Sem III CBGS Circuit Theory ETRX
08/12 11Q

QP Code :14641

(3 Hours) **[Total Marks : 80]**

N.B. : (1) Question No. 1 is Complusory
(2) Attempt any three quesitons from the remaining
(3) Figures to the right indicate full marks.
(4) Assume suitable data if required
(5) Use Smith Chart For transmission line problem.

1. (a) Test for following polynominal using continued fraction expansion only **20**

Routh Hurwitz

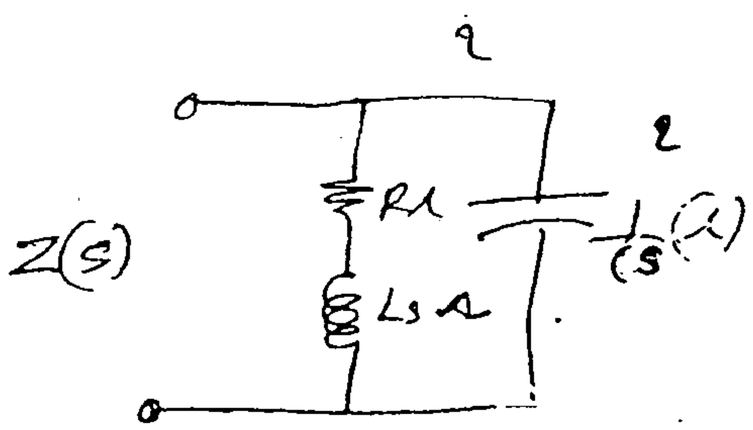
$$P(s) = s^6 + 2s^5 + 3s^4 + 4s^3 + 3s^2 + 2s + 1$$

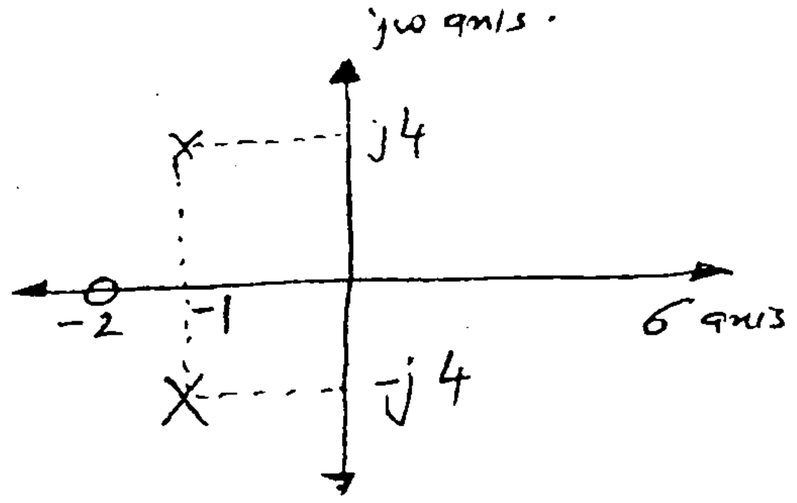
(b) Obtain s-domain equailant model at inductor and capacitor with non-zero intial condition.

(c) The paranelex of a transmission line are G = 2.25 m Ω /km, R = 65 Ω /km, L = 1.6 m H/ km, C=.1 μ F/km find charterstic impedance and the propogation constant of the line at a frequency of 1 KHz.

