

4/6/13 S.E. Sem III (Reg)

CE Electronics

Electrical Network Analysis
and Synthesis

P3-upq-Feb.-13KL-309 A4 E

Con. 6623-13.

GS-6606

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any four questions out of remaining six questions.

(3) Assume suitable data wherever necessary.

(4) Figures to the right indicate full marks.

1. (a) Explain Y-parameters interms of Z-parameters. 5

(b) Draw the dual of the network shown in figure (a). 5

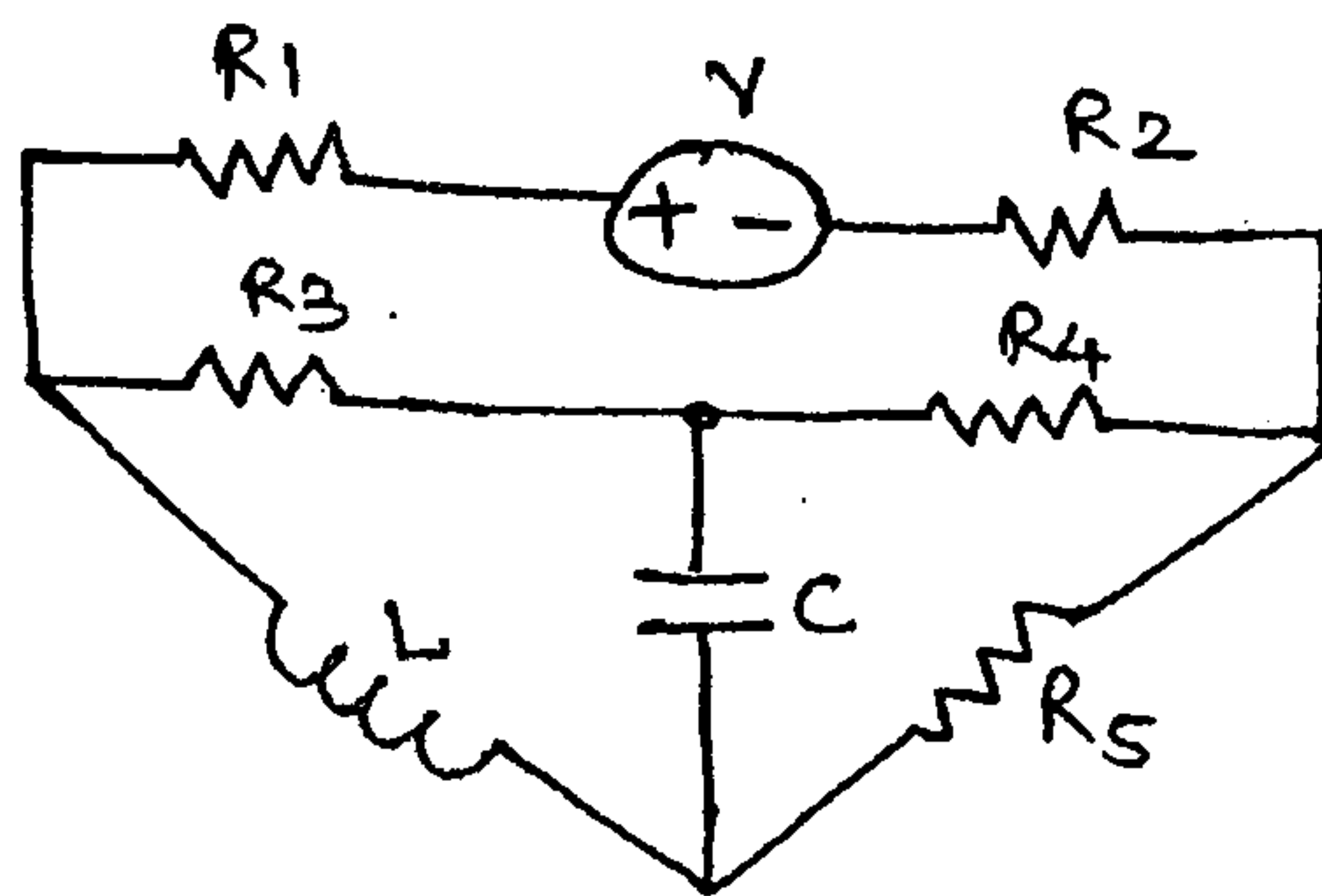


figure (a)

