[Time: 3 Hours]   [Marks:80]
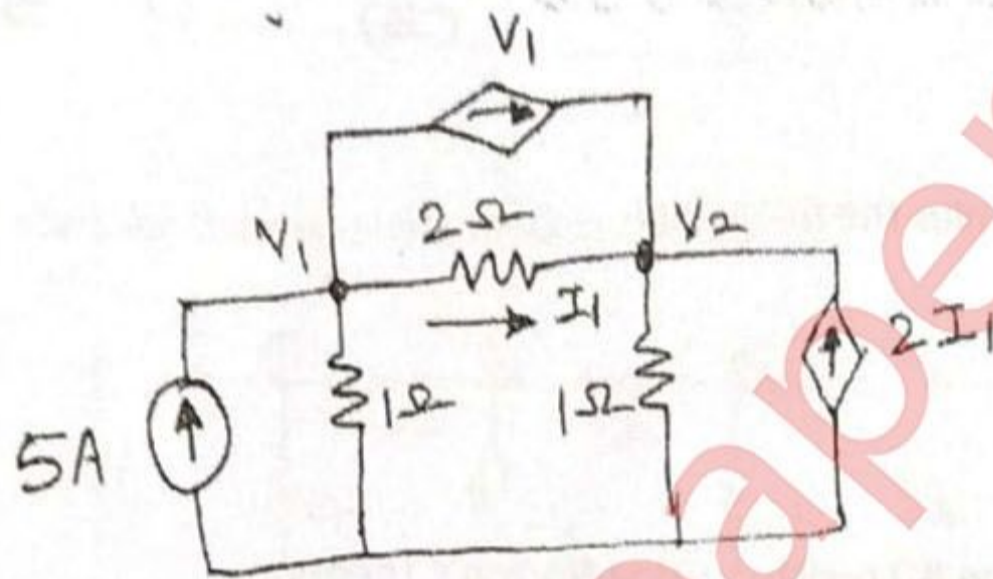
Please check whether you have got the right question paper.
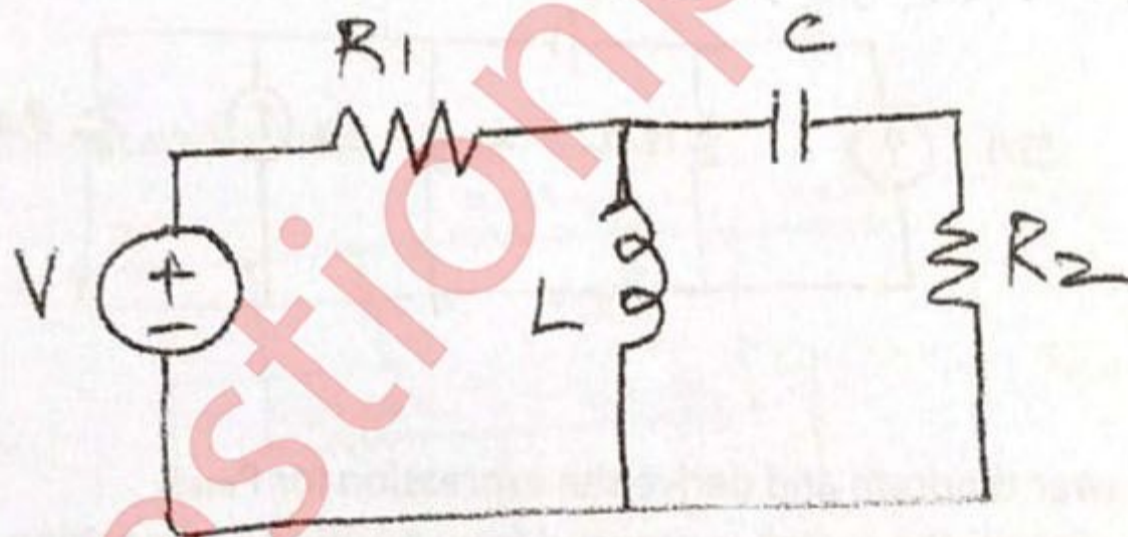
N.B: 1. Question No. 1 is compulsory.
        2. Attempt any three questions out of the remaining five.
        3. Assume suitable data if required.
        4. Figures to the right indicate full marks.

