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

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

(2) Attempt any three from the remaining questions.

(3) Figures to the right indicate full marks.

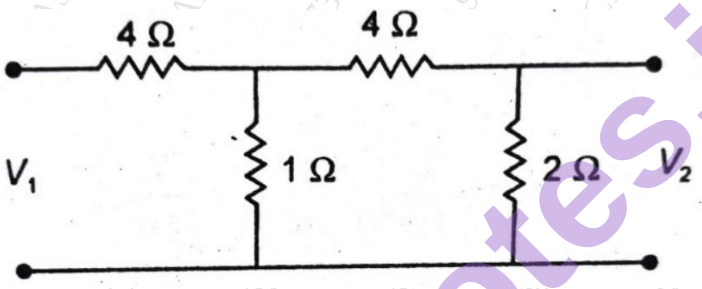
(4) Each question is of 20 Marks.

Q1. Answer ANY FOUR.

a) Define pole and zero for a network function and draw a pole zero plot for, **05**

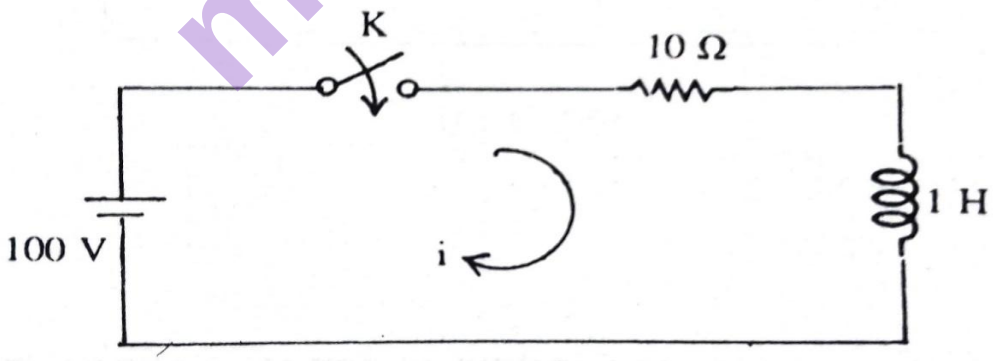
$$I(s) = \frac{4(s+4)}{(s+1)(s^2+5s+6)}$$

b) For the given network, determine the open circuit impedance parameters 05



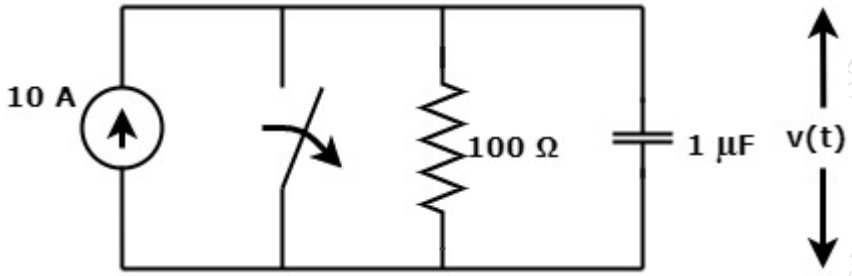
c) Derive condition for symmetry and reciprocity for transmission (A-B-C-D) parameters. **05**

d) In the given network switch is closed at *t=0*. With zero current in the inductor, find i *and* $\frac{di}{dt}$ at *t=0+*. **05**



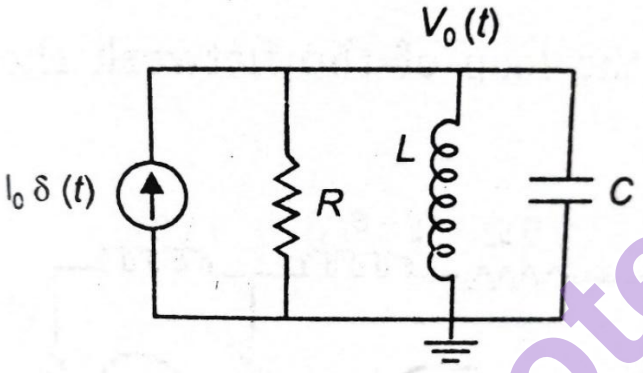
Q 2a) Derive ABCD parameters in terms of Y parameters and hybrid parameters

b) In the circuit shown, the switch was closed for long time and at t=0 it is opened. Determine $v(t)$, $\frac{dv(t)}{dt}$ and $\frac{d^2v(t)}{dt^2}$ for $t = 0^+$. **10**

