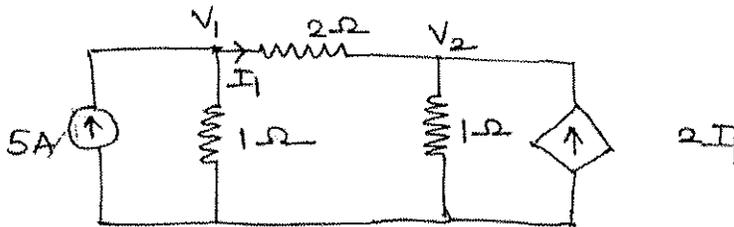
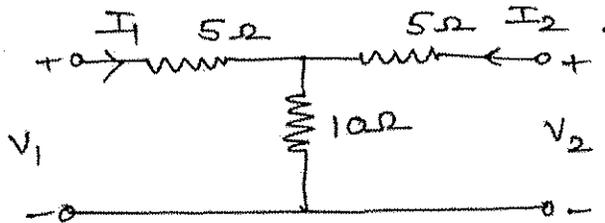


- N.B: 1. Question No. 1 is compulsory.  
2. Attempt any three from remaining questions.

1. a) Find voltages  $V_1$  and  $V_2$  by nodal Analysis for the circuit given below. 5



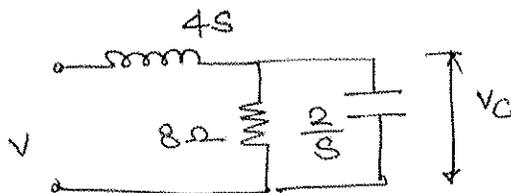
- b) Find Z parameter of the following two port network. 5



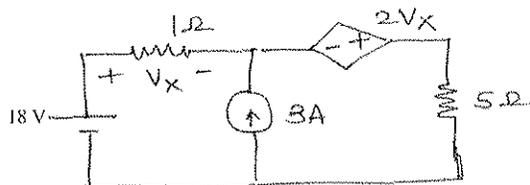
- c) Synthesize in cauer I, cauer II, Foster I and Foster II forms. 5

$$Z(s) = \frac{s}{(s+2)}$$

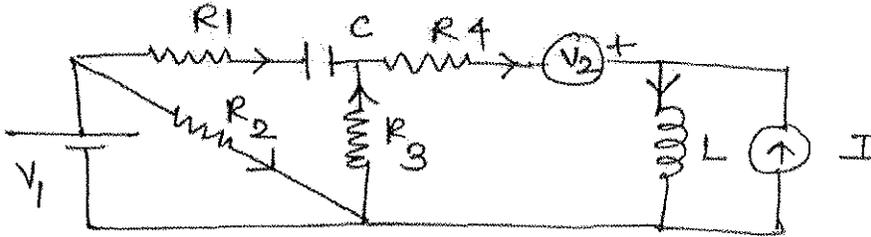
- d) For the Network shown find  $v_c/v$ . Also draw pole-zero plot. 5



2. a) Find the current through  $5\Omega$  Resistor using superposition theorem. 10



- b) Draw the oriented graph for the following circuit and obtain its incidence matrix. 5

