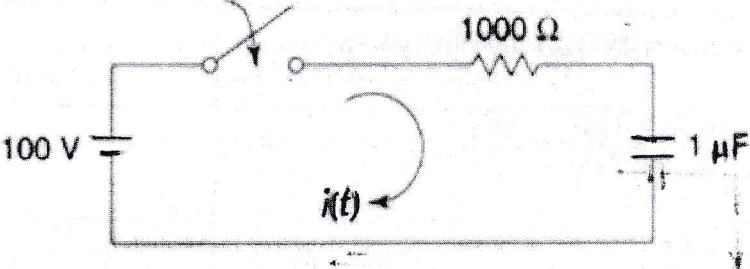
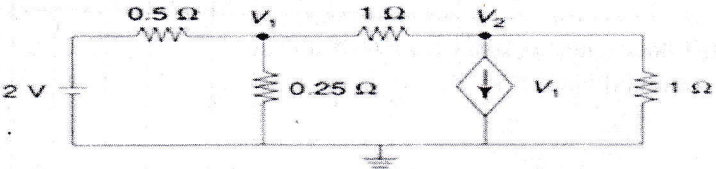


K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2025		
Program: B.Tech Scheme II/IIB		
Regular/Supplementary Examination: SY Semester: III		
Course Code:EXC 305 and Course Name: Electrical Network Theory		
Date of Exam: <u>4/12/25</u>	Duration: 02 Hours	Max. Marks: 45

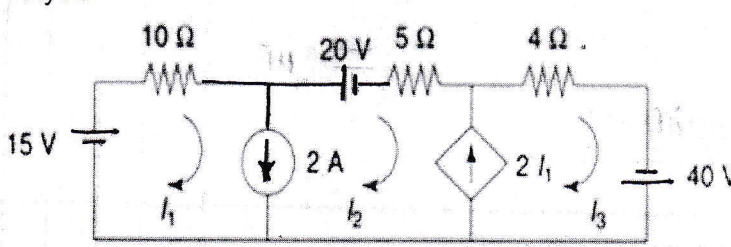
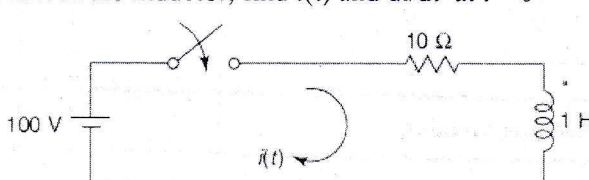
Instructions:

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

		Max. Marks	CO	BT level
Q 1	Solve any 5 questions out of six.	15		
i)	In the network, the switch is closed at $t = 0$. assuming all initial conditions as zero,, Compute value for $i(t)$ at $t = 0+$ 		3	Ap
ii)	Define Z,Y,ABCD parameters with equations		4	U,R
iii)	State three properties of Hurwitz polynomial		5	U,R
iv)	Obtain the V_1 for the given network of Fig. 		1	Ap
v)	State any three properties of Positive real function		6	U,R

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vi)	Draw the oriented graph from the complete incidence matrix given below <table><tr><th>Nodes ↓</th><th colspan="6">Branches →</th></tr><tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr><tr><th>1</th><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><th>2</th><td>0</td><td>-1</td><td>1</td><td>-1</td><td>0</td><td>0</td></tr><tr><th>3</th><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>-1</td></tr><tr><th>4</th><td>-1</td><td>0</td><td>-1</td><td>0</td><td>-1</td><td>0</td></tr></table>	Nodes ↓	Branches →							1	2	3	4	5	6	1	1	1	0	0	0	1	2	0	-1	1	-1	0	0	3	0	0	0	1	1	-1	4	-1	0	-1	0	-1	0		2	Ap
Nodes ↓	Branches →																																													
	1	2	3	4	5	6																																								
1	1	1	0	0	0	1																																								
2	0	-1	1	-1	0	0																																								
3	0	0	0	1	1	-1																																								
4	-1	0	-1	0	-1	0																																								
Q.2	Solve any three questions out of four.	15																																												
i)	Compute the current through the 10Ω resistor by mesh analysis 		1	Ap																																										
ii)	Test whether following function is positive real function or not $F(s) = \frac{s^2 + 4}{s^3 + 3s^2 + 3s + 1}$		6	Ap																																										
iii)	In the given network of Fig., the switch is closed at t = 0. With zero current in the inductor, find i(t) and di/dt at t = 0+ 		3	Ap																																										

