Q. P. Code: 24370

(3 Hours)

[Total marks: 80]

N.B:- (1) **Question 1 is compulsory**
    (2) Solve any **three** questions from remaining **five** questions.
    (3) Figures to the right indicate **full** marks.
    (4) Assume suitable data if necessary.

Q1   Attempt the following   20

    a) Write short note on duality of network
    b) Find the condition of reciprocity for Z parameters.
    c) Write properties of positive real function
   d) Test whether the polynomial $s^5 + 3s^3 + 2s$ is Hurwitz.

Q2 a)   Linear graph of a network is given below. Write f-cutset, f-tieset and incidence   10
matrix.
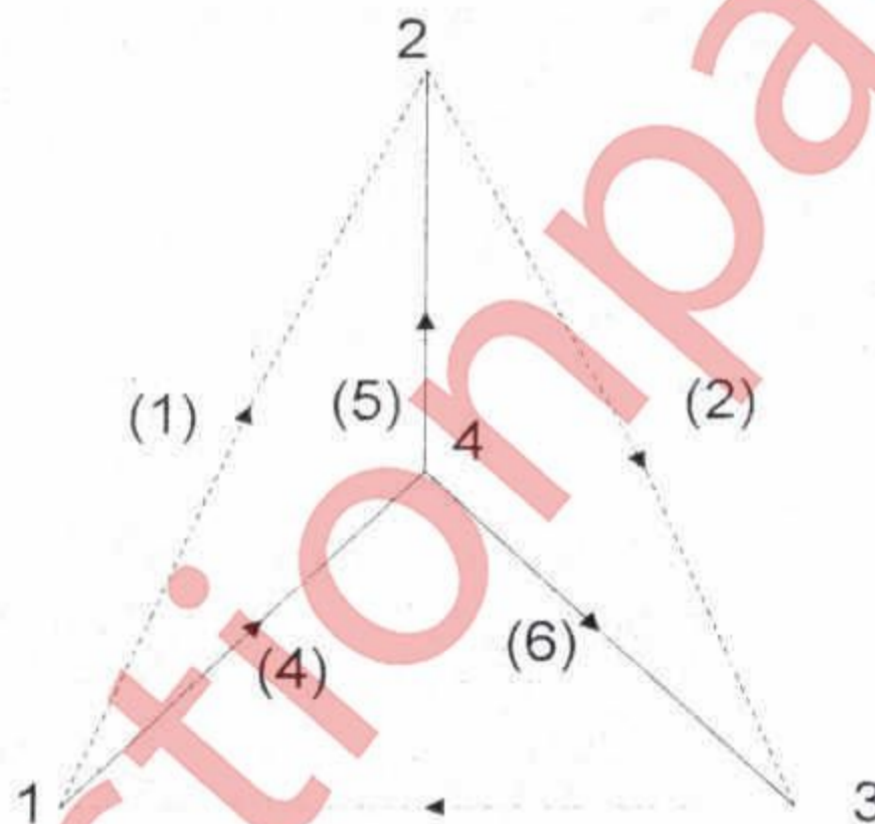
Q2 b)   The network shown has acquired steady state with the switch closed for t<0. At   10
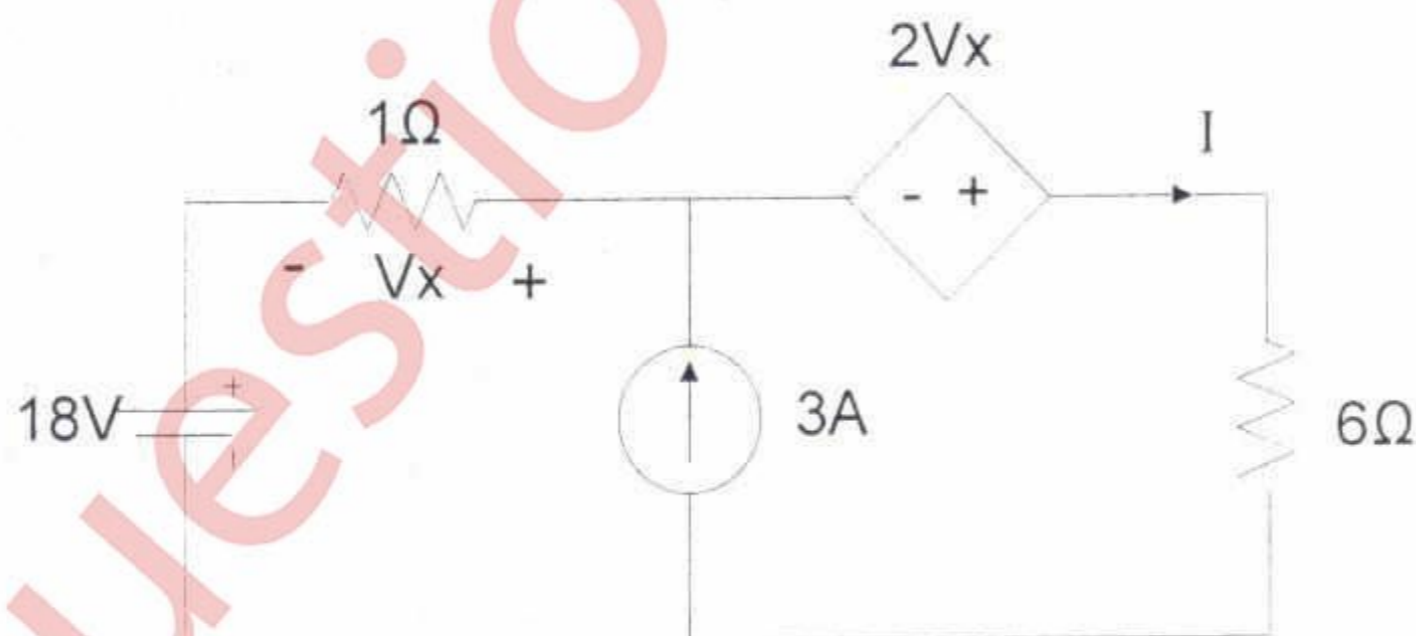t=0, the switch is opened. Obtain i(t) for t>0.

