

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

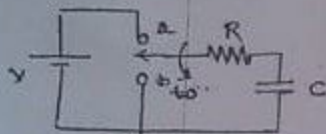
- N.B:
1. Questions No 1 is compulsory.
 2. Attempt any three questions out of remaining five.
 3. Assume suitable data is required.
 4. Figures to right indicate full marks.



Q.1 a) Test whether the following polynomials is Hurwitz.
 $f(s) = s^3 + 4s^2 + 12s + 18$

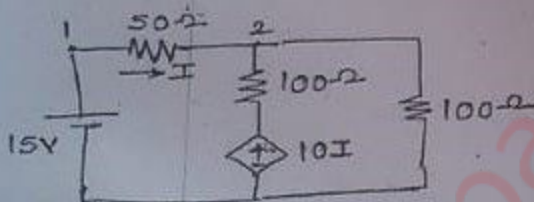
(05)

b) Find the expression for voltage across the capacitor, if switch changes the position from a to b at $t = 0$



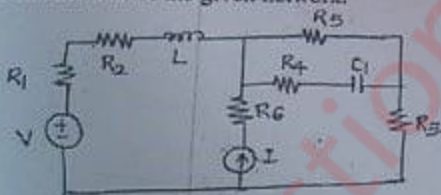
c) Find the voltage at node 2

(05)



d) Find the dual of the given network.

(05)

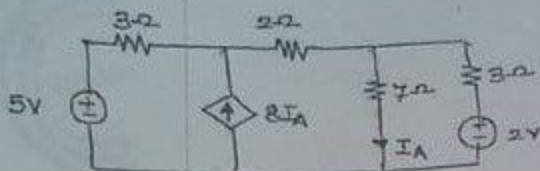


Q.2 a) Determine the value of ' R_L ' so as to have maximum power transfer to ' R_L ' in the circuit shown. (10)



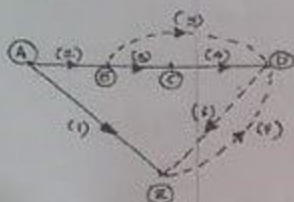
b) Using KCL find I_A

(10)



Q.3 a) Linear graph of a network is as shown. For the given tree obtain:
 i) incidence matrix
 ii) F-cutset matrix
 iii) F-tiset matrix

(10)

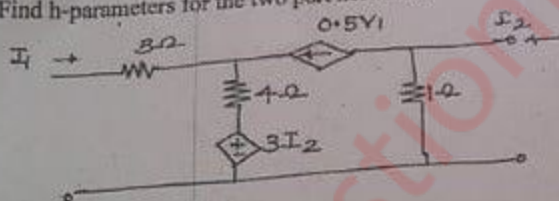


b) Find condition of symmetry & reciprocity for Y-parameters.

(10)

Q.4 a) Find h-parameters for the two port network.

(10)

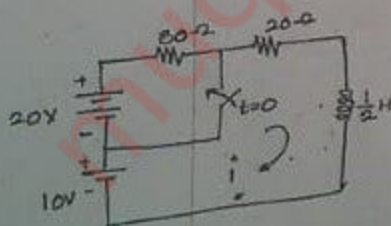


b) Show that, "The Y-parameters of the parallel connection are the sum of Y parameters of the individual networks connected in parallel".

(10)

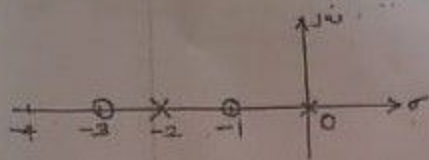
Q.5 a) The network shown reaches a steady state with switch k closed. At $t=0$, the switch is opened, find $i(t)$ for $t > 0$.

(10)



- b) With a neat diagram explain the step response of 2nd order system & define (i) Delay time ii) Rise time iii) Peak time iv) Peak overshoot iv) Settling time. (10)

- Q. 6 a) An impedance function has the pole zero plot as shown. Find the impedance function $z(s)$ if $z(-4) = \frac{3}{8}$ then realize it in the caner I form. (10)



- b) Find Foster I & Foster II form for a given function. (10)

$$\frac{(s+4)(s+3)}{(s+2)(s+6)}$$
 (10)
-