No. of Printed Pages : 4 | **BIEE-014**

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)
Term-End Examination
December, 2015

BIEE-014 : NETWORK THEORY

Time : 3 hours   *Maximum Marks : 70*

Note :

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

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

(iii)   *Missing data, if any, may be suitably used.*

1. (a) Explain the following terms with their main difference :   *6*
   (i) Mesh and Loop
   (ii) Cell and Battery
   (iii) Tree and Co-tree

   (b) Draw the graph of the network shown in Figure 1. Select a suitable tree to write tie-set schedule. Hence find the three loop currents.   *8*
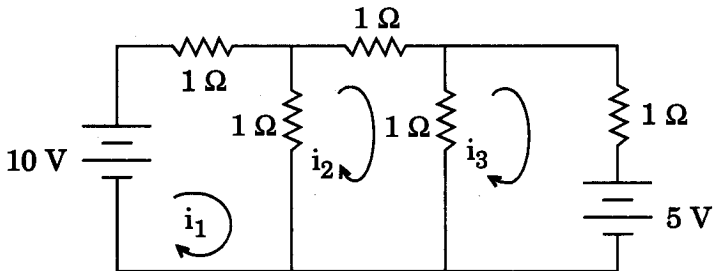
Figure 1

2. (a) Derive an expression for maximum power transfer theorem for an a.c. circuit. *10*

(b) In the network shown in Figure 2, two voltage sources act on the load Z_L. If the load is variable, for what value will the load Z_L receive maximum power? *4*
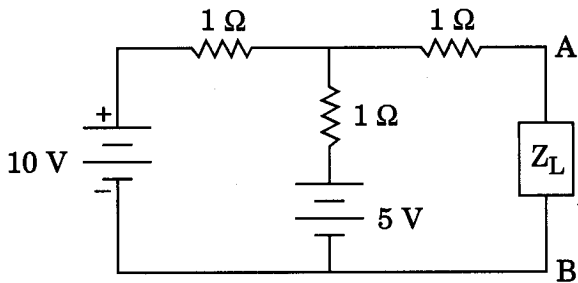

Figure 2

3. (a) State and prove Millman's Theorem. Write about its application in electrical engineering. *7*

(b) Using source conversion, find the equivalent voltage across the load terminals in the network shown below in Figure 3. *7*
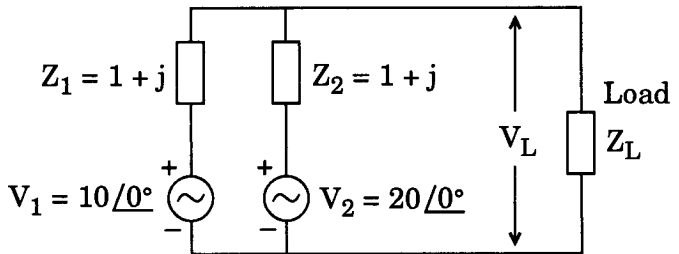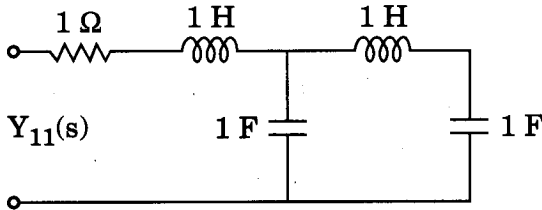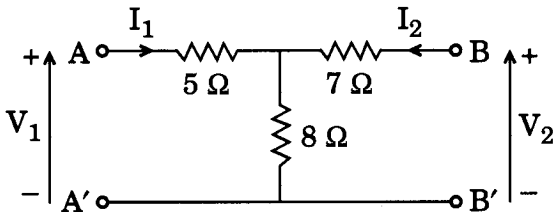

Figure 3

4. (a) What is driving point admittance ? Determine the driving point admittance $Y_{11}(s)$ of the network shown in Figure 4.   7

Figure 4

(b) What are poles and zeros ? Give the restrictions on pole and zero location in transfer functions.   7

5. (a) Derive the condition of reciprocity for ABCD parameters.   7

(b) Derive the condition for symmetrical network for Y parameter.   7

6. (a) Check whether the network shown in Figure 5 is reciprocal or not.   7

Figure 5

(b) Realise the following RC driving point impedance function in Foster-II form : 7

$$z(s) = \frac{(s^2 + 4s + 3)}{(s^2 + 2s)}$$

7. Write short notes on any *two* of the following :

$2 \times 7 = 14$

(a) High Pass Filter

(b) Positive Real Function

(c) Active and Passive Filters

————