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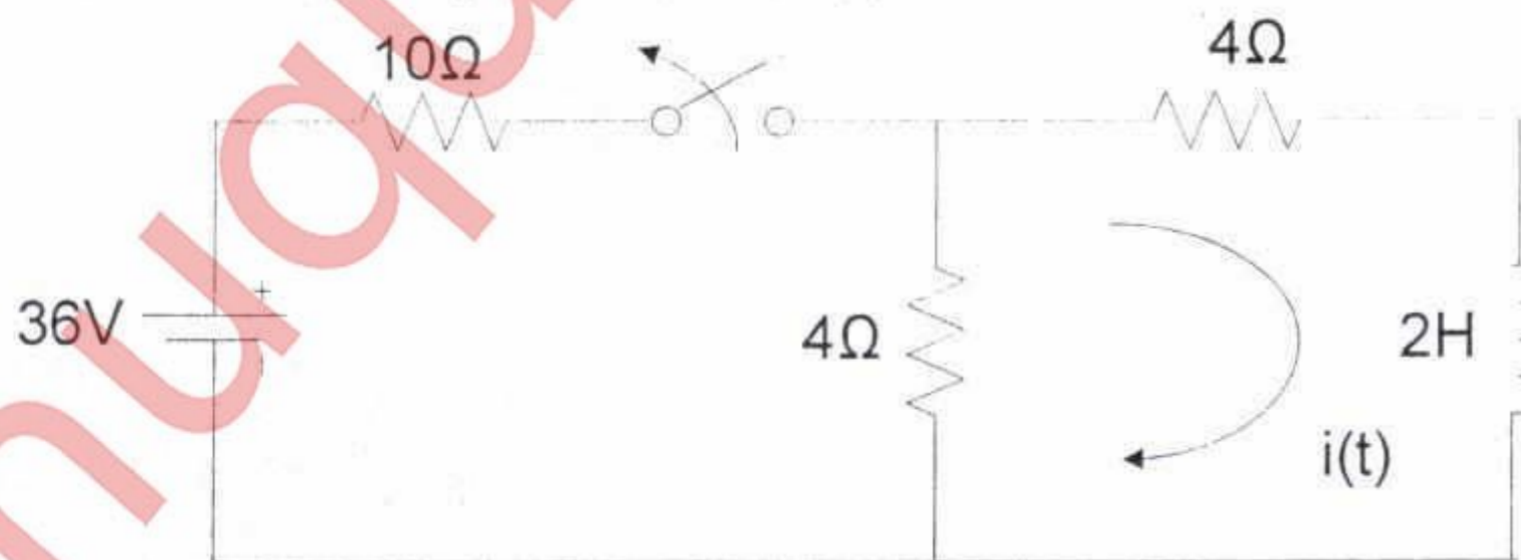
Q3 a) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, \dfrac{di}{dt}, \dfrac{d^2i}{dt^2}$ at t=0⁺.   10