Q.1 a) Find voltages V_1 and V_2 05
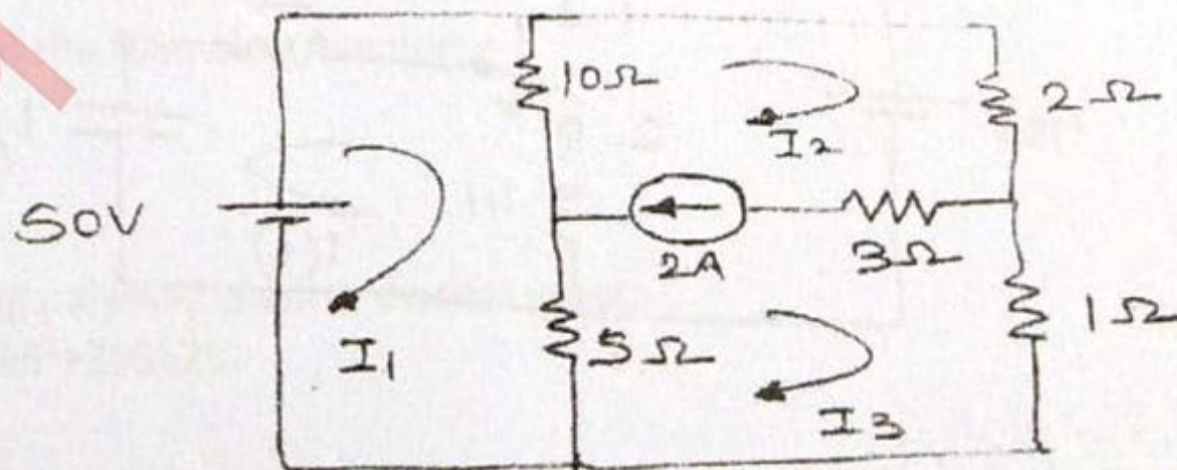

b) Draw the dual of the following network.   05

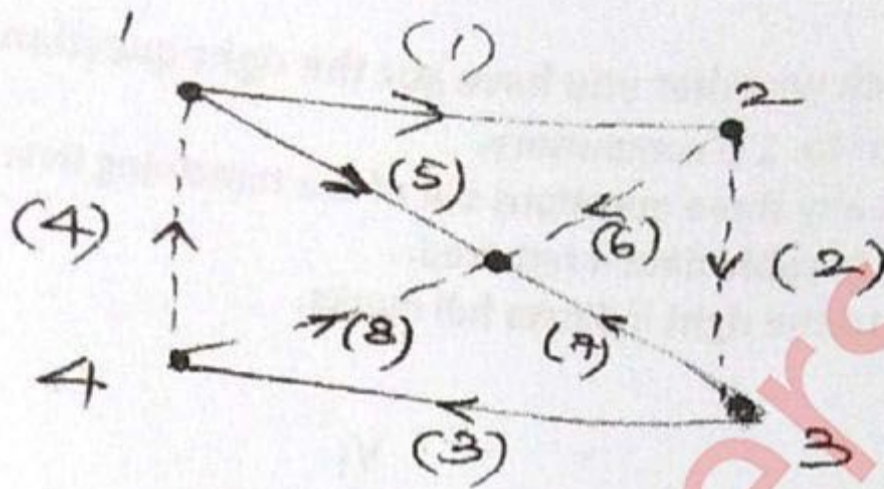C) Find the current in the 5 Ω resistor.   05