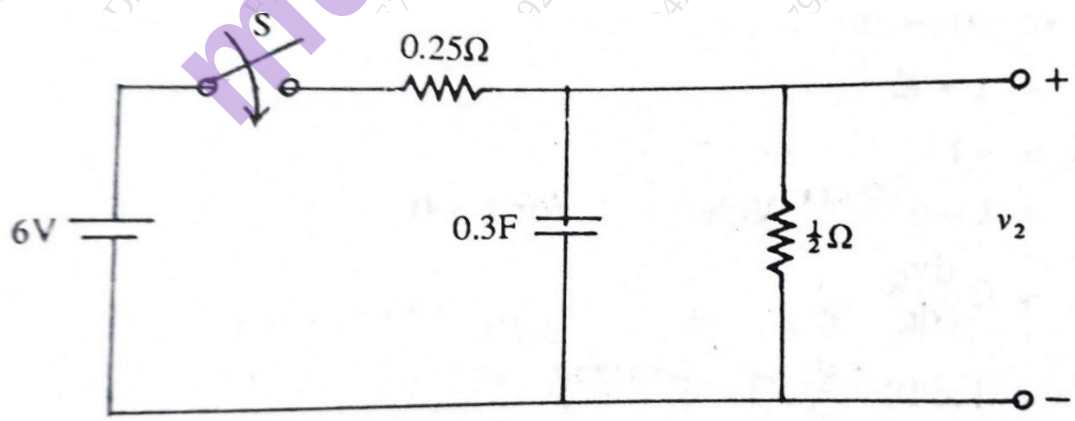


10

Q3 a) Determine the voltage across the parallel combination in the given circuit when it is connected across a current source $I_0\delta(t)$

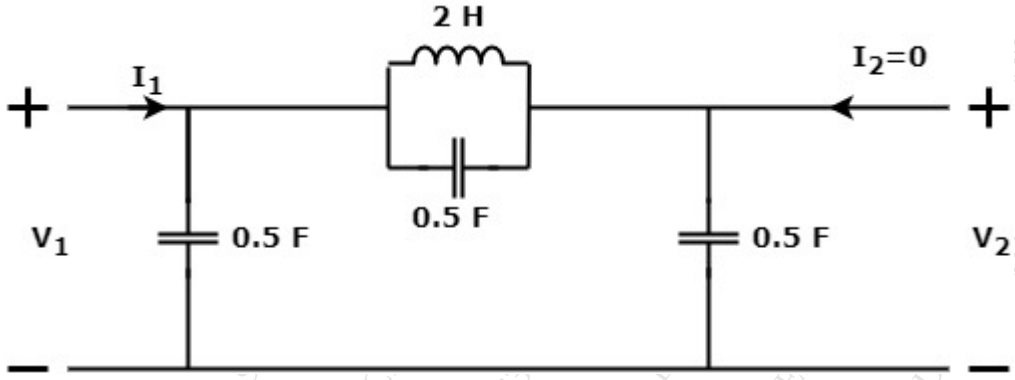


b) For the given network switch 's' is open for a long time and at t=0 it is closed. Determine V_2 using the analysis in time domain.