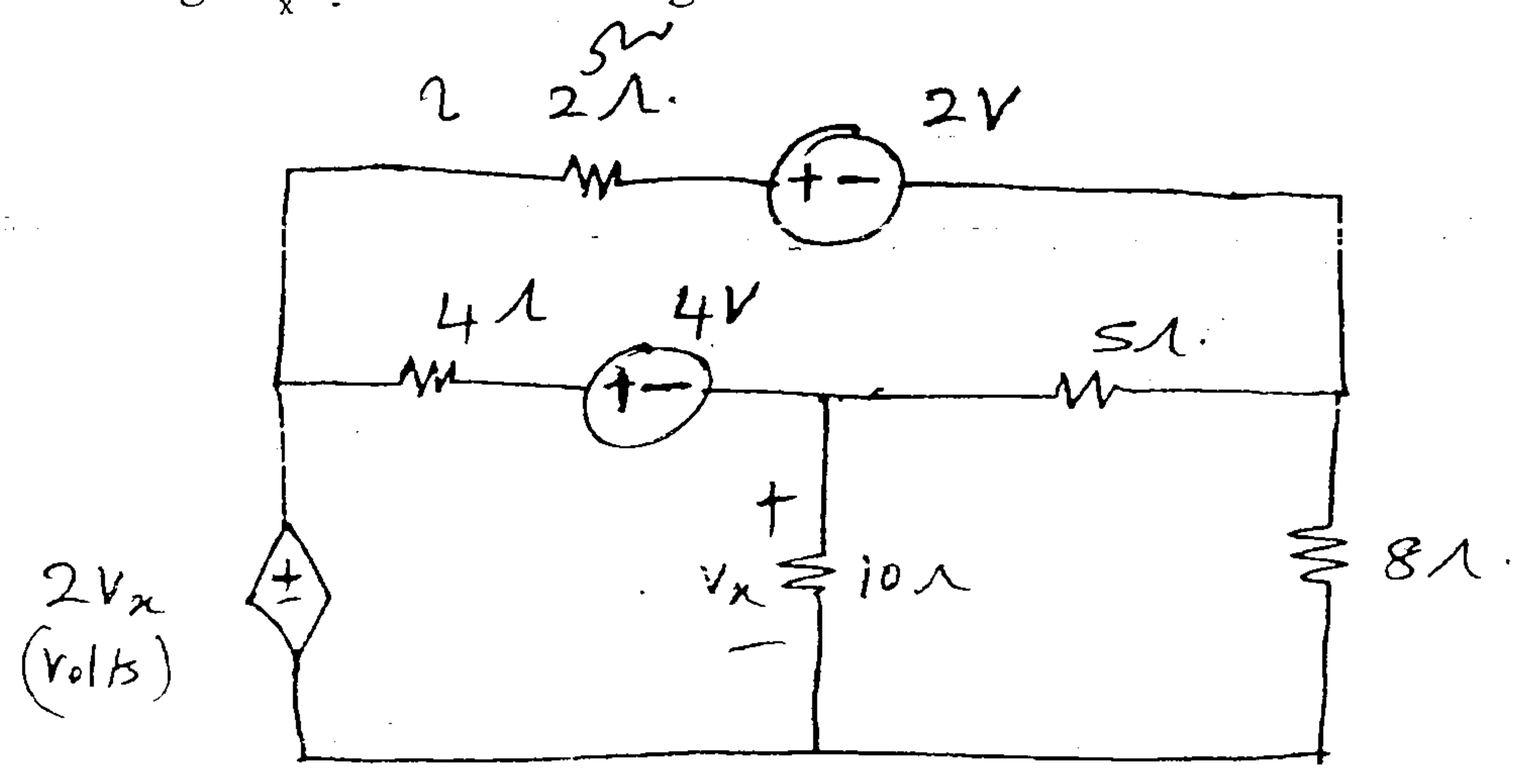
v = rho/ C = 0.1 μF/km

(d) The ploe -zero diagram of driving point impedacne funtion is shown At d.c. the input inpedance is resistive and equal to 2 Ω Determine value of R, Land C.





