Code No: 153BH **R18**

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

---

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]

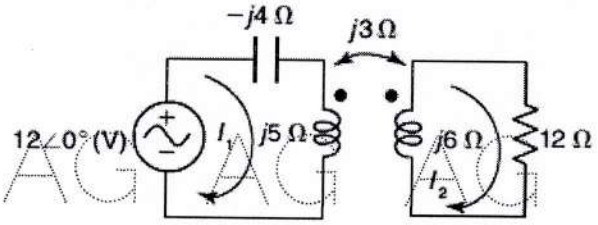

Figure: 1

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]

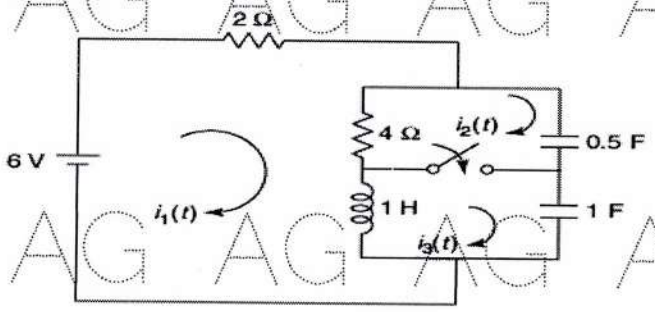

Figure: 2

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

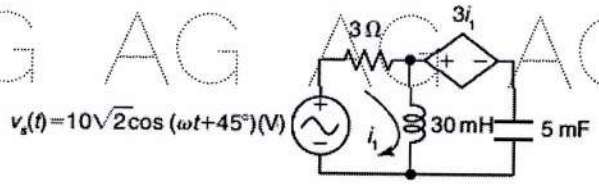

Figure: 3

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]

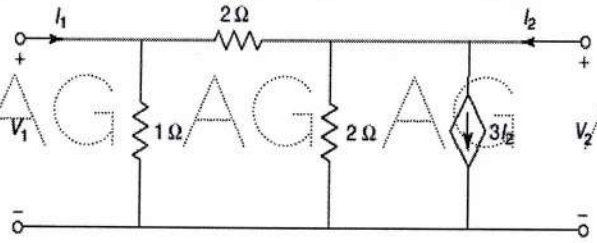

Figure: 4

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 Ω, L = 3.5 mH, C = 0.008 μF and G = 0.7 μ℧. 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]

---ooOoo---