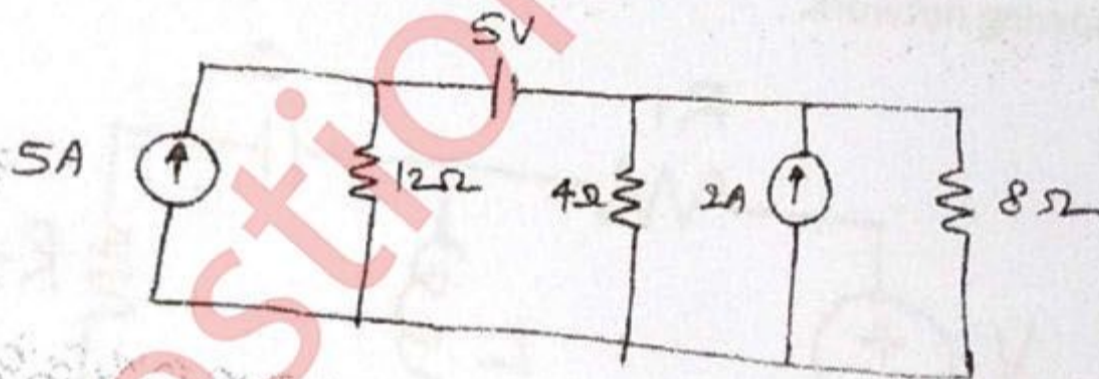d) Write a short note on initial conditions and its significance   05

Q.2 a) For the graph shown, write the incidence matrix, tieset matrix and f-cutest matrix.   12

b) Define with suitable examples the following:-   08
   i) Planar graph.
   ii) Non-planar graph.
   iii) Tree
   iv) Co-tree.