2. (a) Determine voltage V_x by Source shifting and Source transformation. **8**



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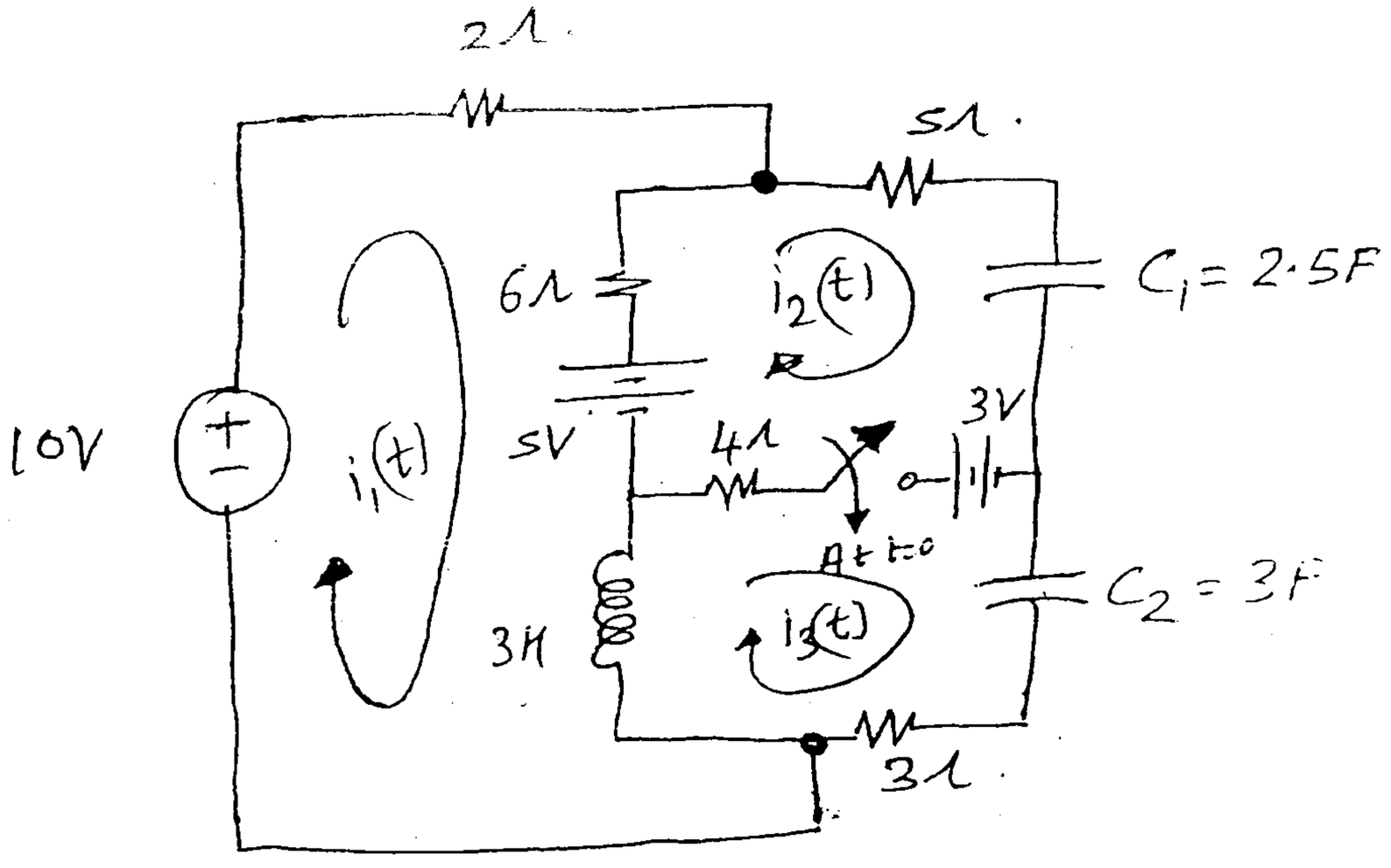
(b) Find $i_1(t)$, $i_2(t)$ and $i_3(t)$ at t= 0⁻ 8

