No. of Printed Pages : 4

**BIEE-014**

# B.TECH. - VIEP-ELECTRICAL ENGINEERING

01185

## Term-End Examination

## June, 2012

## BIEE-014 : NETWORK THEORY

*Time : 3 hours* *Maximum Marks : 70*

***Note :*** *(i) Attempt **any seven** questions.*

*(ii) All questions carry **equal** marks.*

*(iii) All the questions are to be answered in English language only.*

**1.** Draw the network graph of the network shown in fig. (1) and reduce it in the simplest form eliminating temporary nodes. Divide the reduced network graph into connected subgraphs eliminating minimum number of element. **10**

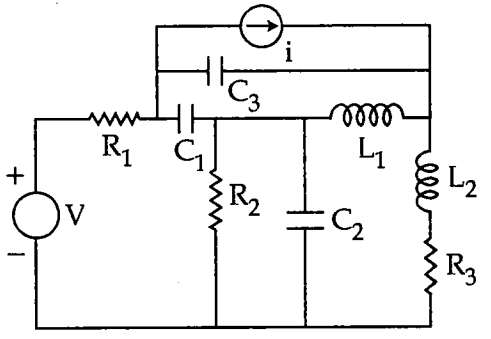


Fig. (1)

2. (a) Draw the dual of the network shown in fig. (2) : 5

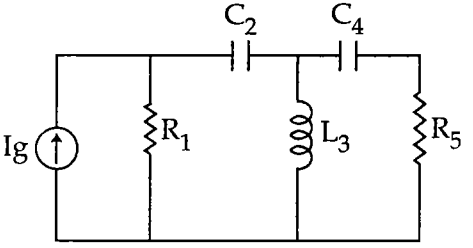


Fig. (2)

(b) A reduced incidence matrix of the graph is given by : 5

$$[A] = \begin{bmatrix} 1 & 1 & 0 & 0 & 0 & 1 \\ 0 & -1 & 1 & -1 & 0 & 0 \\ -1 & 0 & -1 & 0 & -1 & 0 \end{bmatrix}$$

obtain the number of possible trees.

3. State and verify the reciprocity theorem with the help of a suitable example and also write its limitations. 10

4. In the circuit shown in fig. (3) two voltage sources act on the load impedance connected to terminals AB. If the load is variable in both reactance and resistance, what load $Z_L$ will receive maximum power. Applying Millman's theorem. Also calculate maximum power. 10

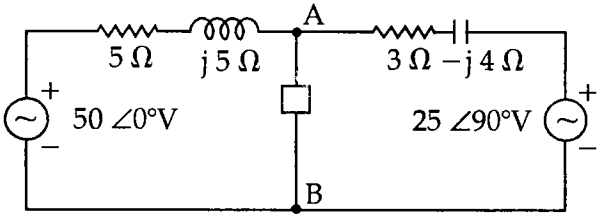


Fig. (3)

5. In the network of figure (4) draw pole-zero plot : **10**

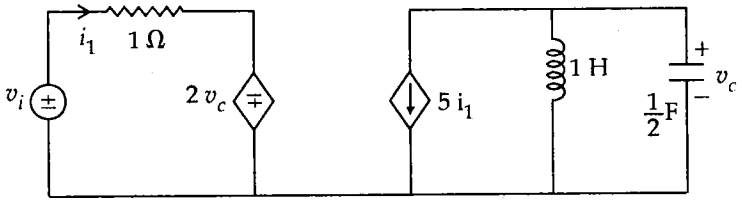


Fig. (4)

6. (a) Explain the concept of complex frequency. **5**

(b) Write the necessary condition for driving point immittance functions. **5**

7. Derive the condition for reciprocity and symmetry in case of : **10**

(a) T - parameter

(b) H - parameter

8. Show that the overall transmission parameter matrix for cascaded two 2-port networks is simply the matrix products of transmission parameters for each individual 2-port network in cascade. **10**

9. Realize the function, **10**

$$Z(s) = \frac{s(s^2 + 4)}{2(s^2 + 1)(s^2 + 9)}$$

in both foster form LC network.

10. Write the short notes on ***any two*** of the following : **5x2=10**

(a) Low Pass Filter

(b) Stability on basis of pole-zero plot

(c) Transfer function