Q.3 a) Find the current through the 8Ω resistor, using Norton's Theorem.   10

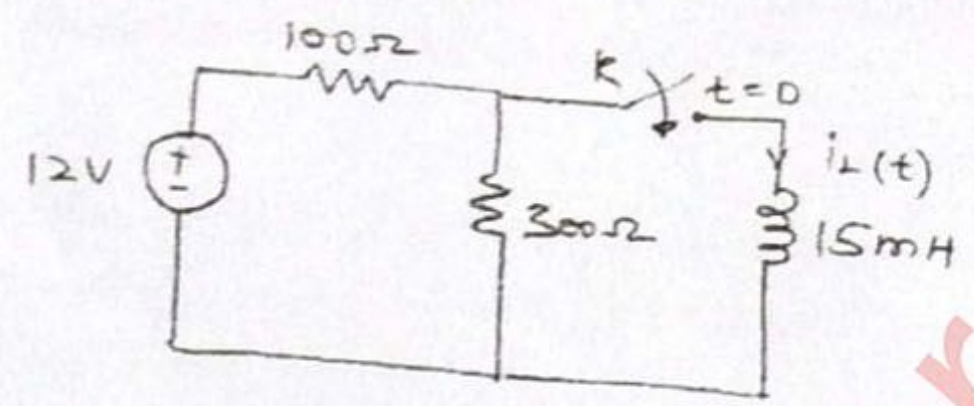b) Derive the maximum power theorem and derive the expression for P_{max}.   05
c) In the network shown in figure, the switch is changed from position 1 to position 2 at t=0, steady condition   05
   having reached before switching. Find the values of i, $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ at t=0+
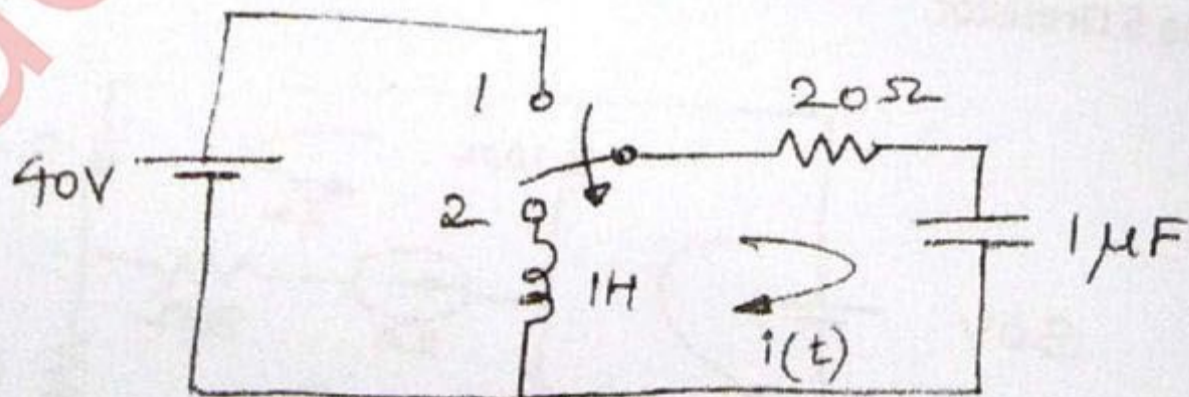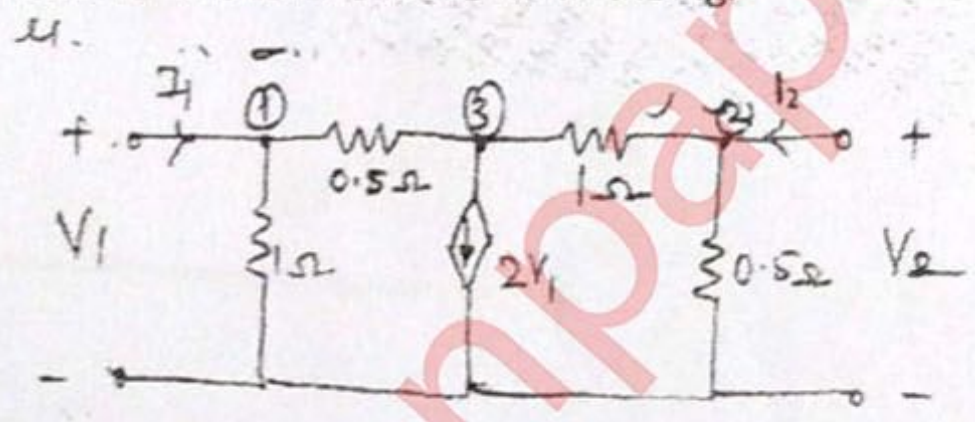
a) In a network shown the switch is closed at t=0. Determine i_2 (t)   10
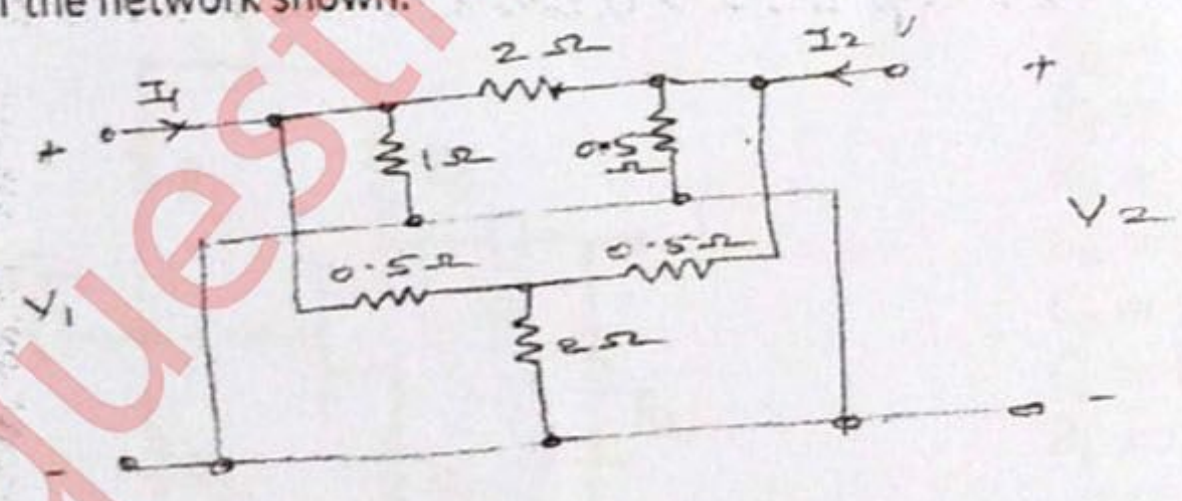

Q.4 b) Determine the Y and Z parameters for the network shown in the fig.   10

Q.5 a) Find the Y parameters of the network shown.   10

b) Define transmission parameters and find their condition of reciprocity and symmetry.   10

Q.6 a) Realize the foster forms of the following function:-   10

$$z(s) = \frac{2(s+2)(s+4)}{(s+1)(s+3)}$$

b) Check wheather following polynomials are rewrite or not:-   10

i) $P(s) = 2S^6 + S^5 + 13S^4 + 6S^3 + 56S^2 + 25S + 25$

ii) $P(s) = S^8 + 5S^6 + 2S^4 + 3S^2 + 1$

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