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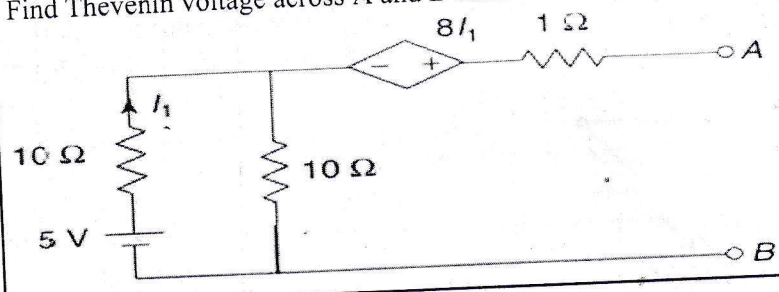
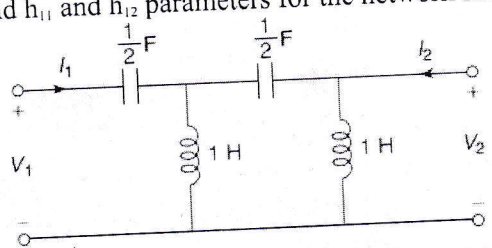
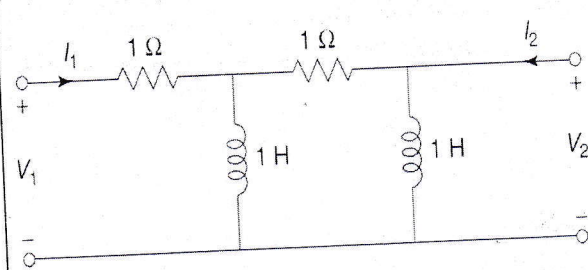
Regular/Supplementary Examination: SY Semester: III

Course Code: EXC 305 and Course Name: Electrical Network Theory

Duration: 02 Hours

Max. Marks: 45

Date of Exam: 11/11/25

iv)	Find Thevenin voltage across A and B terminal shown in fig. 		1	Ap
Q.3	Solve any three questions out of four.	15		
i)	Test whether the polynomial $P(s) = s^4 + s^3 + 3s^2 + 2s + 12$ is Hurwitz by continued fraction expansion.		5	Ap
ii)	Find h_{11} and h_{12} parameters for the network shown in Fig. 		4	Ap
iii)	Determine Z_{11} and Z_{12} parameters for the network shown in Fig 		4	Ap

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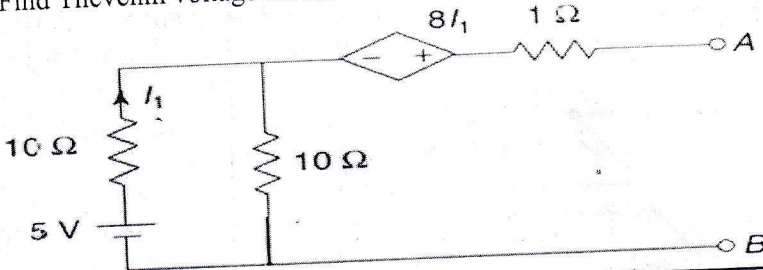
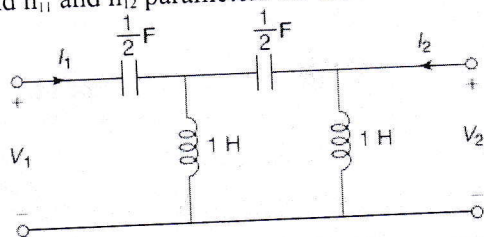
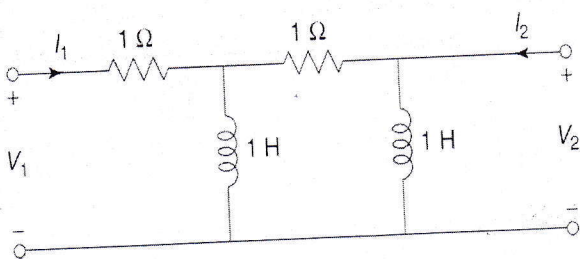
Regular/Supplementary Examination: SY Semester: III

Course Code: EXC 305 and Course Name: Electrical Network Theory

Date of Exam: 11/11/25

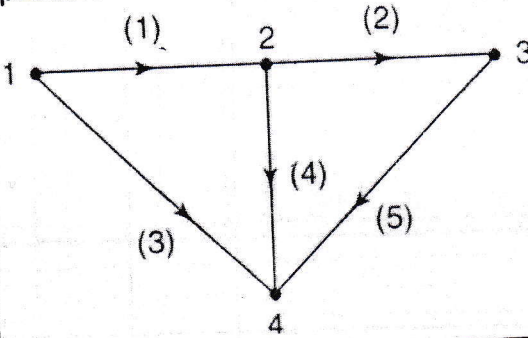
Duration: 02 Hours

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Date of Exam: 04-12-2025	Duration: 02 Hours Max. Marks: 45

iv)	Obtain complete incidence matrix and any two numbers of possible trees for this graph? 		2	Ap
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