10Ω 1H

10V

1µF

i(t)
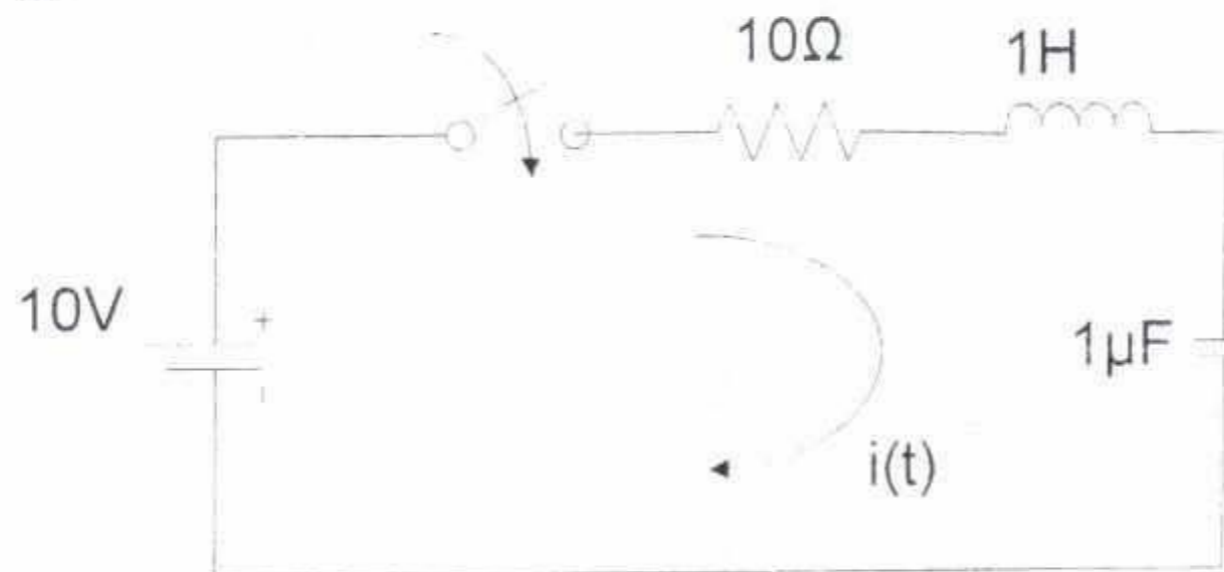
Q3 b) In the network shown, the switch is initially at position 1. On the steady state having reached, the switch is changed to the position 2. Find current i(t).   10
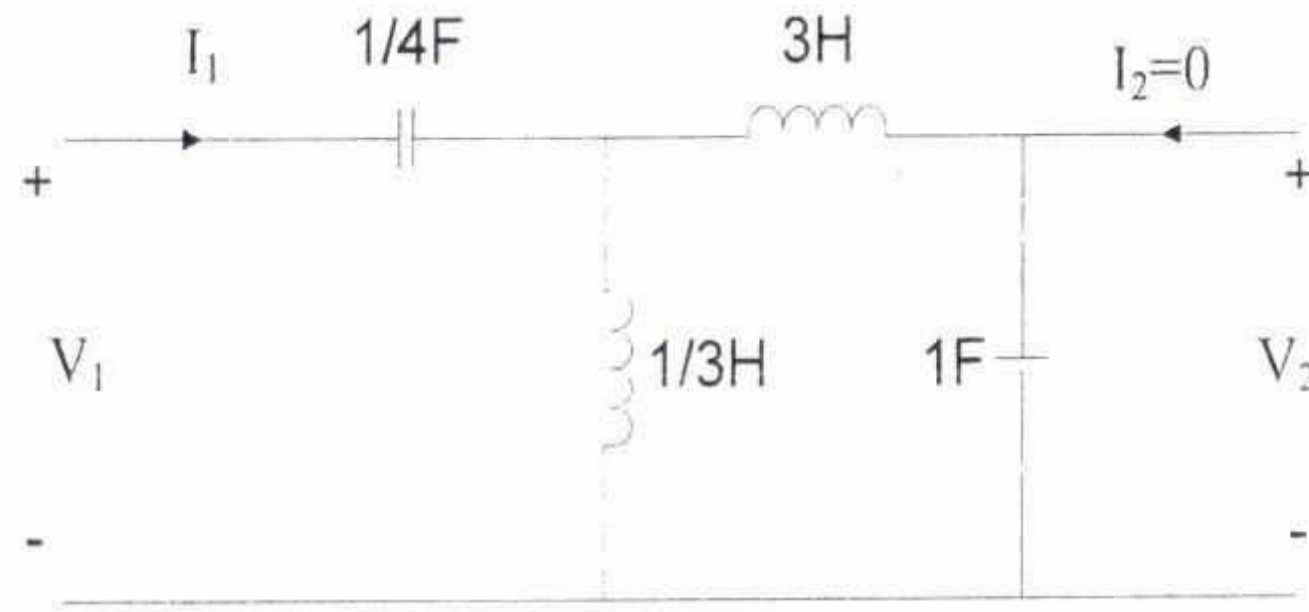
1