(c) Find the poles and zeros of impedance of the network shown in figure (b). 5

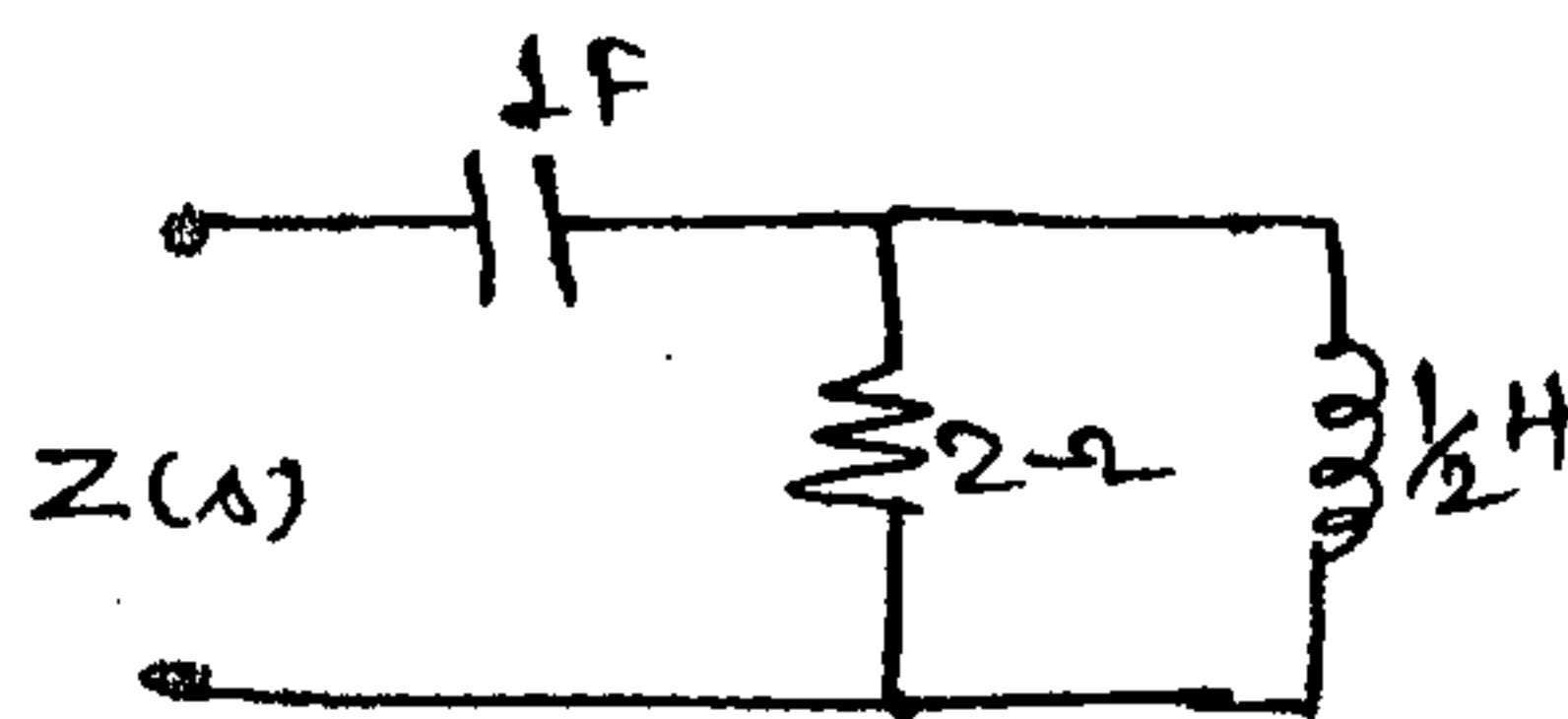


figure (b)

