

Code No: 153BH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year I Semester Examinations, March - 2022

NETWORK ANALYSIS AND TRANSMISSION LINES

(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

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1. Explain the following terms:

a) Graph of a network	b) Oriented Graph	c) Rank of a Graph
d) Planar and non-planar graph and	e) Subgraph.	[15]
2. Calculate the currents I_1 and I_2 for the following circuit shown in figure 1. [15]

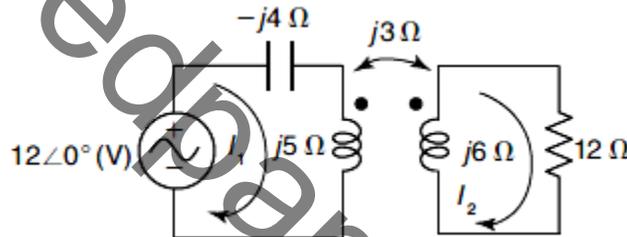


Figure: 1

- 3.a) Prove that the active power consumed in any purely reactive circuit is zero.

b) For the following network shown in figure 2, a steady state is reached with switch open. At $t = 0$, switch is closed. Find the three loop currents at $t = 0^+$. [6+9]

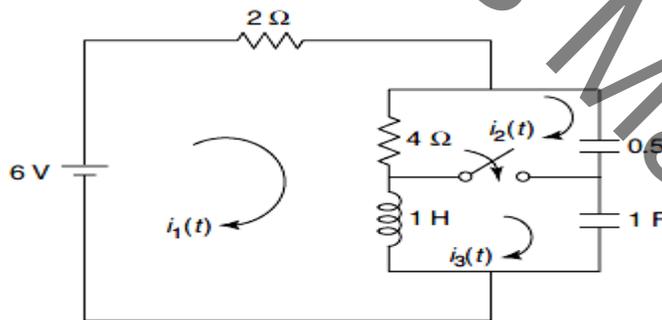


Figure: 2

4. For the circuit shown in figure 3, find $i_1(t)$ for $\omega = 100$ rad / sec. [15]

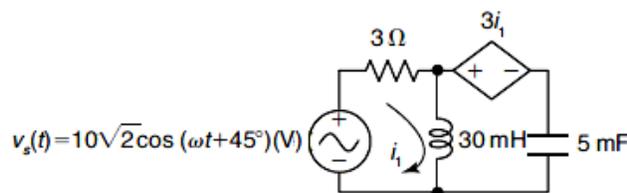


Figure: 3

- 5.a) Explain the condition for symmetry in a two port network with a proper example.
 b) For the following network shown in figure 4, find the Y – parameters. [6+9]

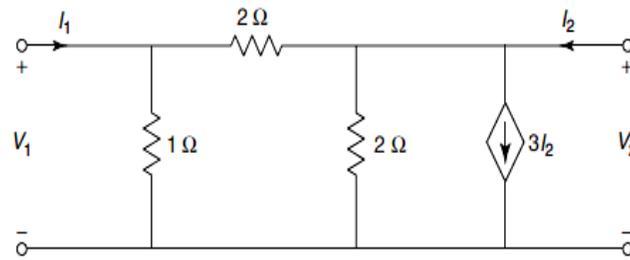


Figure: 4

6. What are image parameters? Derive expression of image parameters in terms of:
 a) ABCD parameters
 b) open-circuit and short-circuit impedances. [7+8]
7. The values of primary constants of an open-wire line per km are $R = 10 \Omega$, $L = 3.5 \text{ mH}$, $C = 0.008 \mu\text{F}$ and $G = 0.7 \mu\text{S}$. For a signal frequency of 1000 Hz, calculate the characteristic impedance, Propagation constant, attenuation constant, phase constant, wavelength and phase velocity v_p . [15]
- 8.a) List and explain the characteristics of impedance smith chart.
 b) Explain the significance and design of single stub impedance matching and discuss the factors on which stub length depends. [7+8]

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