No. of Printed Pages : **3**

BIEE-014

00085

B.TECH. - VIEP-ELECTRICAL ENGINEERING

Term-End Examination

June, 2013

BIEE-014 : NETWORK THEORY

Time : 3 hours *Maximum Marks : 70*

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

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

---

1. (a) Find current I_N for the network shown in fig - 1 using graph theory. 7

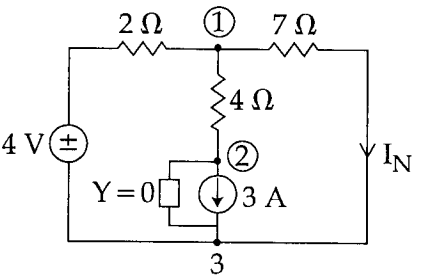

Fig. 1

(b) Draw the dual of the network as shown in fig - 2. 7

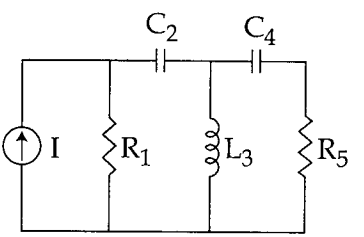

Fig. 2

2. (a) Determine current in the capacitor branch by using super position theorem in the circuit shown in fig - 3. 7

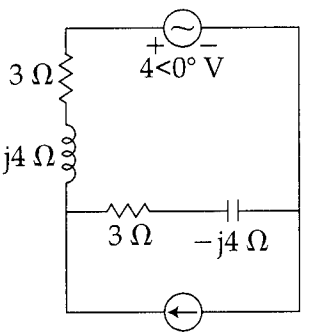

Fig. 3

(b) State and prove Tellegen's Theorem. 7

3. (a) Find transfer impedance function $Z_{21}(s) = \frac{V_2(s)}{I_1(s)}$ of the network shown in fig - 4. 7

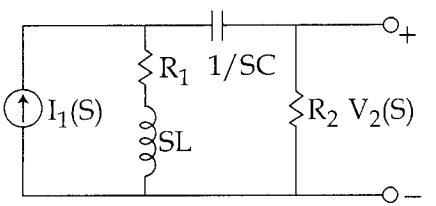

Fig. 4

(b) Explain various properties and necessary conditions for transfer functions. 7

4. (a) Derive the condition for reciprocity and symmetry in case of T - parameters. 7

(b) Show that when two networks N_1 and N_2 are connected in parallel, the equivalent Y - parameters of combined network is the sum of Y parameters of each individual 2 port network. 7

5. (a) Test whether following function is a positive real function or not. 7

$$F(s) = \frac{S^3 + S^3 + 3S + S}{S^2 + 6S + 8}.$$

(b) Synthesise the given impedance function in Caner - I form 7

$$Z(s) = \frac{S(S+2)(S+5)}{(S+1)(S+4)}.$$

6. (a) Design a Low pass filter having a cut - off frequency of 1kHz to operate with a terminated load resistance of 200 Ω. 7

(b) What are the limitations of passive filters ? Enlist some of the advantages of active filters. 7

7. Write short notes on **any three** of following : 5, 5, 4

(a) Reciprocity Theorem

(b) Routh Hurwitz stability criterion

(c) Image parameters and characteristics impedance

(d) Positive real functions

(e) Constant K Type High pass filter.