(d) State the properties of pzf. 5

2. (a) Find the Thevin equivalent network of figure (c). 10

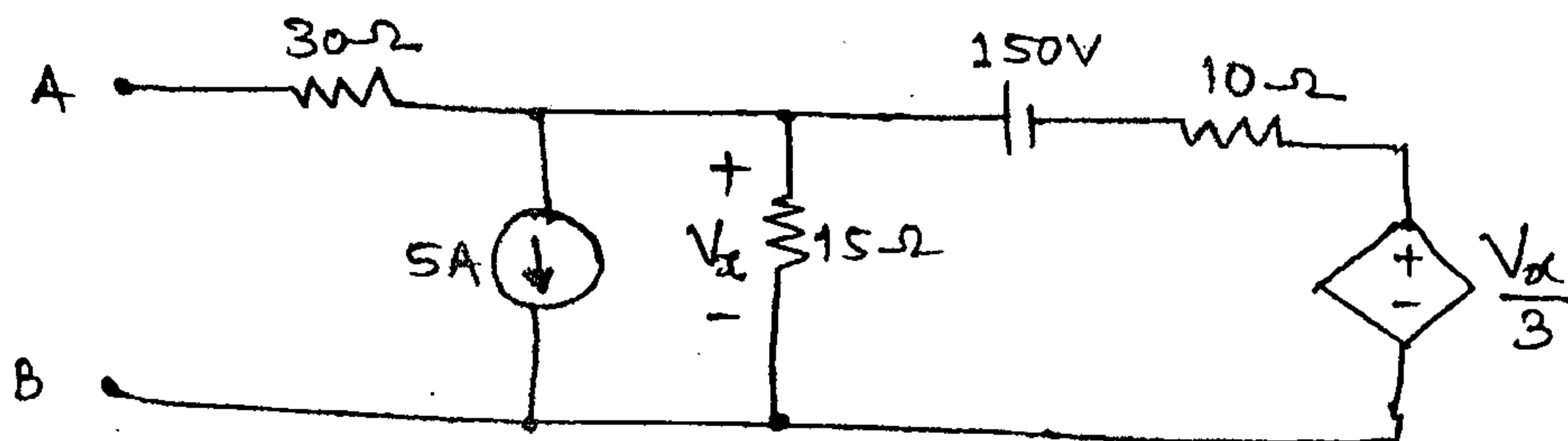


figure (c)

[TURN OVER

(b) Find the current I_2 using mesh analysis of figure (d).

10

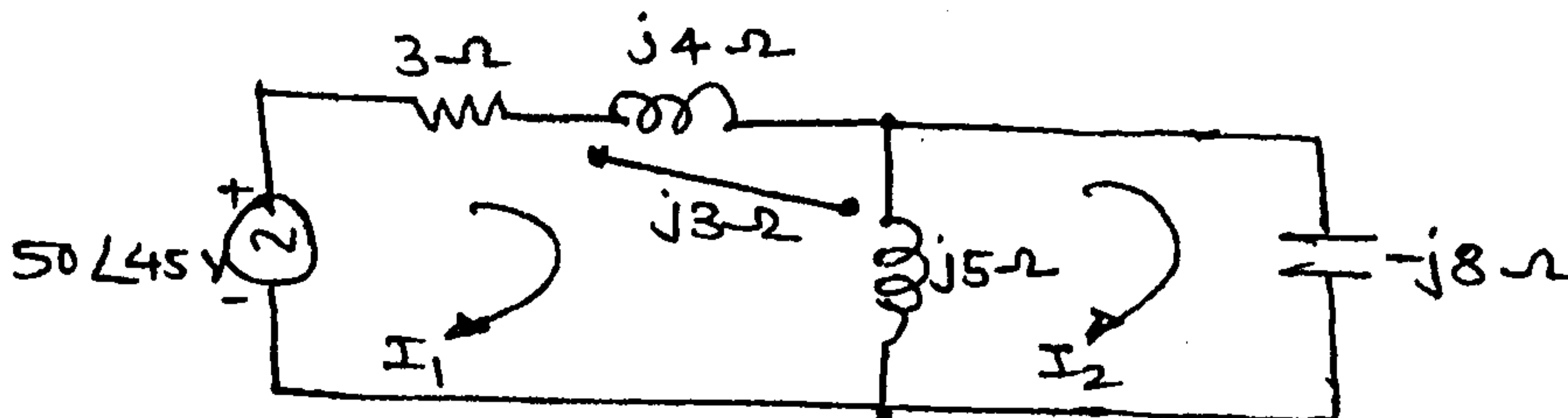


figure (d)

3. (a) The switch is closed at $t = 0$, find values of I , $\frac{dI}{dt}$, $\frac{d^2I}{dt^2}$ at $t = 0^+$. Assume all initial current of inductor to be zero for circuit (e).

