S.E-Sem 3 (CBGS) (EXTC).
CTL

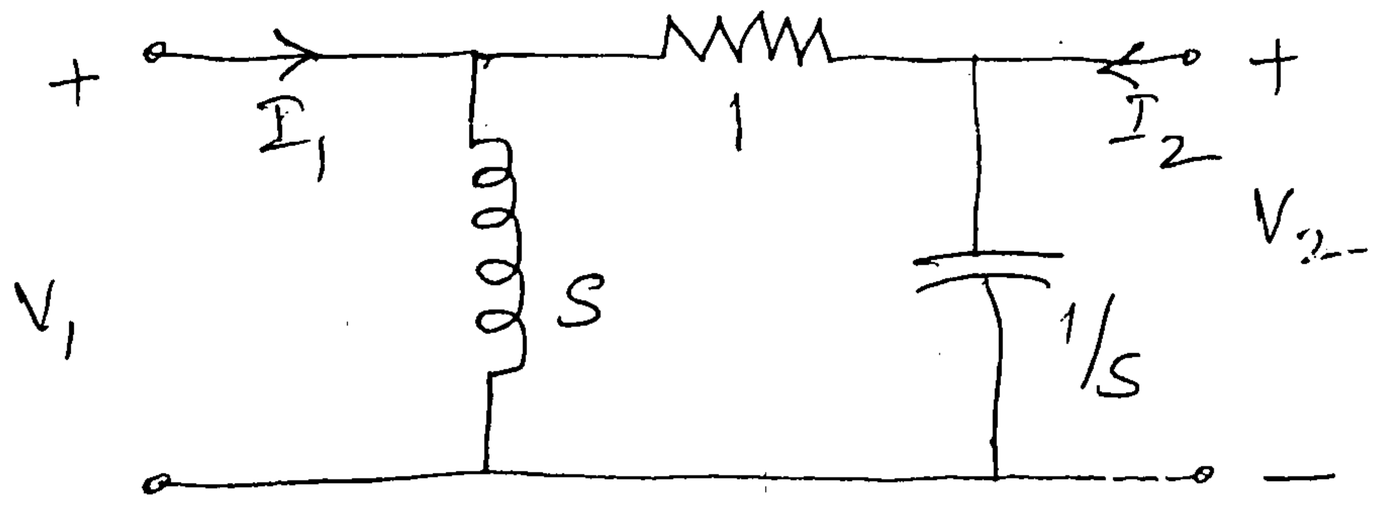
5/6/15.

QP Code : 4898

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question no. **1** is **compulsory**.
(2) Attempt **any three** questions from **remaining** questions.
(3) Figures to the right indicate full marks.
(4) Assume **suitable data** if **required**.

