R22

ANURAG Engineering College
(An Autonomous Institution)
### II B.Tech I Semester Supplementary Examinations, June/July – 2024
NETWORK ANALYSIS AND SYNTHESIS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours   **Max. Marks: 60**

Section – A (Short Answer type questions)   (10 Marks)

Answer All Questions

		Course Outcome	B.T Level	Marks
1.	Define the Mutual-inductance of magnetic circuit.	CO1	L1	1M
2.	Define the terms trees and links for network graph theory.	CO1	L1	1M
3.	Define the quality factor of resonance circuit.	CO2	L1	1M
4.	Write the differences between series and parallel resonance	CO2	L1	1M
5.	Why ABCD-parameter are called as transmission line parameters?	CO3	L2	1M
6.	What is a two port network?	CO3	L1	1M
7.	Define the lattice section?	CO4	L1	1M
8.	When lattice section can be called as Symmetrical or Asymmetrical lattice	CO4	L2	1M
9.	Define the transfer impedance and admittance.	CO5	L1	1M
10.	Differentiate between network analysis and network synthesis.	CO5	L2	1M

Section B (Essay Questions)
Answer all questions, each question carries equal marks.   (5 X 10M = 50M)

				Course Outcome	B.T Level	Marks
11.	A)	i)	Two coils having self-inductances of 4mH and 7mH respectively are connected in parallel. If the mutual inductance between them is 5mH, find the equivalent inductance.	CO1	L3	5M
		ii)	Explain the condition for ideal transformer.		L2	5M
			OR			
	B)	i)	Explain the dot convention rule for coupled circuit.	CO1	L2	5M
		ii)	What is coupling coefficient? Derive the expression for it			5M
12.	A)		Determine whether the RLC series circuit shown in Fig. Under damped, over damped or critically damped. Also find $V_L(0^+)$, di/dt and $i(\infty)$.	CO2	L2	10M
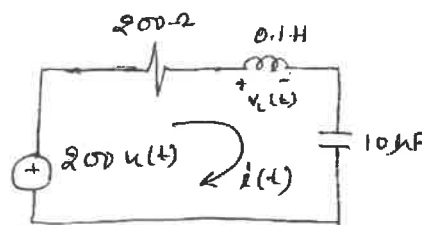
			OR			
	B)	i)	Derive the step response of RL circuit in s-domain.	CO2	L3	5M
		ii)	A series connected circuit has R = 4 Ω and L = 25 mH.			5M
			a) Calculate the value of C that will produce a quality factor of 50.			
			b) Find ω1, ω2 and bandwidth.			

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13. A)	A two port network has the Z-parameter $Z_{11} = 200\ \Omega$, $Z_{22} = 30\ \Omega$ and $Z_{12} = Z_{21} = 40\ \Omega$ then find the ABCD parameter and h-parameter.	CO3	L3	10M

OR

B)	Explain about the parameters used for series connected two port network.	CO3	L3	10M

14. A)	Explain the classification of pass band and stop band Filter.	CO4	L3	10M

OR

B)	Fine the cut-off frequency for an RC low pass filter of R=8.2 Ω and $0.0033\mu F$.	CO4	L2	10M

15. A)	For the ladder network of the figure, obtain the transfer resistance as expressed by the ratio of V_{in} to i_4.	CO5	L3	10M
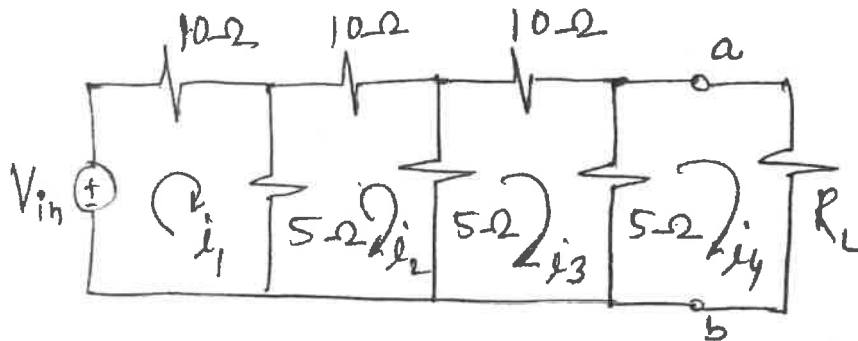
OR

B)	Two circuit, the impedance are which given by $Z_1 = (4 + j3)\Omega$ and $Z_2 = (8 - j6)\Omega$ are connected in parallel. If the total current supplied is 15A, what is the value of total admittance of the circuit?	CO5	L3	10M