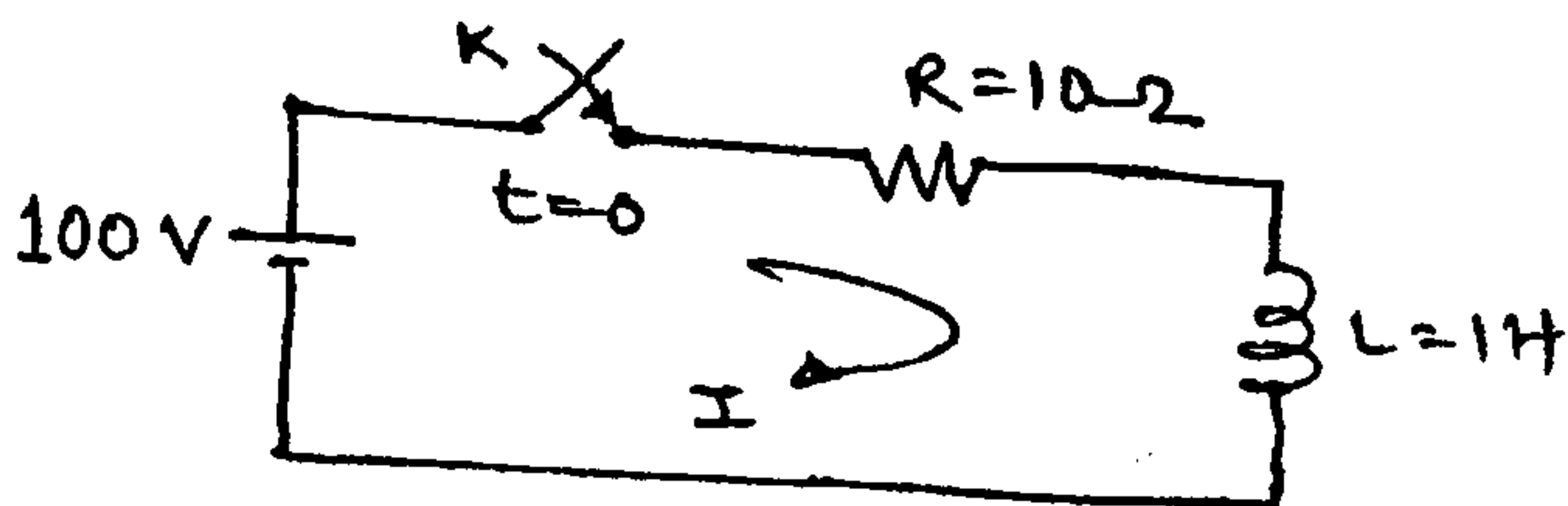


figure (e)

(b) Calculate the twig voltages using KVL equations for network shown in figure (f).