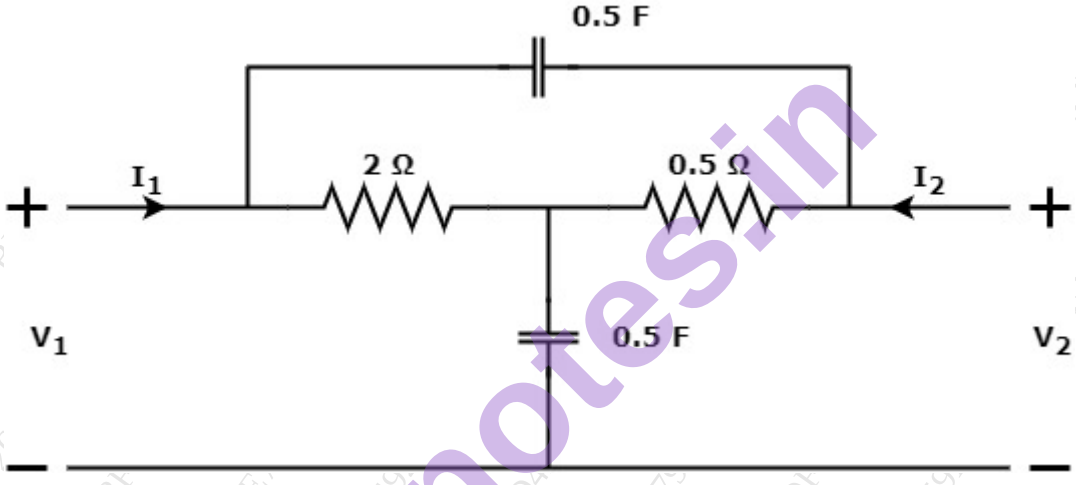
Q 4

a) For the circuit shown, determine $\frac{V_1}{I_1}$ and $\frac{V_2}{I_1}$. **10**



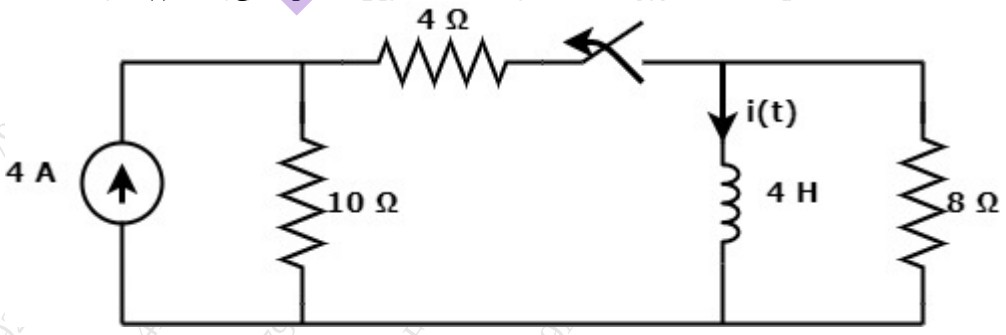
10

b) Determine admittance parameters for network shown below.



Q 5

a) In the below circuit, switch was closed for a long time and at t=0 it is opened. Calculate i(t) using Laplace Transform. **10**

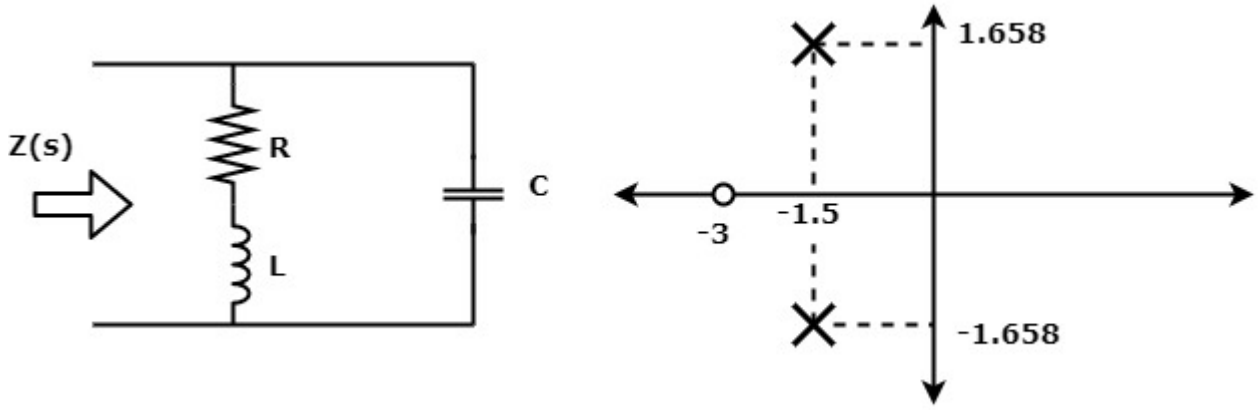


10

b) Write down restrictions on Pole and Zero Locations for Driving-Point Functions and Transfer Functions.

Q 6

a) For the impedance function of the network shown, the pole zero plot is as given with $z(j0) = 1$. Determine values of R, L and C. **10**



b) In the network shown in figure at t=0, the switch is opened. calculate v, dv/dt and d^2v/dt^2 at $t=0^+$ **10**