1. (a) Determine y-parameters for the network. **5**

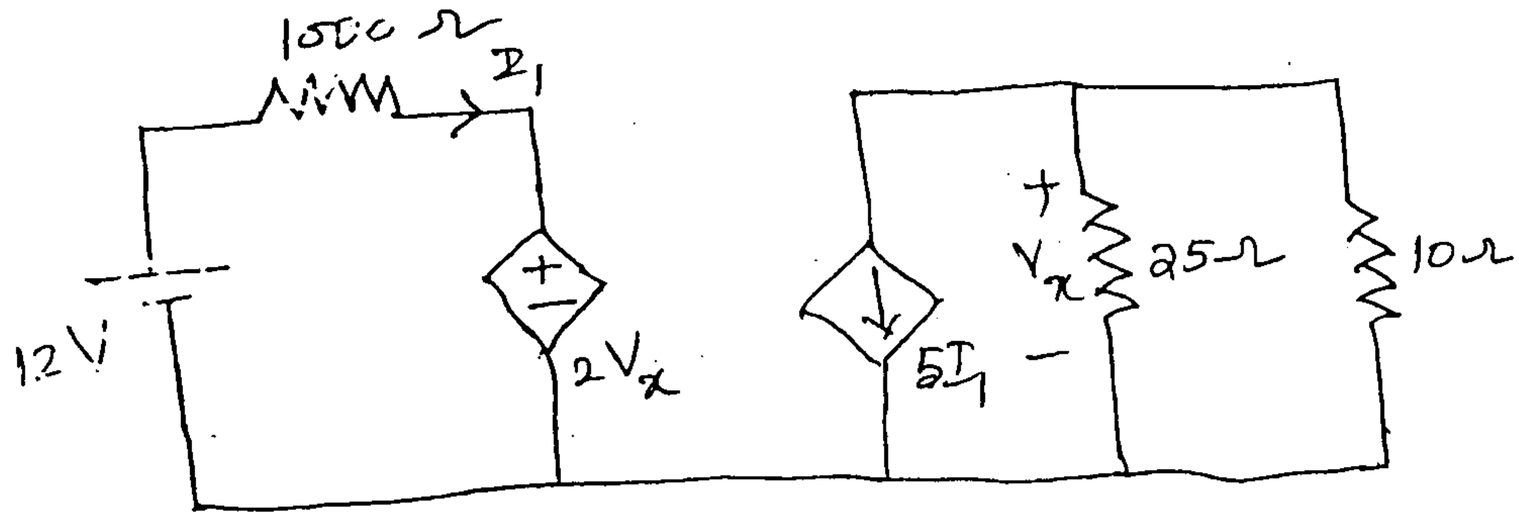


(b) The constants of a transmission line are R = 6 Ω/km, L = 2.2 mH/Km, G = 0.25×10^{-6} ℧/km, C = 0.005×10^{-6} F/km
Determine the characteristic impedeance, propagation constant and attenuation constant at 1 KHZ. **5**

(c) Test if $F(S) = 2S^6 + 4S^5 + 6S^4 + 8S^3 + 6S^2 + 4S + 2$ is a Hurwitz polynomial. **5**

(d) The current I(S) in a network is given by $I(S) = \frac{2(S)}{(S+1)(S+2)}$. Plot the pole-zero pattern in the S-plane and hence obtain i(t). **5**

2. (a) Find the current through 10Ω resistor using Norton's theorem. **10**



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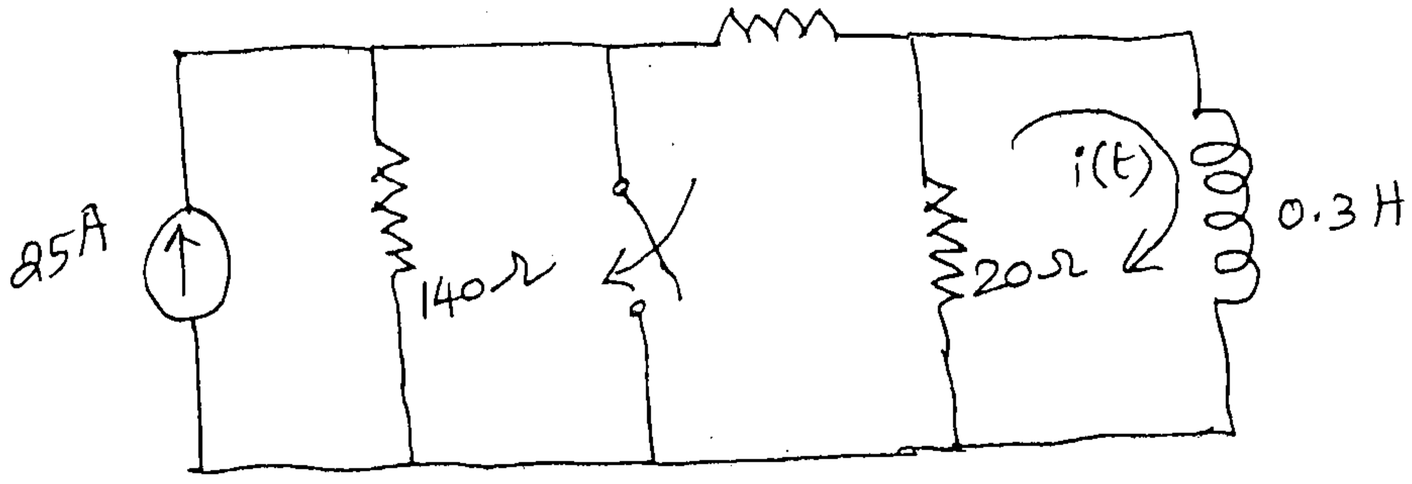
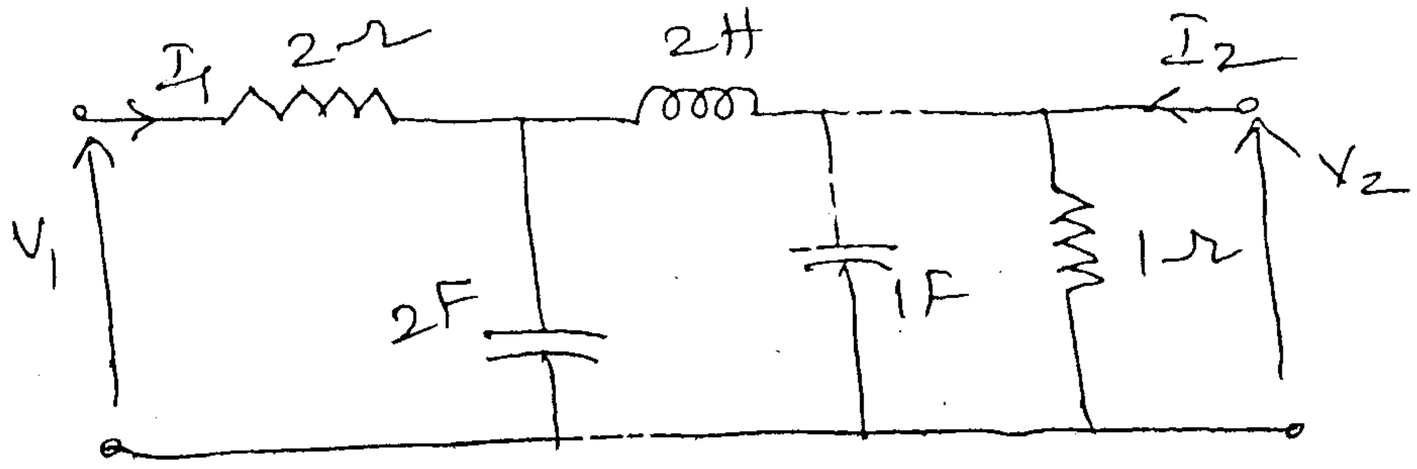
(b) Find the current i(t) for t > 0. 10