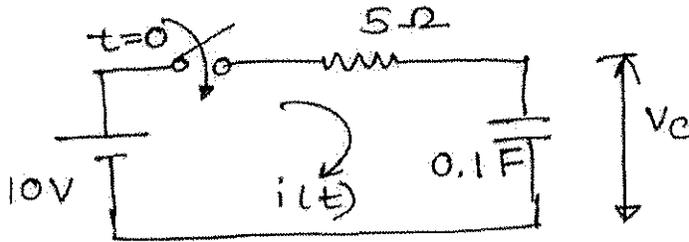


- c) Find the condition for symmetry and Reciprocity in terms of Z parameter. 5

3. a) Realise  $Z(s)$  in foster I and foster II form. 10

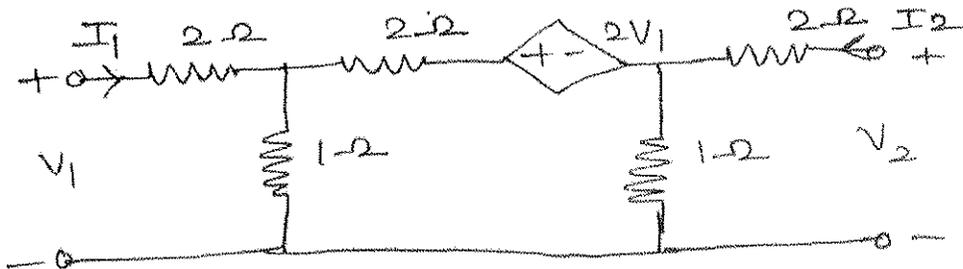
$$Z(s) = \frac{S(S^2 + 4)}{(S^2 + 1)(S^2 + 9)}$$

- b) In the following series RC circuit switch is closed at  $t = 0$ . Find  $i(t)$  and  $v_c(t)$  for  $t > 0$ . 5



- c) Test whether the given polynomial is Hurwitz 5
- i)  $S^4 + 7S^3 + 6S^2 + 21S + 8$
  - ii)  $S^5 + S^3 + S$

4. a) Find ABCD parameters of the following Network. 10



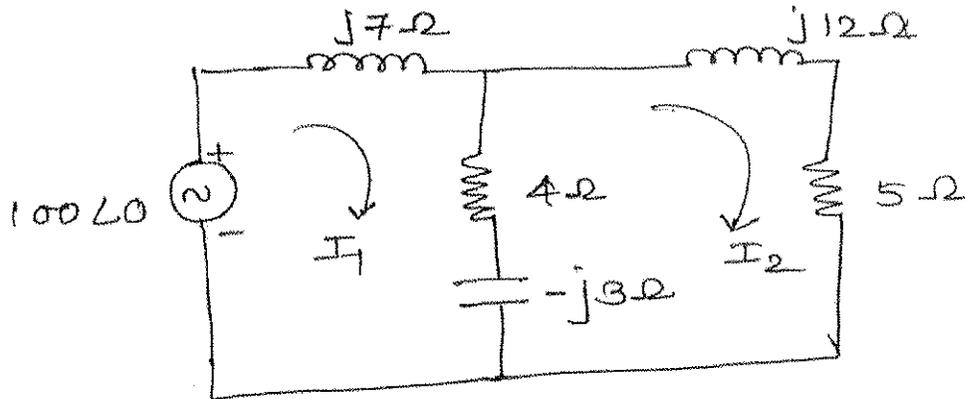
b) Test for positive Real function

5

$$F(S) = \frac{S^2 + 4}{(S^3 + 3S^2 + 3S + 1)}$$

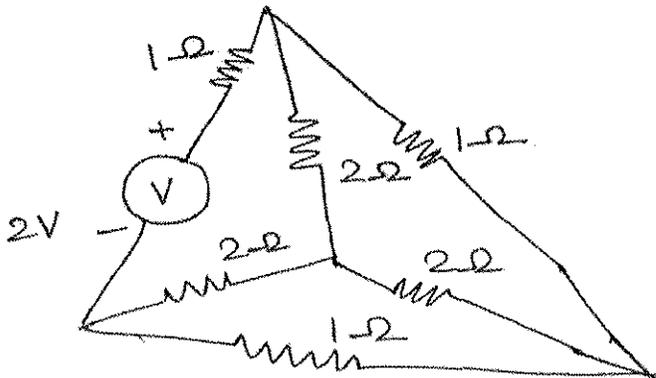
c) Find  $I_2$  using Mesh Analysis

5



5. a) Obtain equilibrium equation using KVL in matrix form. Hence find link currents.

