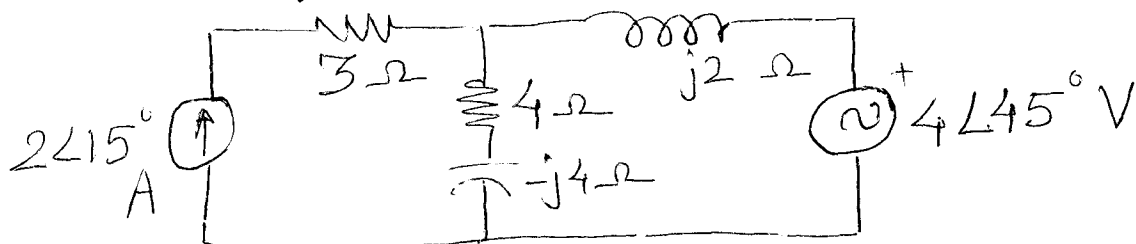


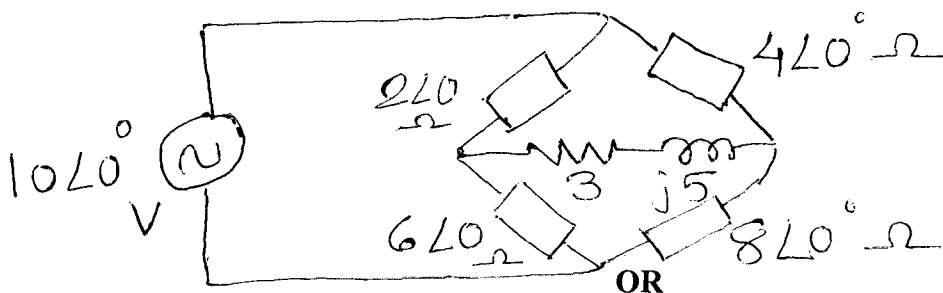
**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.

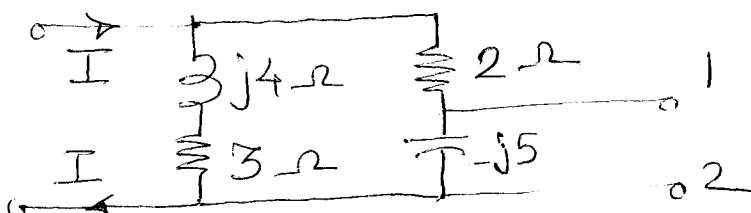
**Q.1 a)** Find the voltage drop across  $4 \Omega$  resistor in the following network using (05) mesh analysis.



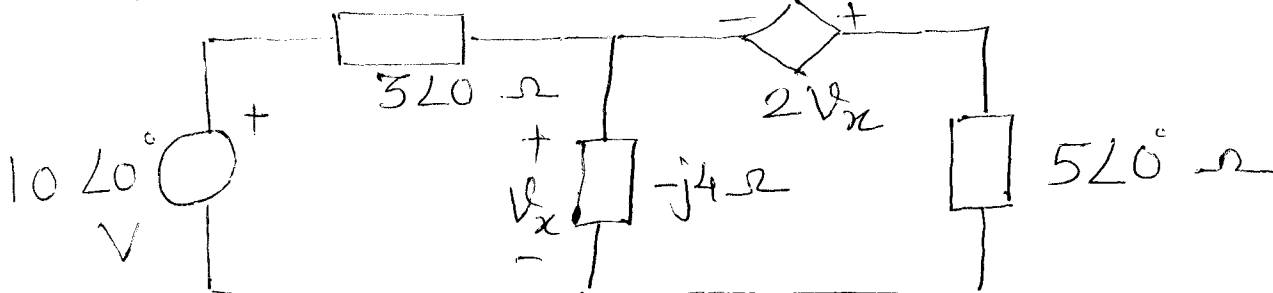
**b)** Using Thevenin's theorem, find the current through  $(3+j5) \Omega$  in the bridge (05) circuit.



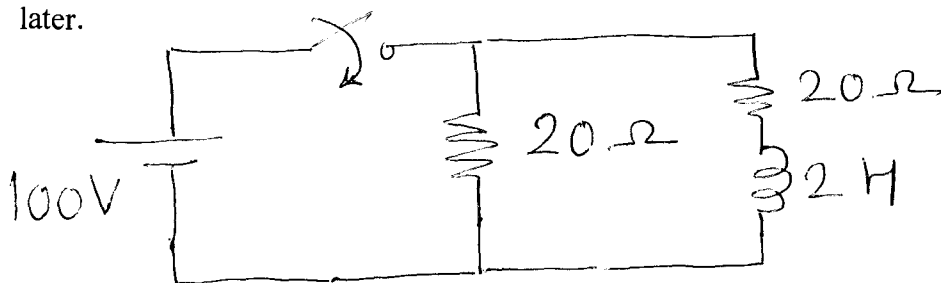
**Q.1 a)** Find Norton's equivalent circuit for network shown below at the left of (05) terminals 1-2 assume  $I=5\angle 0$  Amp.