3. (a) Find Foster I and Foster II forms of the driving point function :- 10

$$F(S) = \frac{S^3 + 9S^2 + 23S + 15}{S(S^3 + 12S^2 + 44S + 48)}$$

(b) Determine ABCD parameters of the network shown :- 10



4. (a) A transmission line has a characteristic impedance of 50 Ω and terminated in a load $Z_L = 75 - j100\Omega$. Using switch chart, find 10

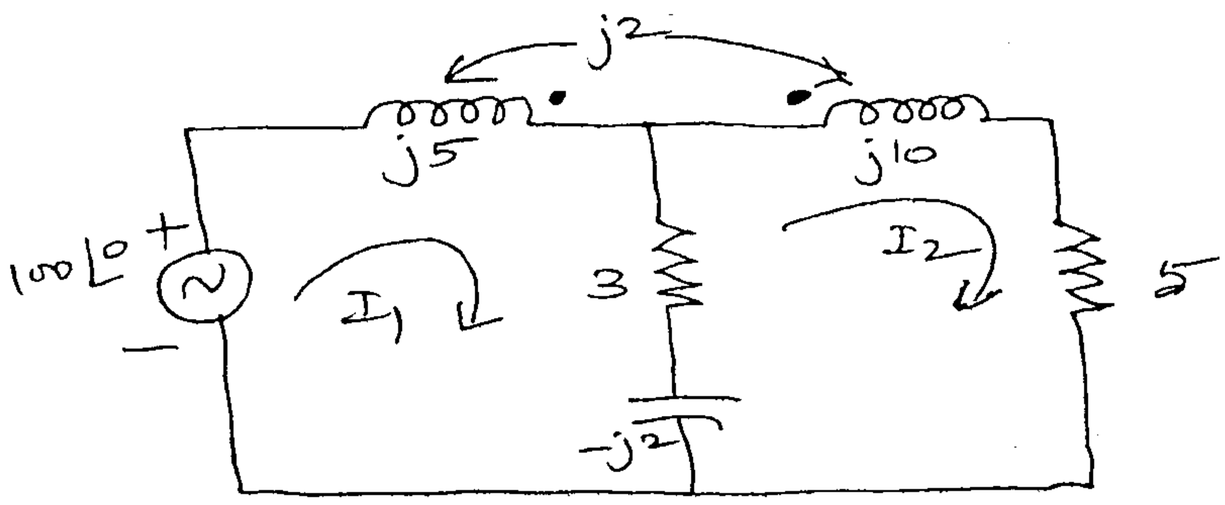
(i) VSWR

(ii) Reflection coefficient

(iii) input impedance at a distance 0.1λ from the load

(iv) location of first voltage maximum and first voltage minimum from the load.

