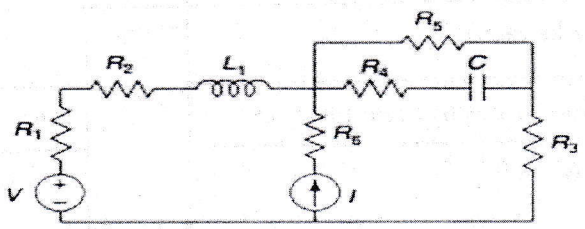
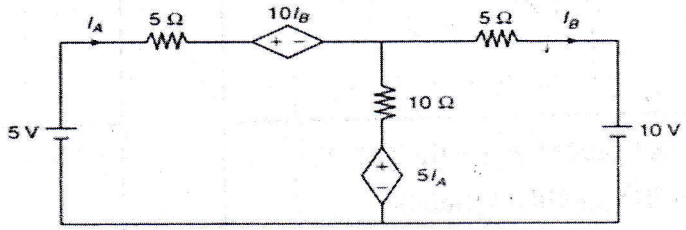
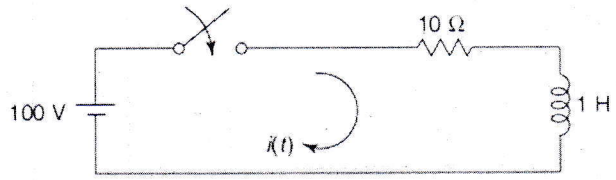
K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2025
Program: B. Tech _Scheme III
Supplementary Examination: SY Semester: III
Course Code:EXC305_and Course Name:Electrical Network Theory
Date of Exam: 7-2-26 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 circuit shown in Fig., draw the oriented graph and write the incidence matrix. 		2	Ap
b)	Obtain the branch currents in the network shown in Fig. 		1	Ap
c)	In the given network of Fig. , the switch is closed at t =0. With zero current in the inductor, find i(t) at t = 0+ 		3	Ap

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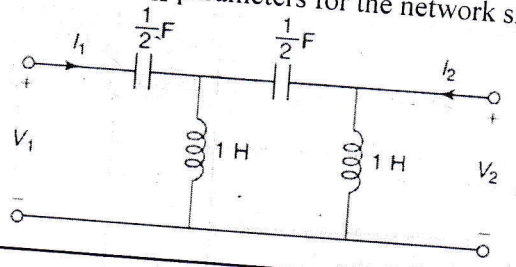
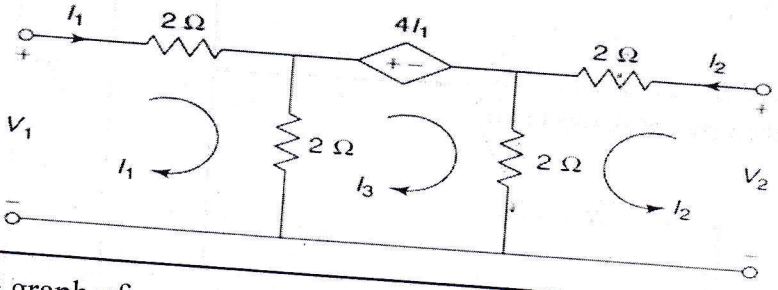
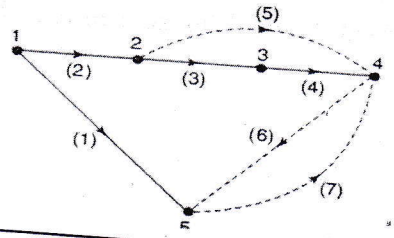
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	What are the properties of Positive Real Functions		6	U,R
b)	Find h_{11} and h_{12} parameters for the network shown in Fig. 		4	Ap
c)	Test whether the polynomial P (s)= S3+4S2+ 5S+2 is Hurwitz		5	Ap
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Test whether F (s) = S(S+3)(S+5) / (S+1)(S+4) is positive real function.		6	Ap
b)	Find Z and h-parameters for the network shown in Fig. 		4	Ap
c)	The graph of a network is shown in Figure. Write the (a) incidence matrix, and (b) tieset matrix c) cutset matrix 		2	Ap
Q.4	Solve any **two** questions out of three. (10 marks each)	20		

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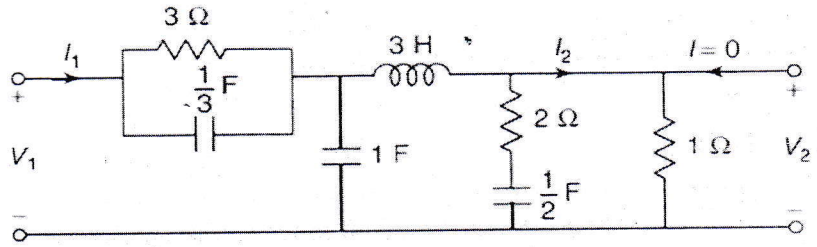
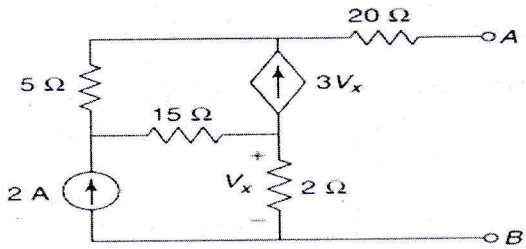
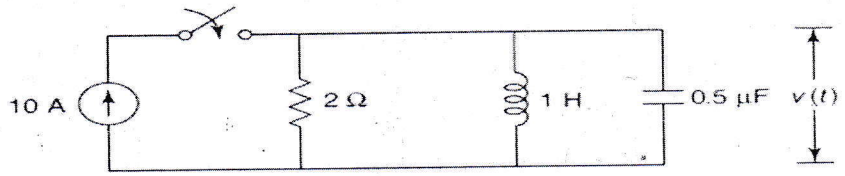
a)	Determine the voltage ratio V_2/V_1, current ratio I_2/I_1, transfer impedance V_2/I_1 and driving- point impedance V1/I1 for the network shown in Fig. 		5	Ap
b)	For the network shown in Fig. find Norton's equivalent network 		1	Ap
c)	In the network , the switch is closed at t = 0. With the capacitor uncharged, find value for v , dv/dt , d^2v/dt^2 at t = 0+ 		3	Ap

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