**b)** Determine values of  $I_1$  &  $I_2$  in the following circuit by mesh analysis. (05)



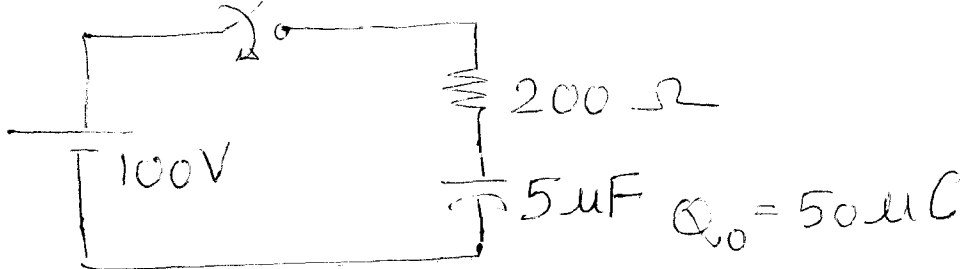
**Q.2 a)** Steady state condition is reached with 200V dc source at  $t=0$ . Switch k is suddenly opened, find the expression of current through inductor 0.5 sec later. (05)



- b) A coil having resistance of  $20 \Omega$  & inductance of  $5H$  is switched ON to direct voltage of  $200V$  calculate, rate of change of current. (05)
- at the instant of closing switch.
  - When  $t = \frac{L}{R}$
  - Also find steady state value of current.

OR

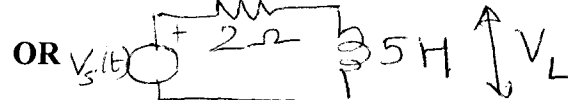
- Q.2 a) The  $5\mu F$  capacitor from RC circuit as shown below has initial charge of  $50 \mu C$  with polarities as shown. At  $t=0$ , the switch being closed, a dc voltage of  $100 V$  is applied. Find the expression of current. (05)



- Q.2 b) Derive the expression of charging & discharging current in case of series RC circuit having DC excitation only. (05)

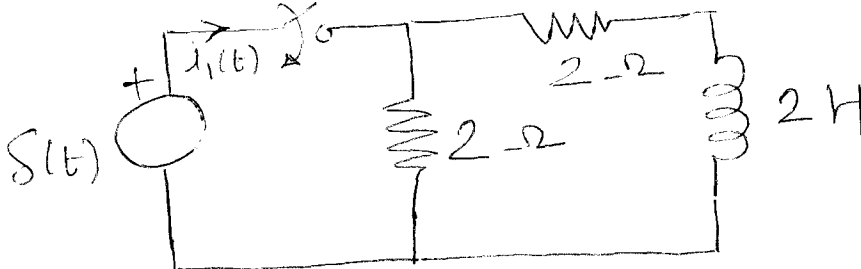
- Q.3 a) Derive the expression of current when step response is applied to series R-L circuit. (05)

- b) Determine the expression of  $V_L(t)$  when  $V_s(t) = \delta(t)$  i.e. when input applied is impulse signal. (05)



- Q.3 a) Derive the expression of current when step response is applied to series RC circuit. (05)

- b) Find the impulse response of current  $i(t)$  in following network. (05)



- Q.4 a) Express ABCD parameters in terms of Y parameters. (05)

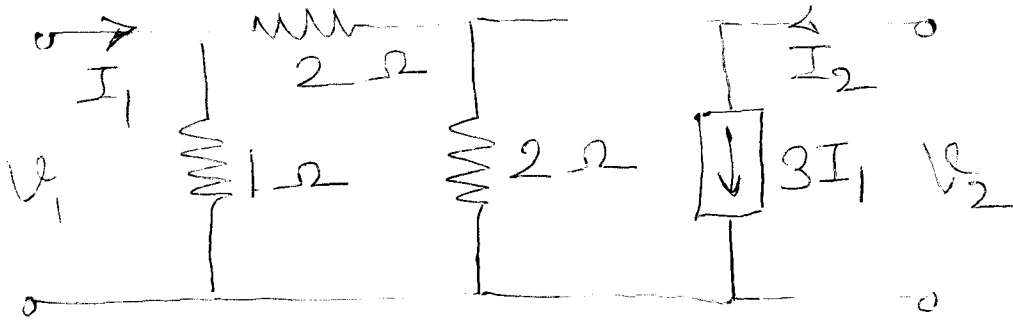
- b) For the following readings observed, find Z parameters (05)