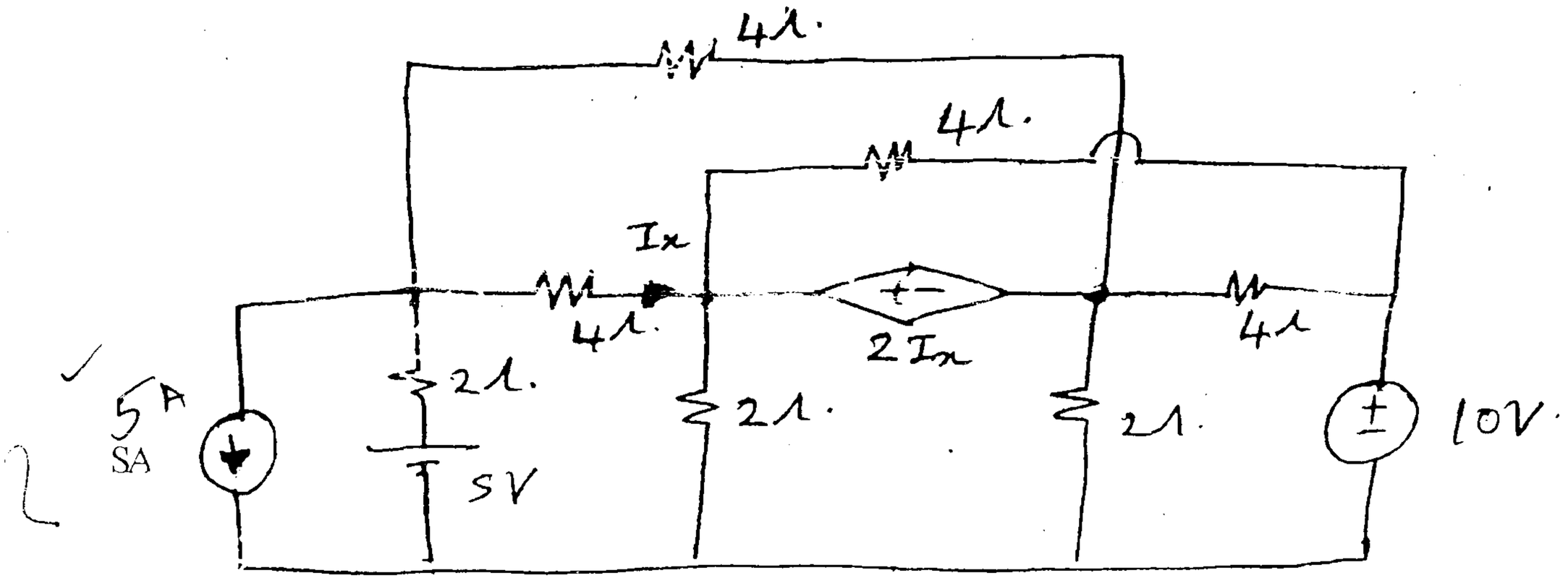


(c) Compare Foster form I and Foster Form II of an LC N/W 4

$$z(s) = \frac{6s(s^2+4)}{(s^2+1)(s^2+64)}$$

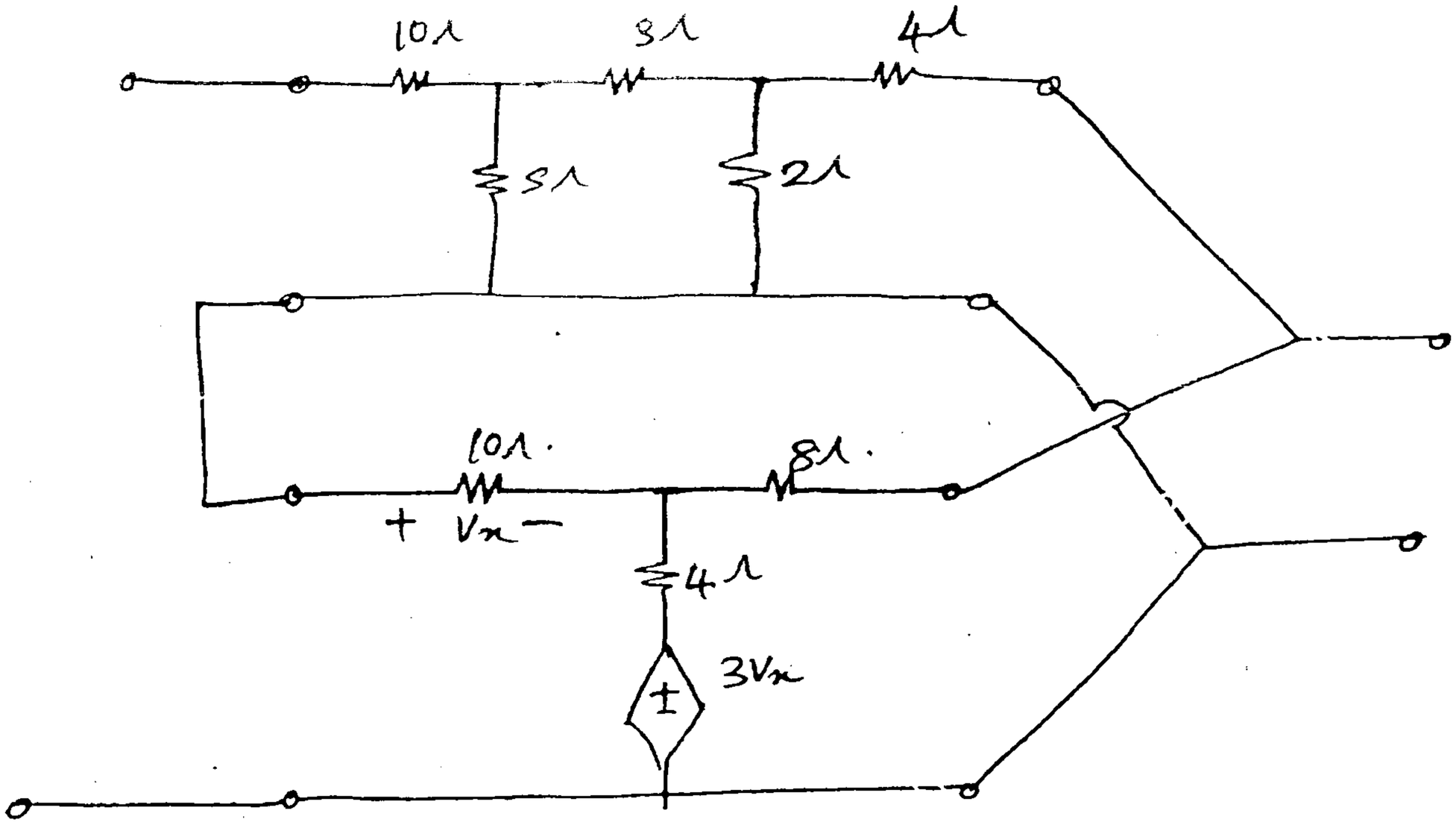
3. (a) Design a short circuit shunt stub match for $Z_L = 150\text{-}200j\ (\Omega)$ for a line of $z_0 = 100\,\Omega$ and frequency at f = 20 mHz use Smith chart. 8