2

R1

V

R2

L

i(t)
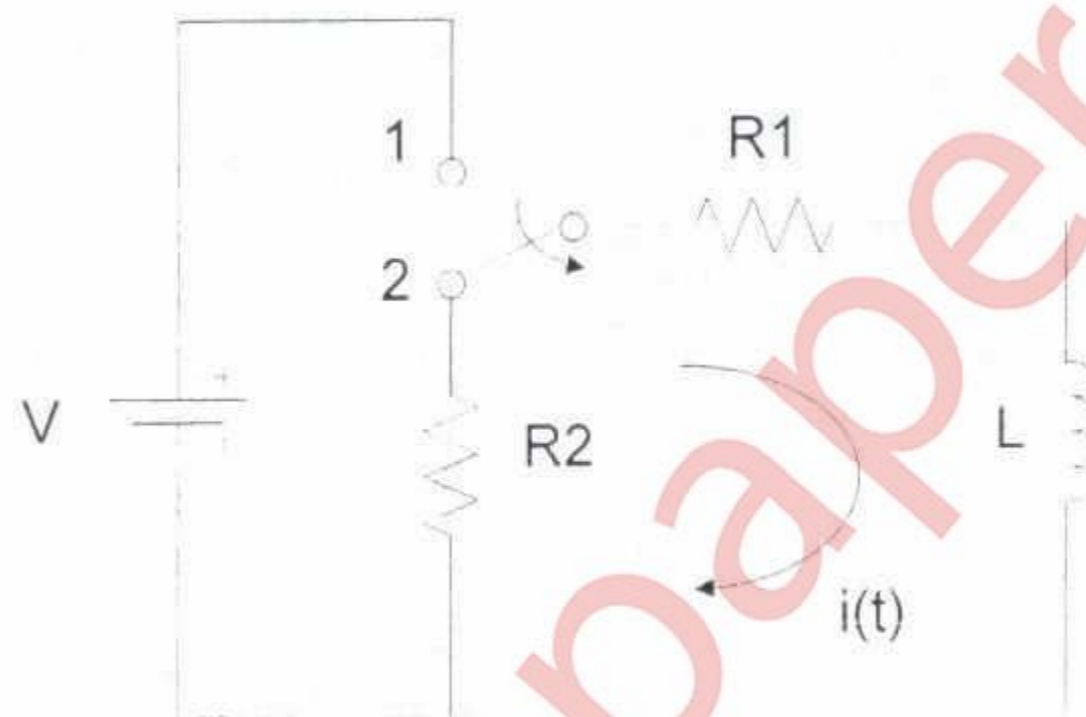
Q4 a) Find the current in the 6Ω resistor using nodal voltage   10