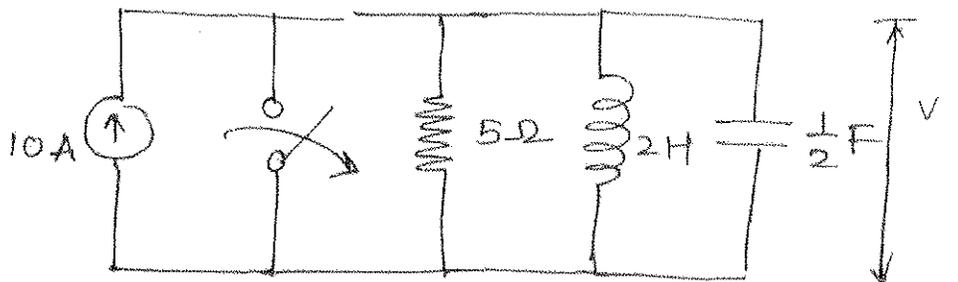
10



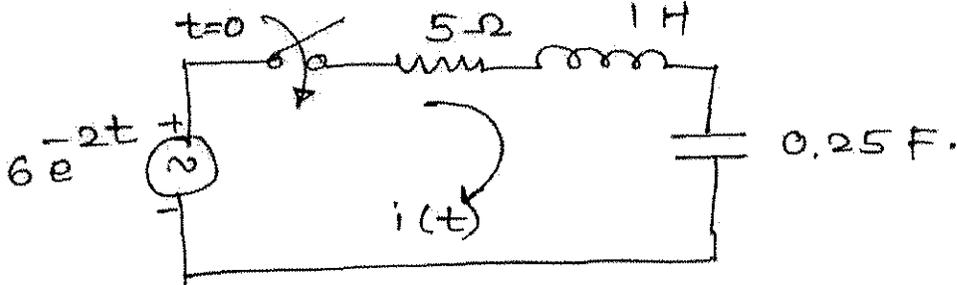
b) In the network given below the switch is closed for a long time and opened at  $t = 0$

5

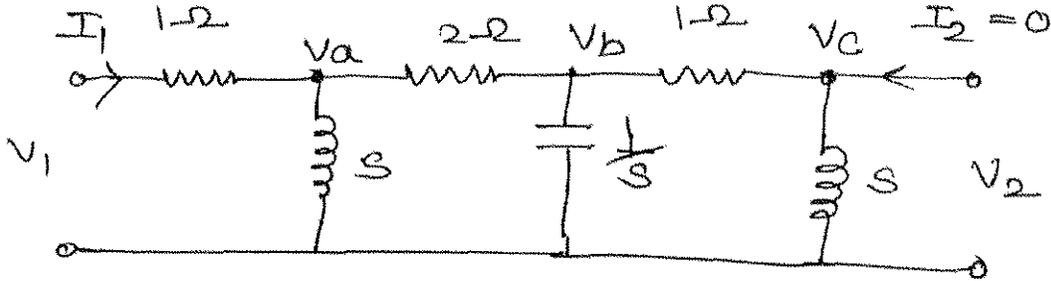
Find  $v(0^+)$ ,  $\frac{dv}{dt}(0^+)$  and  $\frac{dv^2}{dt^2}(0^+)$



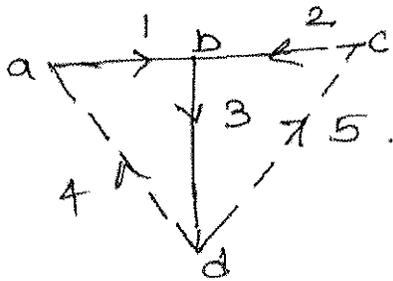
- c) The switch is closed at  $t = 0$ . Determine current  $i(t)$ , assuming zero initial condition, using Laplace transform. 5



6. a) For the ladder Network shown below obtain  $V_1/V_2, V_2/I_1$ . 10



- b) Find Z parameters in terms of Y parameters. 5  
 c) Obtain Tieset and f-cutset matrix for the following graph. 5



--- Links  
 — Twigs.

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