No. of Printed Pages : 3

BIEE-014

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

December, 2016

00753

BIEE-014 : NETWORK THEORY

Time : 3 hours *Maximum Marks : 70*

Note :

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

(ii) *Each question carries 10 marks.*

(iii) *Use of scientific calculator is allowed.*

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1. Determine all the trees and corresponding co-trees for the graph of the network shown in Figure 1. Using the tree formed by branches (1, 2, 5), write the incidence matrix. *10*

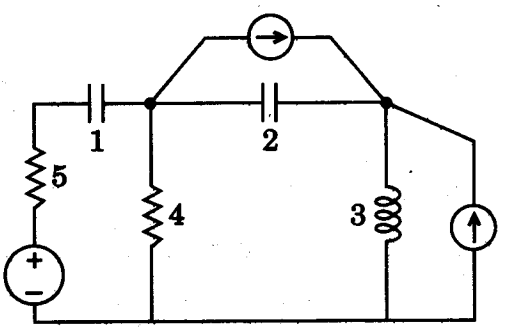

Figure 1

2. State maximum power transfer theorem. Derive the condition for maximum power transfer in an AC circuit. Also derive the expression for power dissipated in the load. *10*

3. Given the network of Figure 2, find Norton's equivalent circuit at terminals a – b. *10*

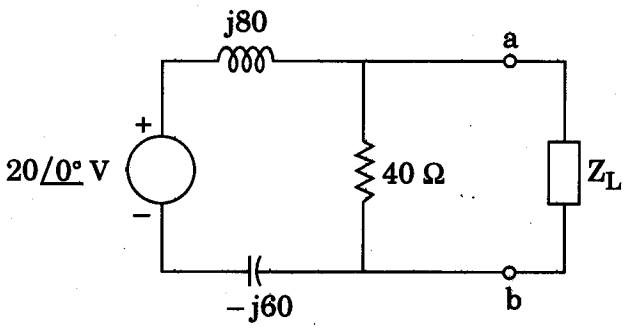

Figure 2

4. Determine the z and y-parameters of the network in Figure 3. *10*

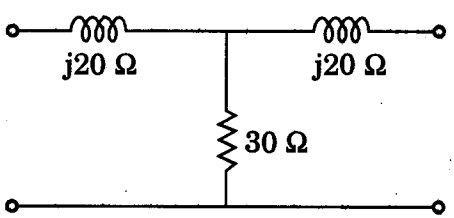

Figure 3

5. Explain, how a transmission line can be represented as T and π networks. Also enumerate T to π transformation. *10*

6. Synthesize the first and second Cauer forms of the LC driving point impedance function

$$Z_D(s) = \frac{(s^2 + 1)(s^2 + 16)}{s(s^2 + 4)}.$$ *10*

7. Prove that positive real functions represent physically realizable passive driving point immittances. Also explain the properties of positive real functions. *10*

8. Define characteristic impedance of filter networks. Derive the expression for characteristic impedance for T-network filter. *10*

9. Write short notes on any ***two*** of the following : *2×5=10*

   (a) Superposition Theorem for AC Networks

   (b) Lattice Networks

   (c) Active Filters