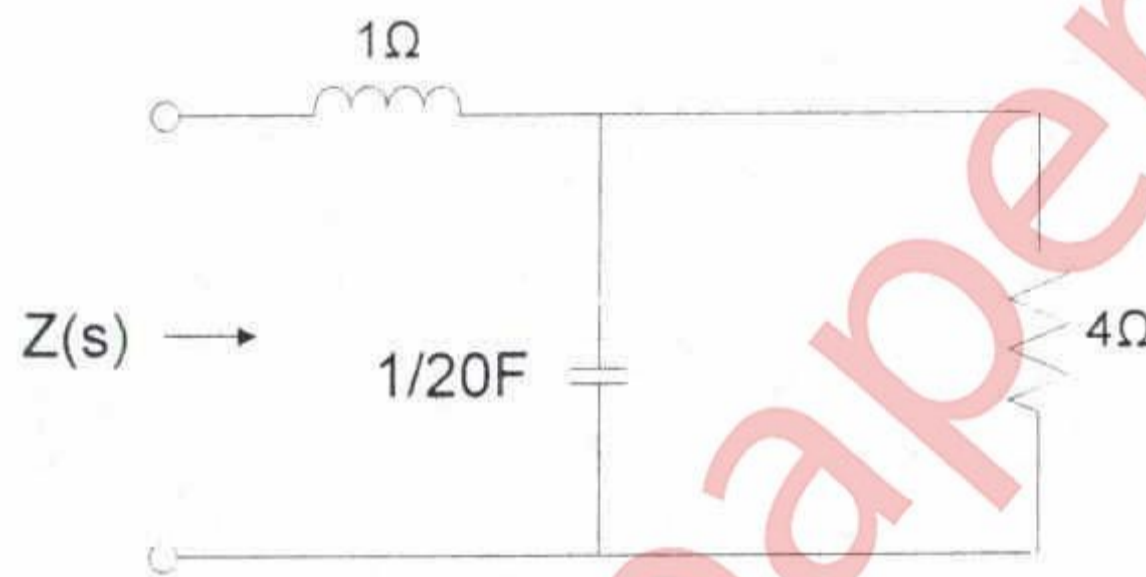2Vx

1Ω

I

- Vx +

- +

18V

3A

6Ω

C80E4FE6372EAB1099FFA19B771DB150

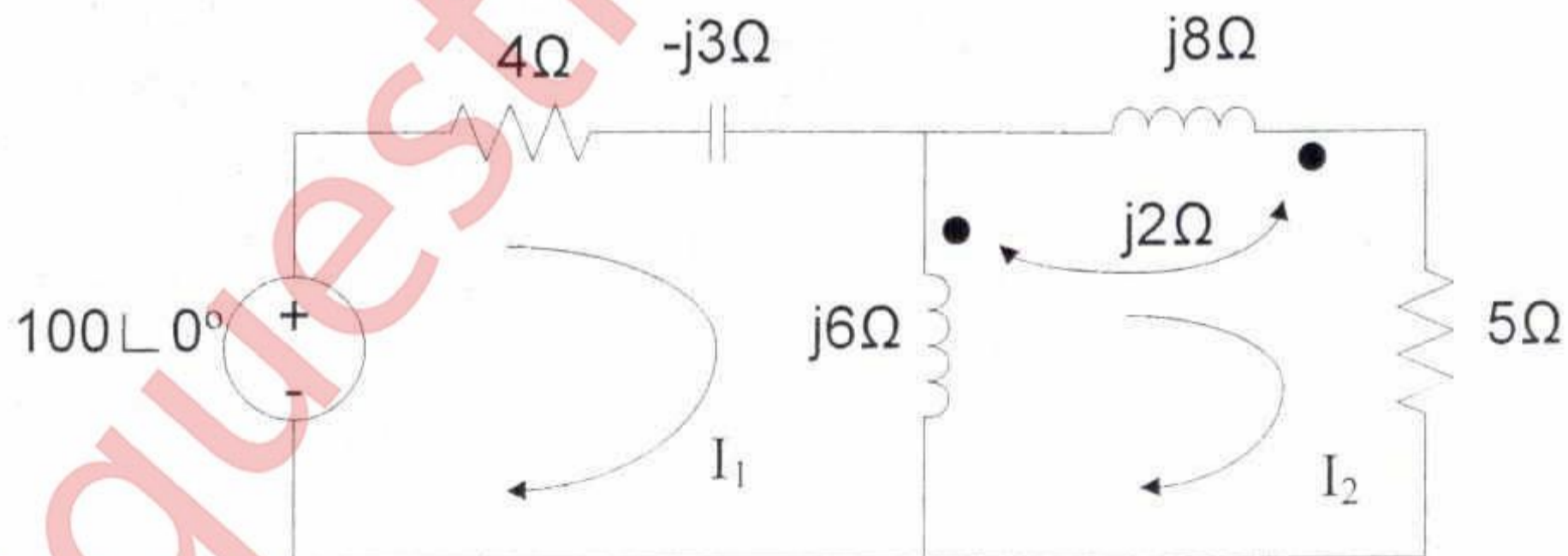Q4 b) Find Z_{11} and G_{12} for the following circuit. 10