(b) Obtain Power associated with dependent voltage source by using Nodal analysis. 8

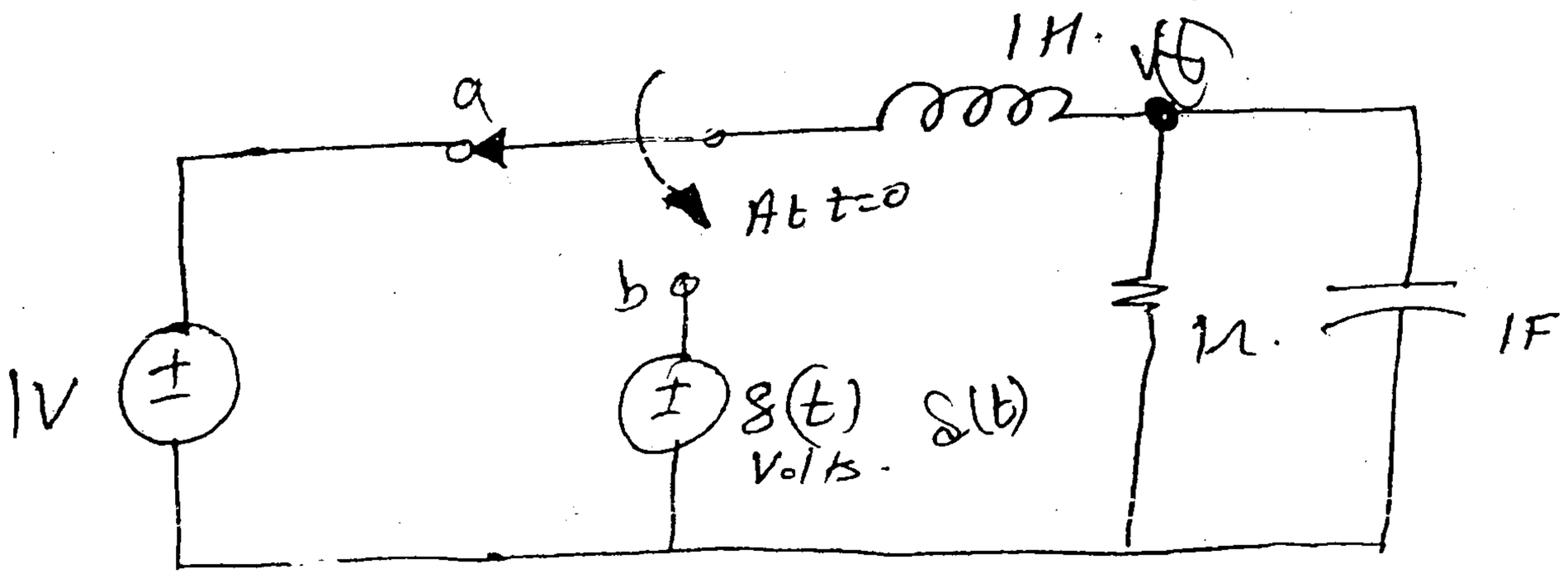


(c) Explain various types of filter's 4

4. (a) Obtain hyprid parameter of the inter connected network. 10



(b) Obatin v(t) for t ≥ o Use Laplace Transform method. 10

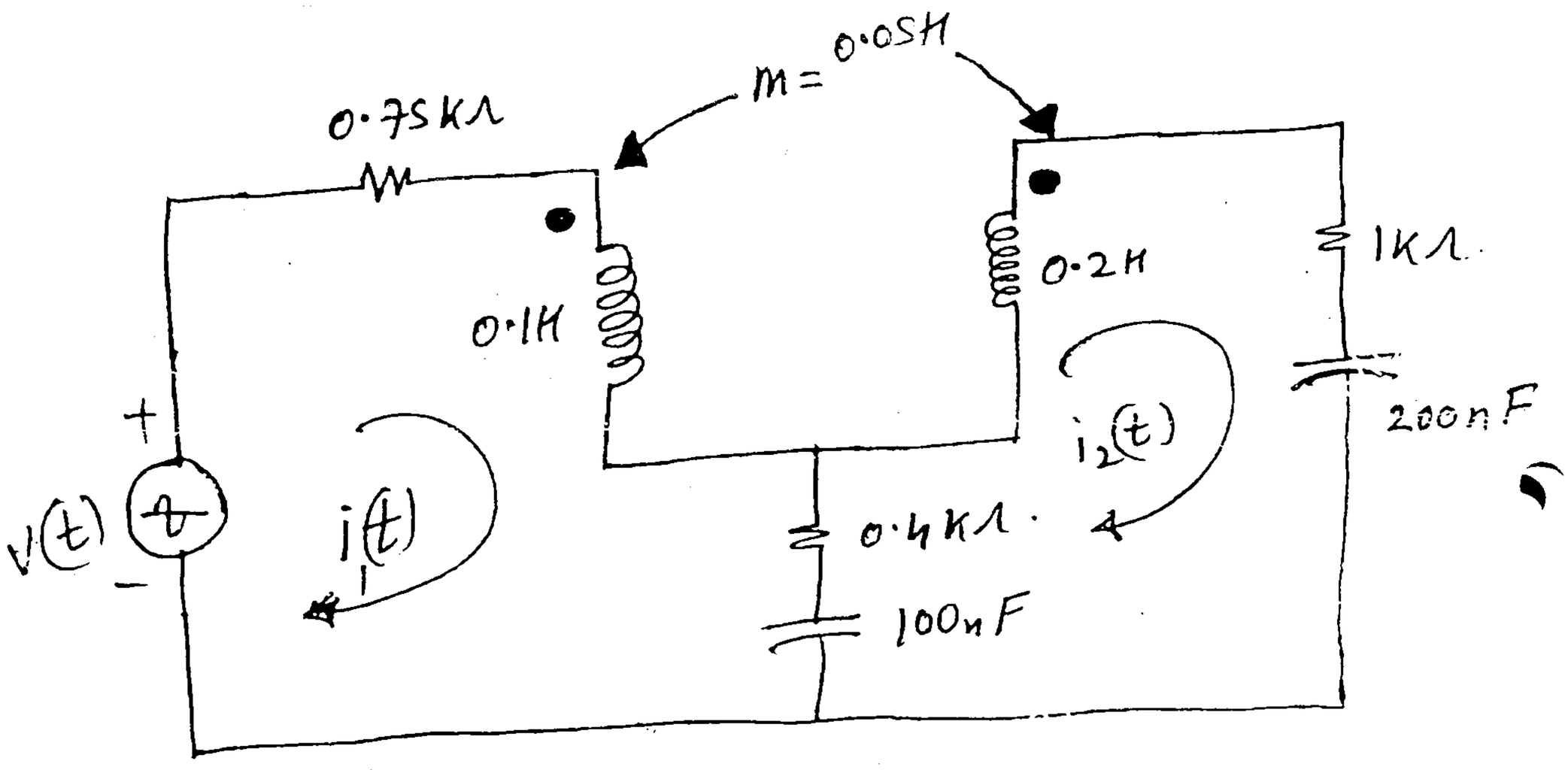


5. (a) Check for p.r.f. 8

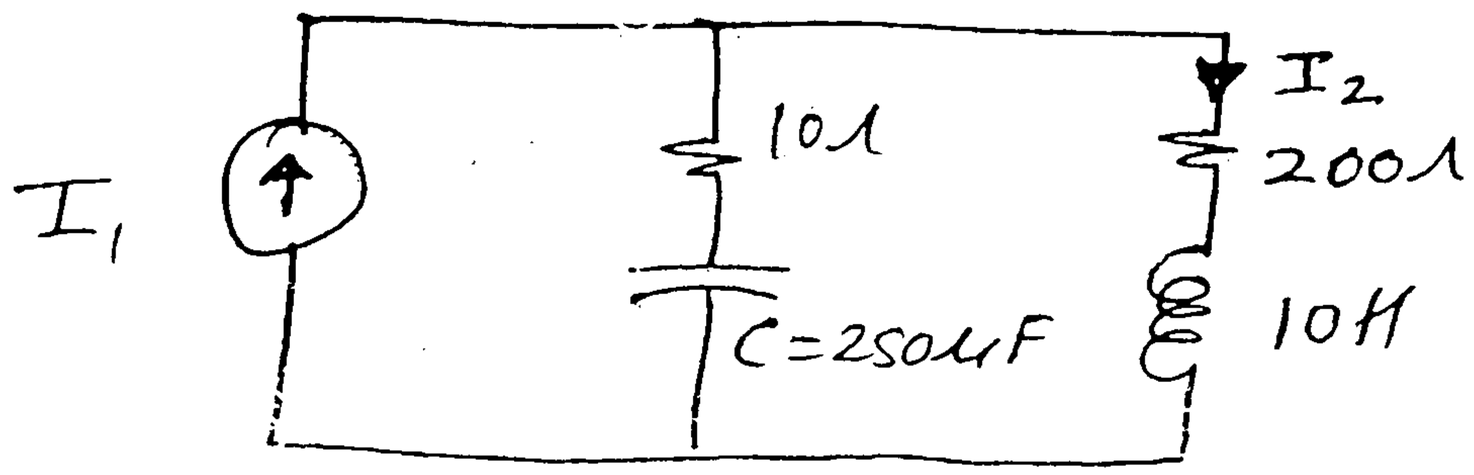
a) $F(s) = \frac{2s^2 + 2s + 1}{s^3 + 2s^2 + s + 2}$

b) $F(s) = \frac{s^2 + 2s + 1}{s^3 + 2s^2 + 2s + 3}$

(b) Find current flowing in both coils. If applied input voltage is v (t)= 230 $\sqrt{2}$ sin [5000 t-30^0]



5. (C) Obtain pole -zero plot for $\frac{I}{I_1}$ $\eta = \frac{I_2}{I_1}$



6. (a) For the Network shown below determine R_L for maximum power transfer and also determine P_L 8