10

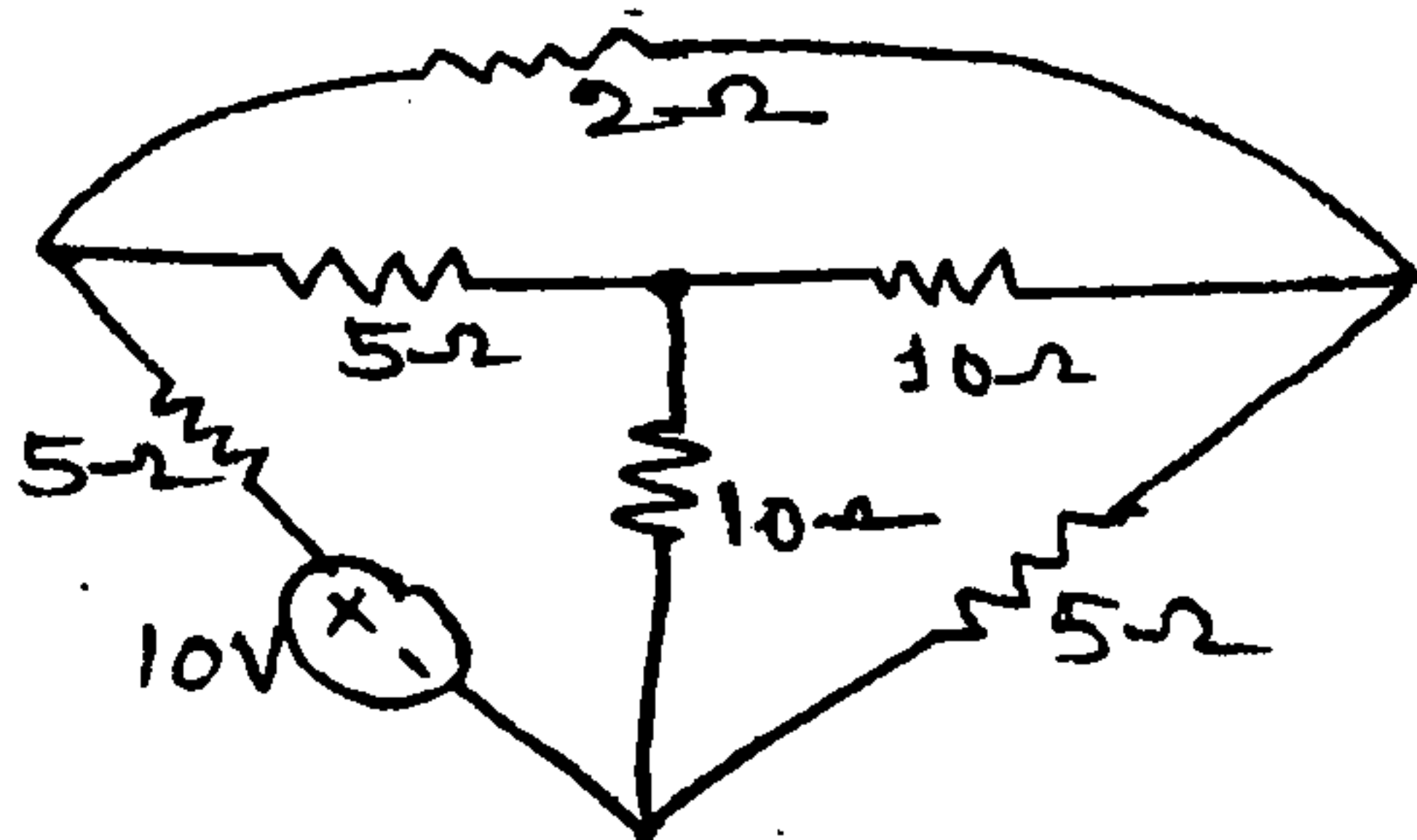


figure (f)

4. (a) Determine Y-parameters for network in figure (g).