Q5 a) Determine Z(s) in the network shown. Find out poles and zeros of Z(s) and plot 10
them on s-plane

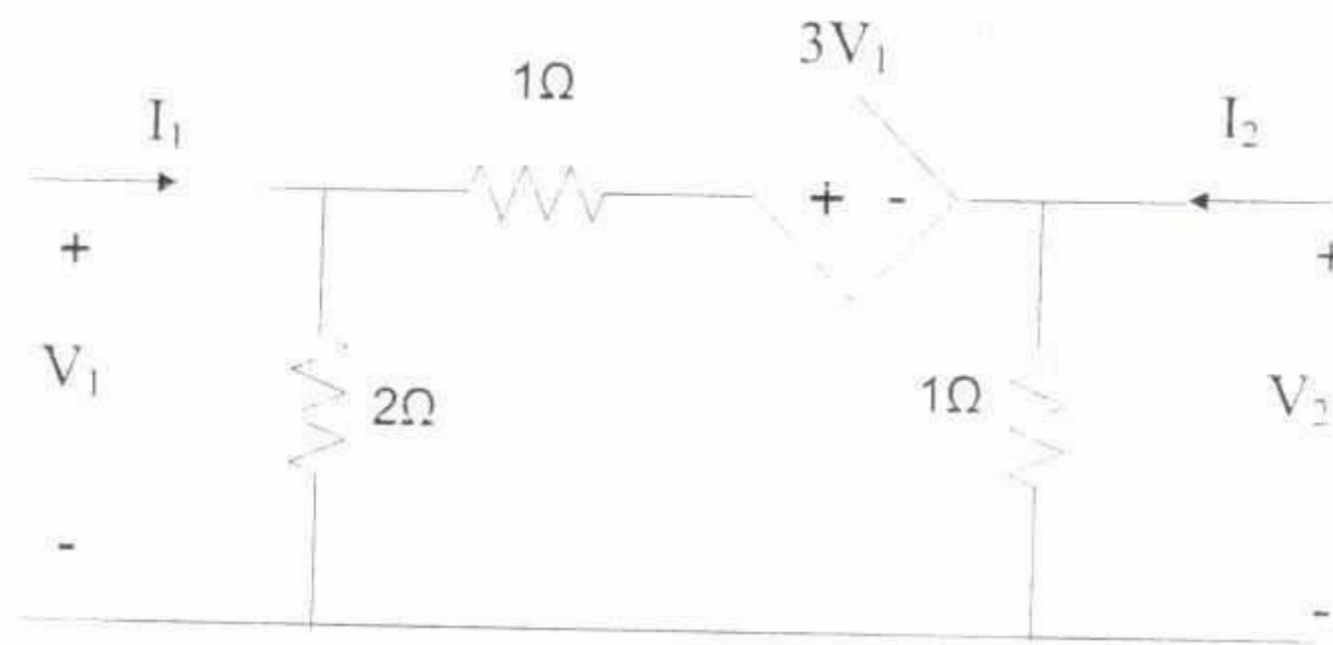Q5 b) Realize Cauer 1 and Cauer II form for following function 10

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

Q6 a) Calculate the mesh currents in the circuit shown 10

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Q6 b)   For the network shown , find Y and Z parameters   10

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Correction : T1223 / T1485 ELECTRICAL NETWORKS **QP Code : 24370**
Question No. 5 a). Inductor value is 1Henry instead of 1ohm in the circuit given

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