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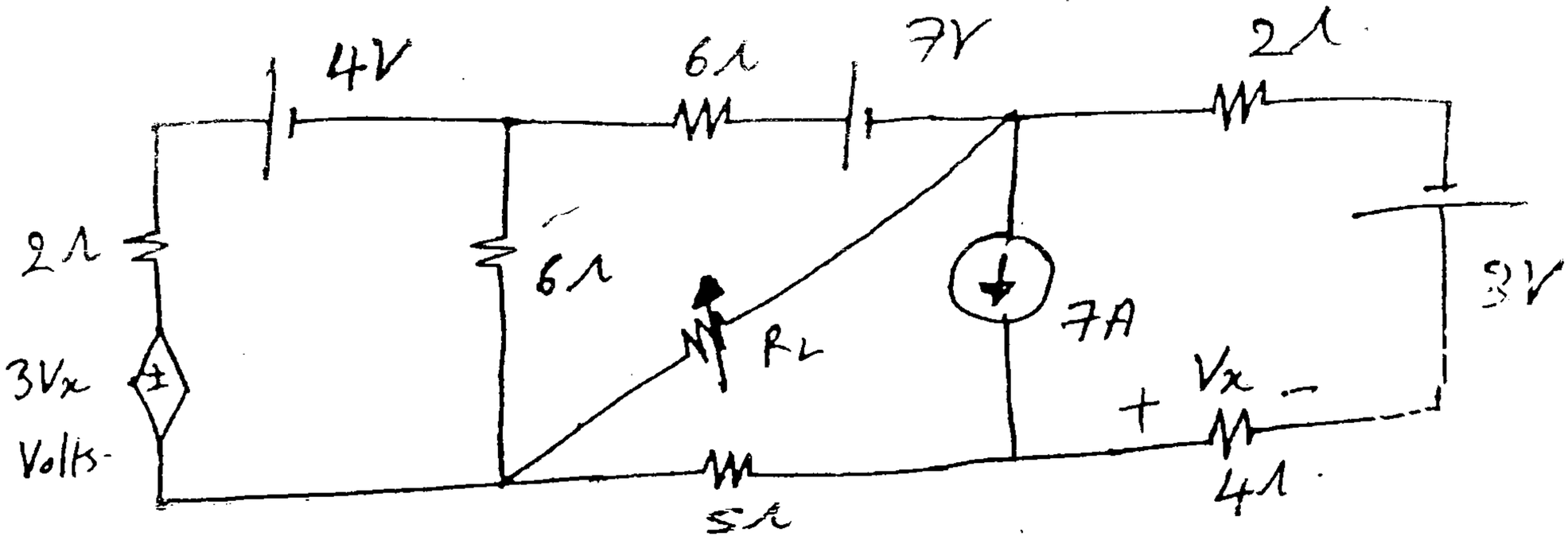
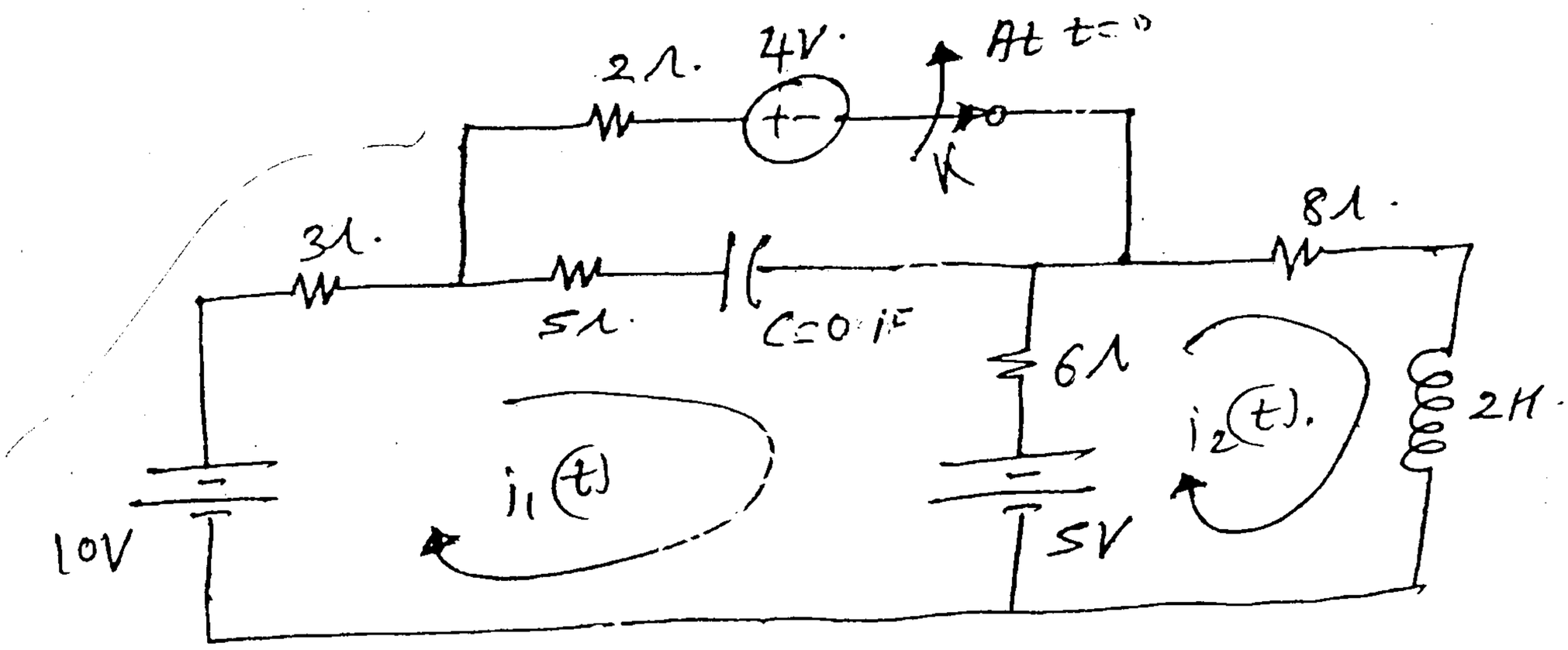


6. (b) Find $i_1(t)$, $i_2(t)$ $\frac{di_1(t)}{dt}$ and $\frac{di_1(t)}{dt}$ and $\frac{di_2(t)}{dt}$ at $t = 0^+$ if switch k is opened at t=0 8



6. (c) Compare Cauer form I and Cauer form II for RC N/W 4

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

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