

Q.P. Code :22707

[Time: Three Hours]

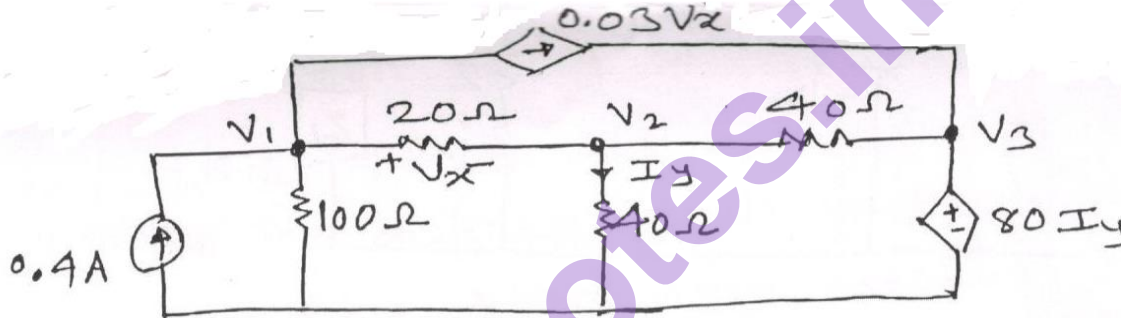
[ Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question.No.1 is compulsory.
  2. Attempt any three questions out of the remaining five questions.
  3. Figures to the right indicate full marks.
  4. Assume suitable data wherever required but justify the same.

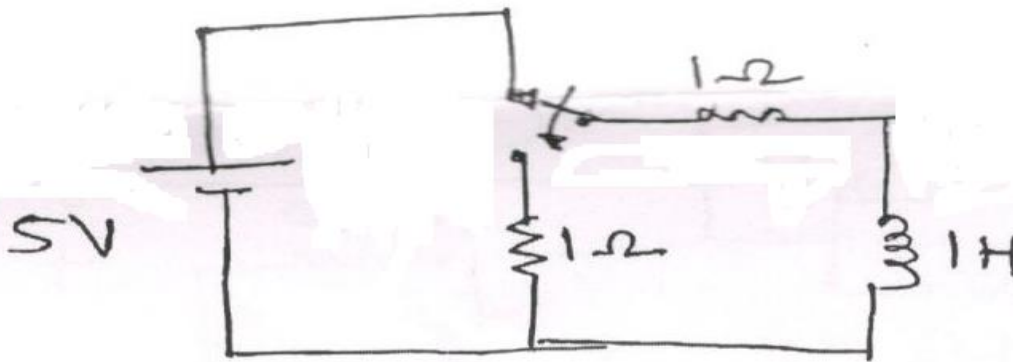
Q.1 a) For the circuit shown in fig. find  $v_1$  and  $v_2$  using Nodal Analysis.

05



b) Find  $i$ ,  $\frac{di}{dt}$  and  $\frac{d^2i}{dt^2}$  at  $t = 0^+$  for the Network

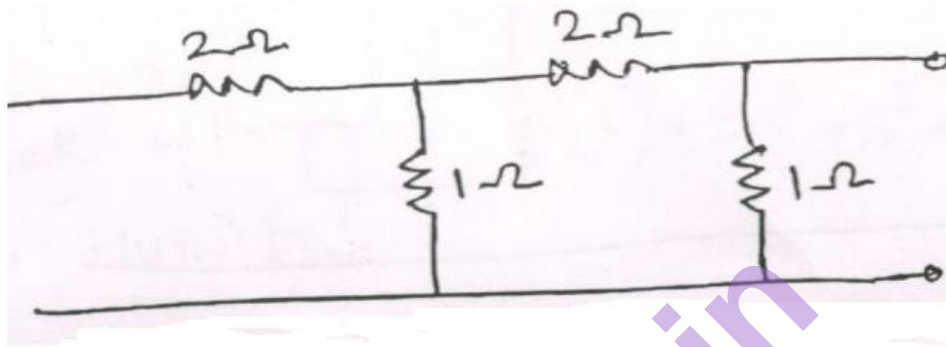
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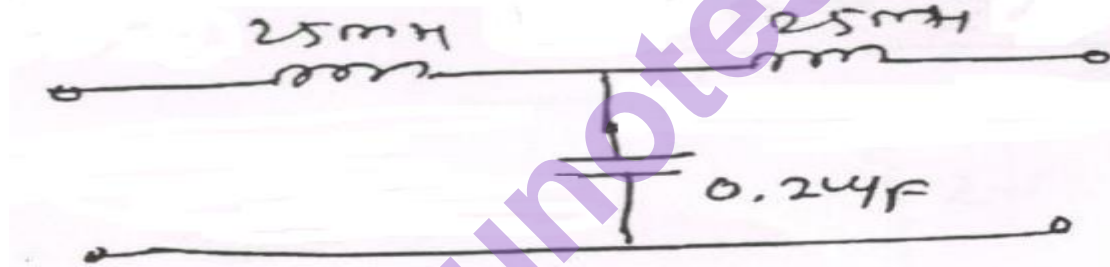
c) Determine h parameters of the network given.

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d) Find nominal impedance, cut-off frequency and passband for the network shown.

