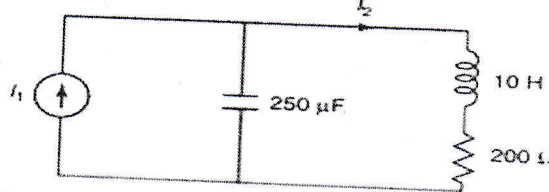
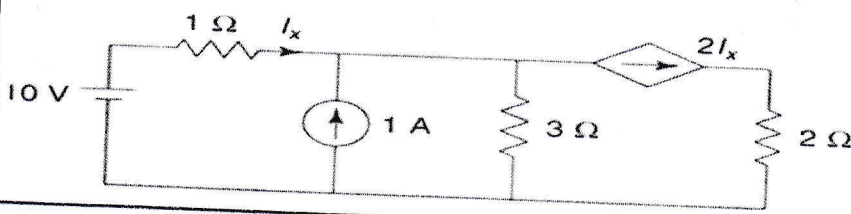
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Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Find Y_{11} and Y_{12} parameter of given network.		4	Ap
				
b)	Draw the pole-zero diagram of I_2 / I_1 for the network shown in Fig	5	Ap	
				
c)	Test whether following function is positive real function or not $F(s) = \frac{s^3 + 5s}{s^4 + 2s^2 + 1}$	6	Ap	
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Find the current in the $2\ \Omega$ resistor by Norton theorem in the network of Fig.		1	Ap
				
b)	Calculate the Y and Z-parameters for the network shown in Fig	4	Ap	

Seat No.:

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c)	For the network shown in Fig Find the voltage transfer function $V_2/V_1, V_1/I_1, V_2/I_1$..	5	Ap
Q.4	Solve any two questions out of three. (10 marks each)	20	
a)	For the graph shown in Fig. compute the complete incidence matrix reduced incidence matrix, tieset matrix and f-cutset matrix	2	Ap
b)	In the network shown in Fig. the switch is changed from position 1 to the position 2 at $t = 0$, steady condition having reached before switching. Find the values of $i, di/dt, d^2i/dt^2$ at $t=0^+$.	3	Ap
c)	i) Test whether $F(s) = (s^2+1)/(s^3+4s)$ is a positive real function ii) Test whether $F(s) = (s+3)/(s+1)$ is a positive real function.	6	Ap
