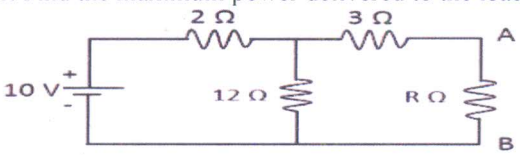
PAPER ID : 15810
Name of Programme /Course : B.Tech
Examination: : December- 2024
Semester : 3rd
Name of Subject : NETWORK ANALYSIS AND SYNTHESIS

Time: 3 Hours **Maximum Marks: 100**

Instructions:

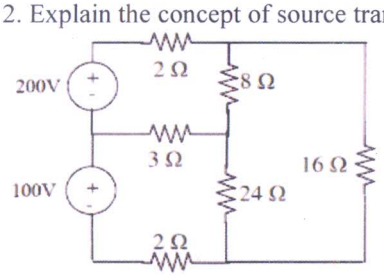
- **Question no 1 is COMPULSORY consisting of seven questions carrying 2 marks each. Question no 2 to 9 carrying 14 marks each**
- **You have to attempt five questions in total, first being compulsory and selecting one from each Unit.**

Q.No.	Questions	Marks
Q. 1	1. Calculate the fourier transform for the signal $x(t) = t^2 e^T u(t)$	14
	2. Derive the expression for transfer function of a high pass filter and plot the curve.	
	3. Define Transfer function.	
	4. Define Network Analysis and Network Synthesis.	
	5. Write the symmetry condition for ABCD parameters.	
	6. Define time constant for an RC, RL and RLC circuit.	
	7. Explain Tallegen's theorem.	
	UNIT 1	(10 +4)
Q. 2	1. Find the maximum power delivered to the load by using maximum power transfer theorem for the following circuit.	



2. Explain the concept of source transformation?

Q. 3 14



Using nodal analysis find all branch currents for the following circuit.

UNIT 2 (7

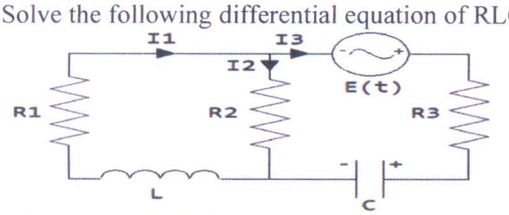
Q. 4 1. Find out the fourier transform of $x(t) = e^{-at}u(t)$. Also draw the magnitude and phase spectrum of the output. +7)

2. Demonstrate and prove the frequency convolution and time differentiation property of fourier transform.

Q. 5 Explain three phase unbalanced circuit and their power calculation. 14

UNIT 3 14

Q. 6 Solve the following differential equation of RLC circuit using Laplace transform



Q. 7 1. In a series RLC circuit excited by a voltage $3e^{-t}$ u (t), the resistance is equal to 1 Ω and capacitance = 2 F. For the circuit, the values of I (0^+) and I (∞) (7 +7)

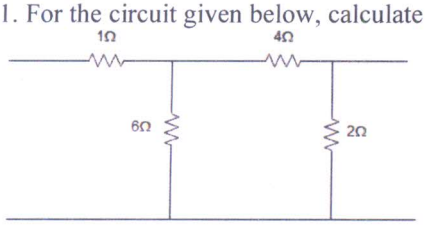
2. What is the Laplace transform of a voltage v(t) is $V(S) = (S+6) / (S+2)(S+4)$

UNIT 4 (7

Q. 8 1. What is a two port parameter? Explain their types with details. Represent T- parameters in terms of Z parameters. +7)

2. What is band pass, low pass, high pass and band reject filters.

Q. 9 1. For the circuit given below, calculate the value of the z parameter. (10 +4)



2. For the circuit given below, calculate the value of z_{22} parameter.