(b) Find I_2 using mesh analysis. 10



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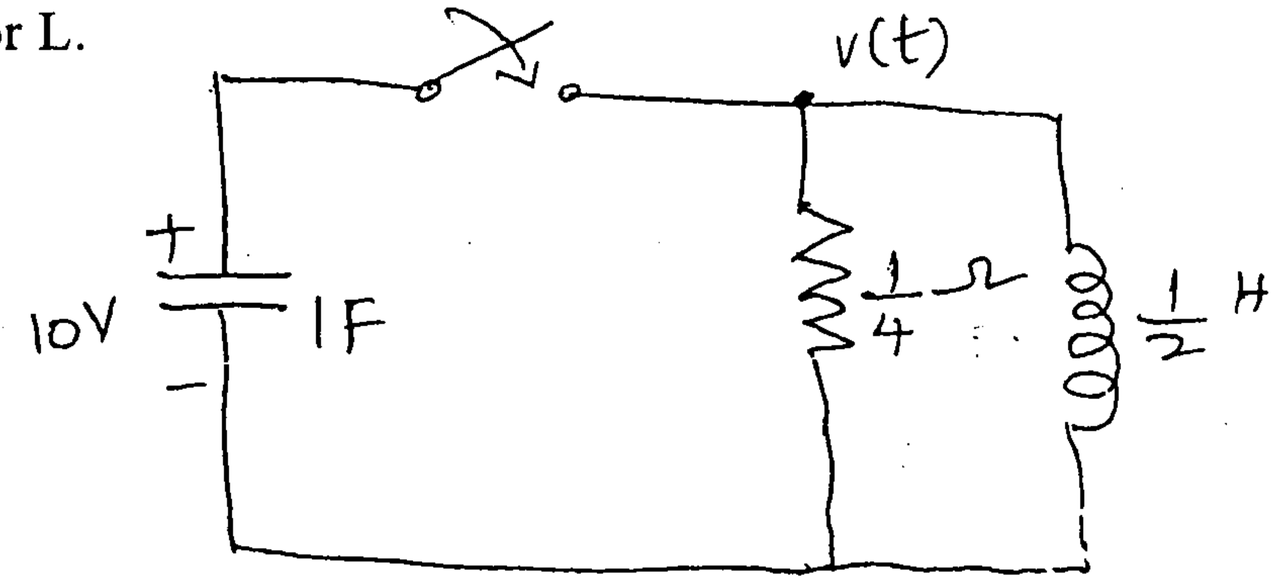
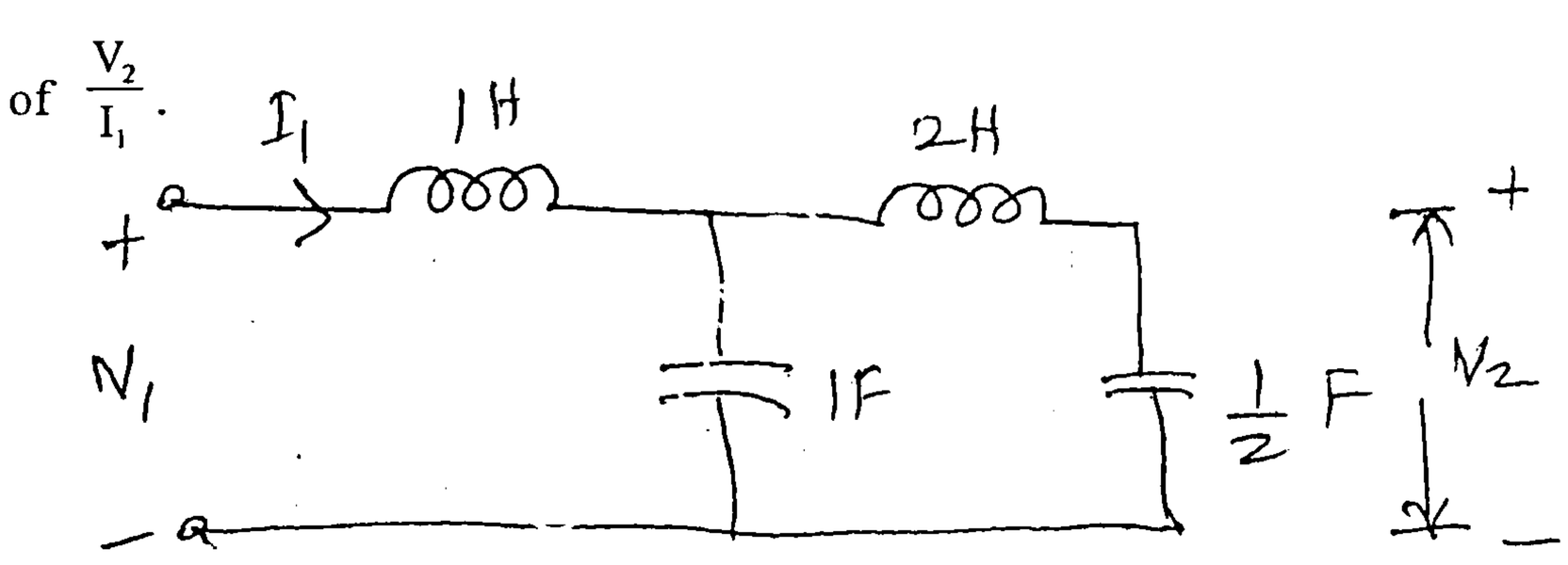
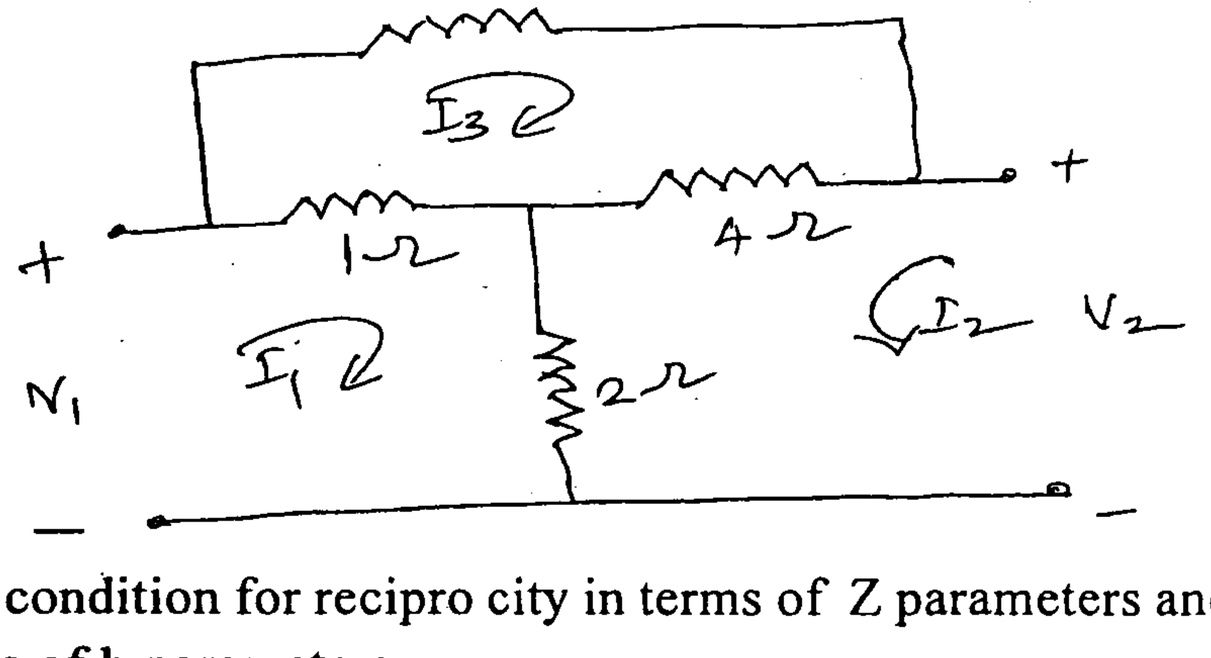
5. (a) For the network shown, capacitor C has an initial voltage $V_C(-0)$ of 10V and at the same instant, current in the inductor L is zero. The switch is closed at time t = 0. Obtain the expression for voltage V(t) across the inductor L. **10**



(b) For the network shown, determine $\frac{V_1}{I_1}$ *and* $\frac{V_2}{I_1}$. Plot the poles and zeros of $\frac{V_2}{I_1}$. **10**



6. (a) For the network shown, find the equivalent T - network. **10**



(b) Derive condition for recipro city in terms of Z parameters and symmetry in terms of h parameters. **10**