10

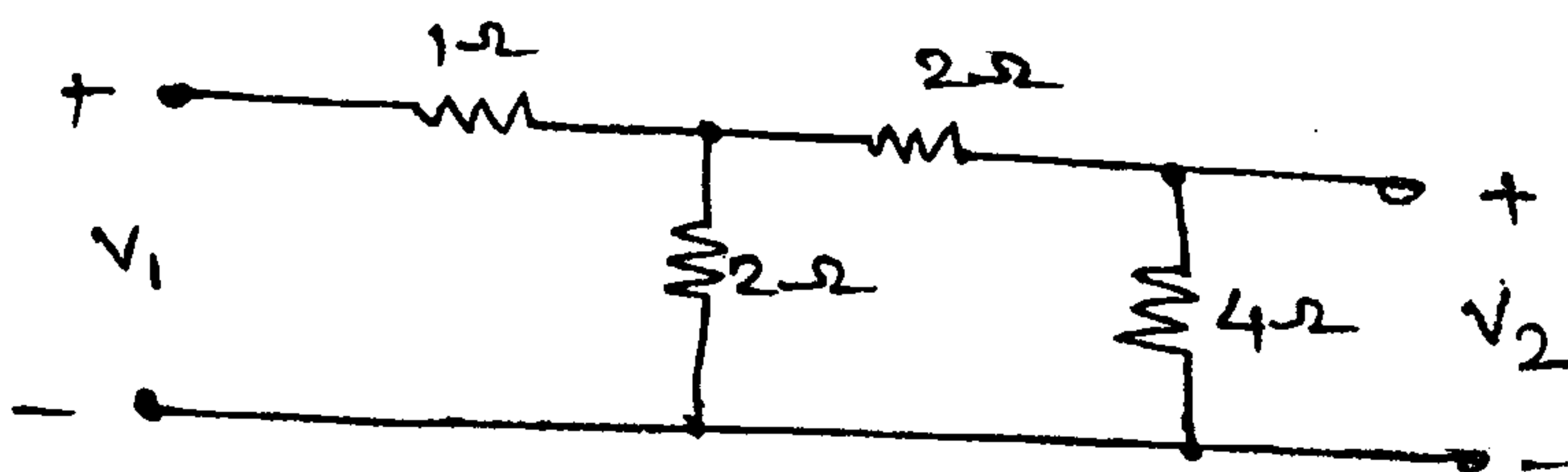


figure (g)

- (b) In the network **figure (h)**. Determine the currents $i_1(t)$ and $i_2(t)$ when the switch 'k' is closed at $t = 0$. 10

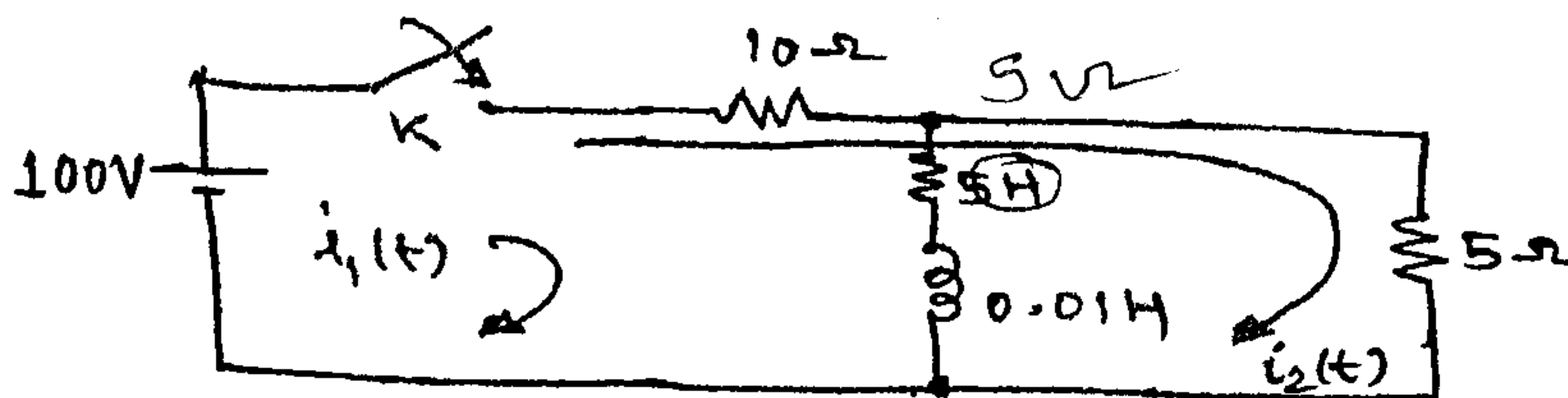


figure (h)

5. (a) The pole-zero diagram of driving point impedance function of network **figure (i)**. 10
At d.c. the input impedance is resistive and equal to 2Ω . Determine the values of R-L and C.