	$V_1$	$V_2$	$I_1$	$I_2$
Output port open	100 V	60 V	10 A	0
Input port open	30 V	40 V	0	3 A

OR

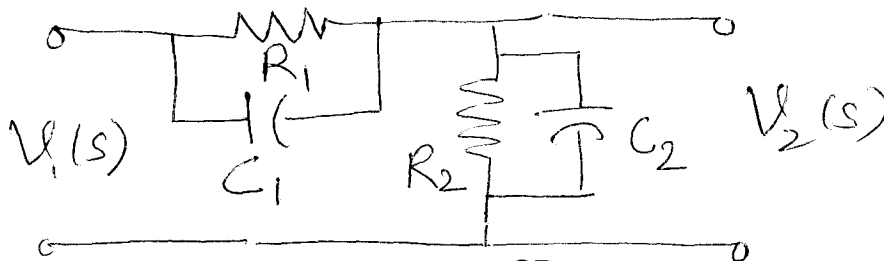
- Q.4 a) Draw a neat labeled basic equivalent circuit for Z parameters (05)

b) Find Y and Z parameters for the network. (05)



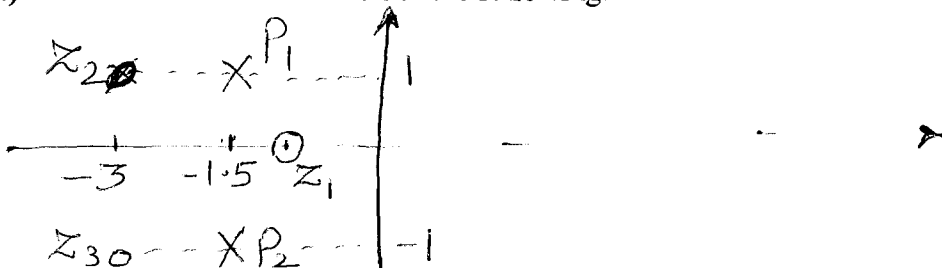
Q.5 a) Discuss the restrictions on poles and zeros for driving point function. (05)

b) Find the voltage ratio transfer function for the network shown (05)

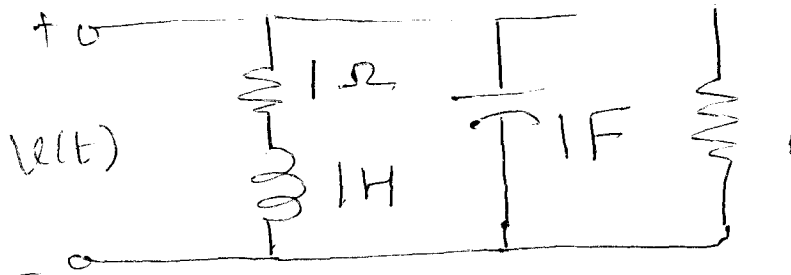


OR

Q.5 a) Find the transfer function of the following. (05)

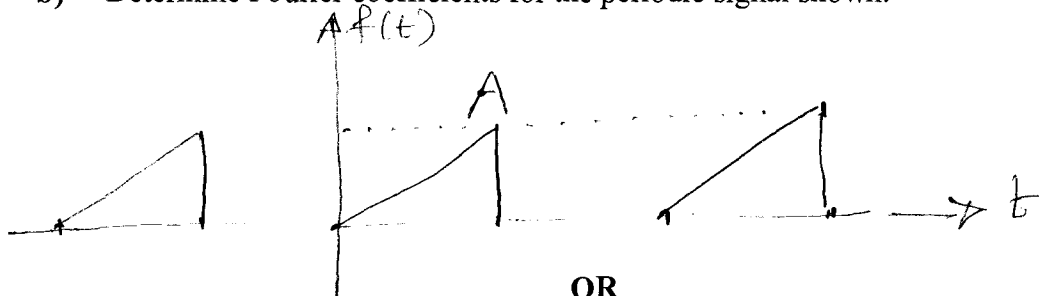


b) Find Y(S) and also obtain pole zero plot for it. (05)



Q.6 a) Discuss any two properties of Fourier transform in detail. (05)

Q.6 b) Determine Fourier coefficients for the periodic signal shown. (05)



OR

Q.6 Explain the following in concern with Fourier series (10)

- i) Even and odd symmetry
- ii) Half wave symmetry
- iii) Periodic wave form