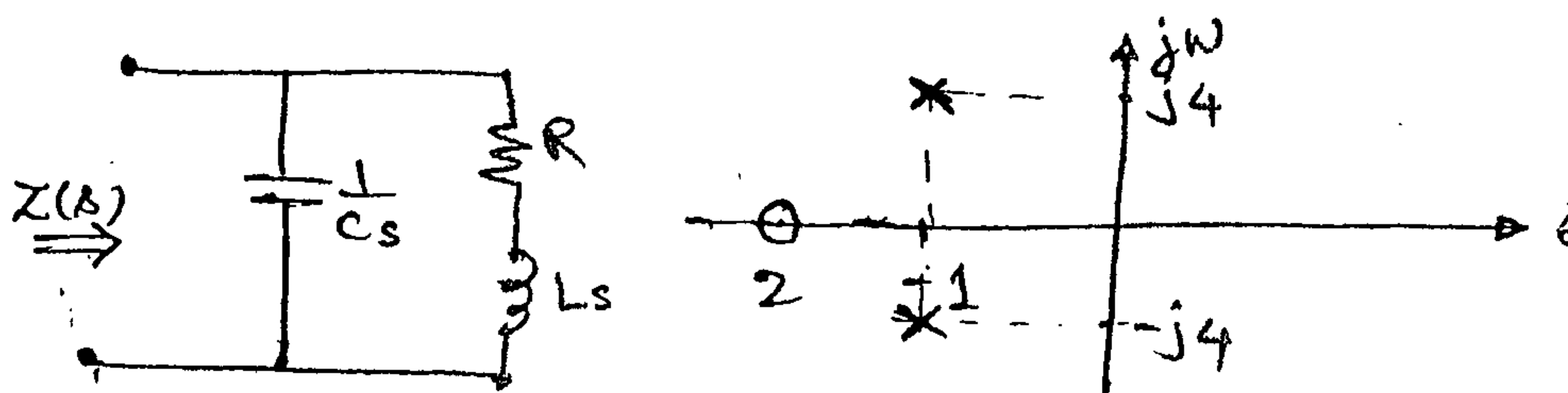


figure (i)

- (b) Test whether the following polynomials are Hurwitz. Use continuous fraction expansion method :—
 (i) $s^4 + 2s^2 + 2$
 (ii) $s^7 + 2s^6 + 2s^5 + s^4 + 4s^3 + 8s^2 + 8s + 4$
6. (a) Determine the node voltages at 1 and 2 of the network shown in **figure (f)**. Use 10 nodal analysis.

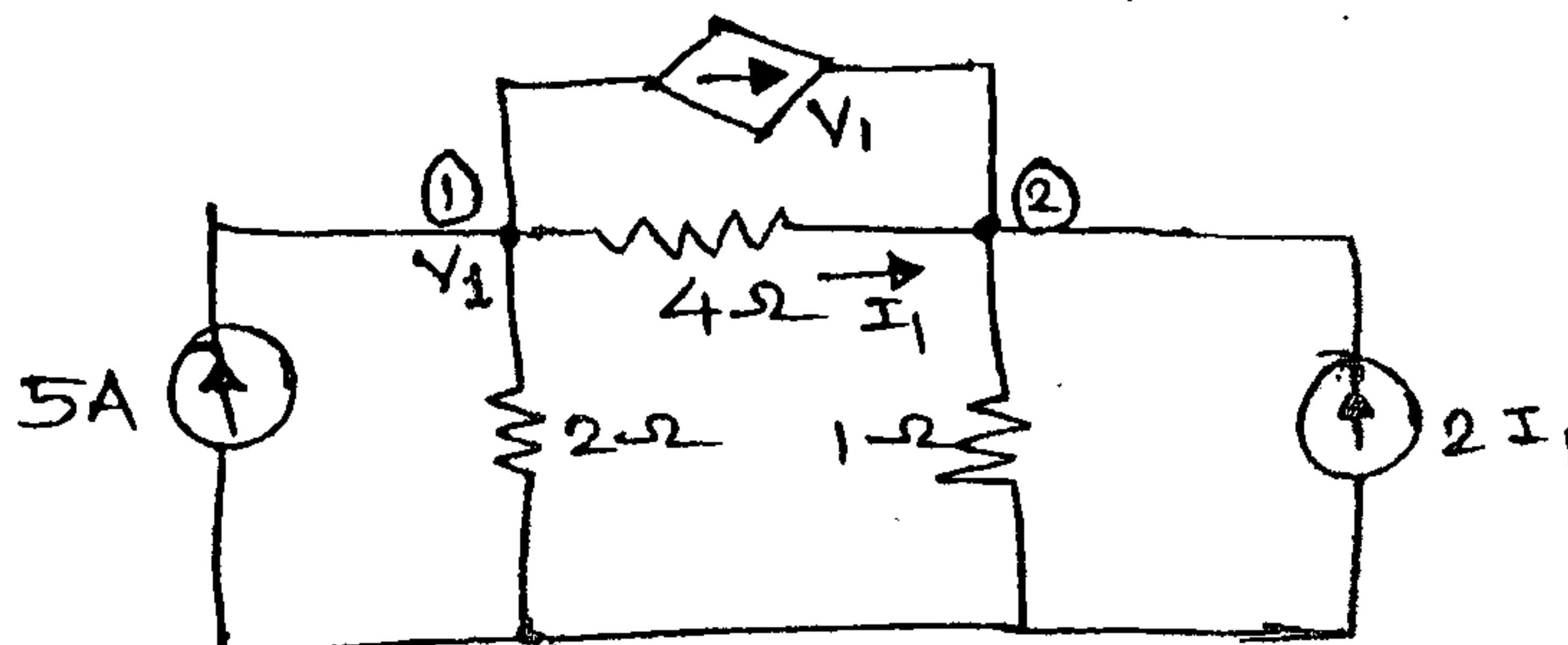


figure (j)

[TURN OVER

(b) Find the response of $V_0(t)$ for network shown in figure (k).

10

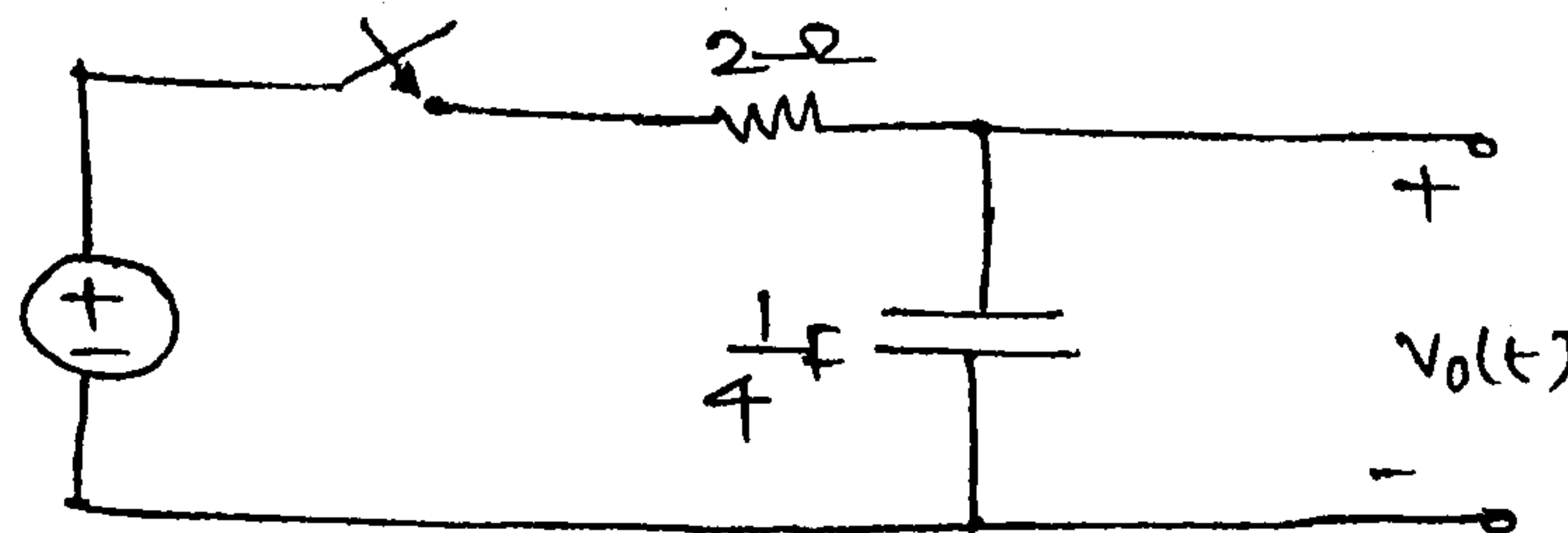


figure (k)

7. Realize the given expression in Foster I, Foster II, Cauer - I and Cauer - II form. 20

$$z(s) = \frac{s(s+4)(s+8)}{(s^2+7s+6)}$$