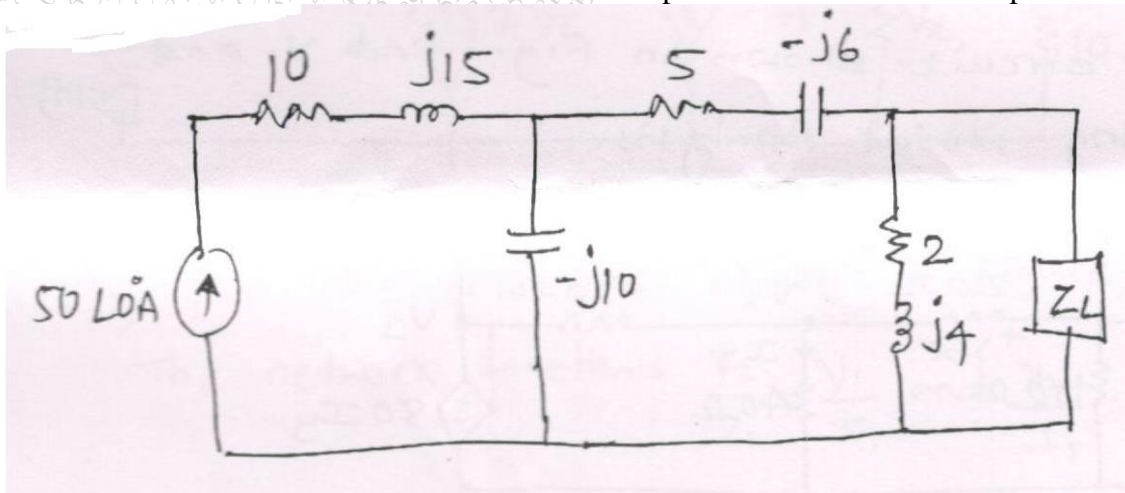
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Q.2

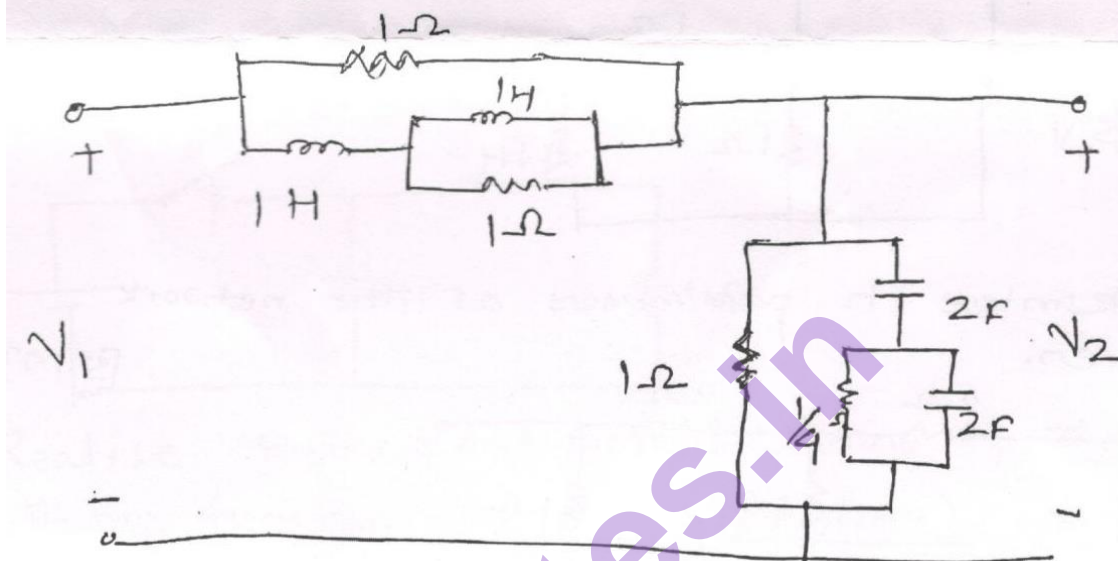
a) Find out value of  $Z_L$  that will receive the maximum power. Also determine the power

08



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- b) For the network shown in Fig. prove that the input impedance of port 1 is  $|\Omega$  and also find the voltage Transfer function. 08



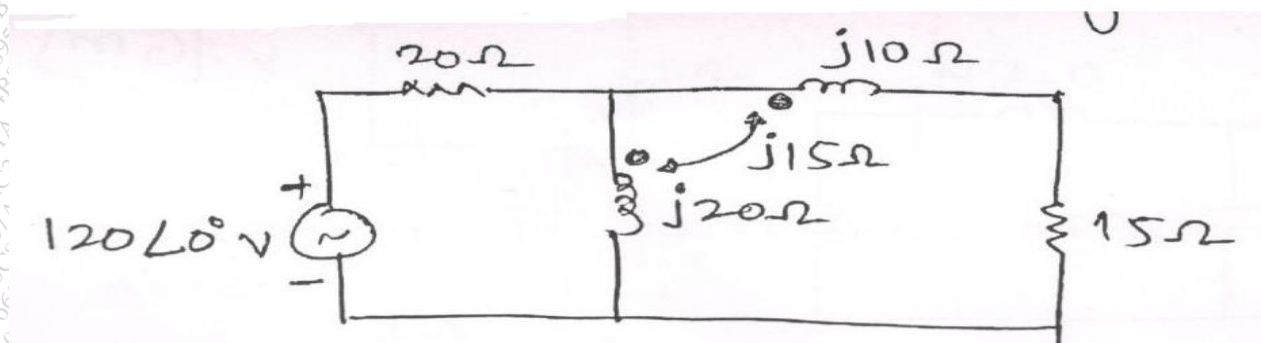
- c) Test whether gives Function  $F(s)$  is positive Real function or Not. 04

$$f(s) = \frac{s^3 + 6s^2 + 7s + 3}{s^2 + 2s + 1}$$

- Q.3 a) Derive condition for reciprocity in terms of Z parameters and symmetry in terms of H parameters 10

- b) Design constant K-low pass filtes using  $\pi$  section having cut-off frequency of 4KHz and nominal impedance of 500  $\Omega$ . For the designed circuit, find characteristics impedance, Attenuation constant and phase constant at 2000 Hz and 6000 Hz 10

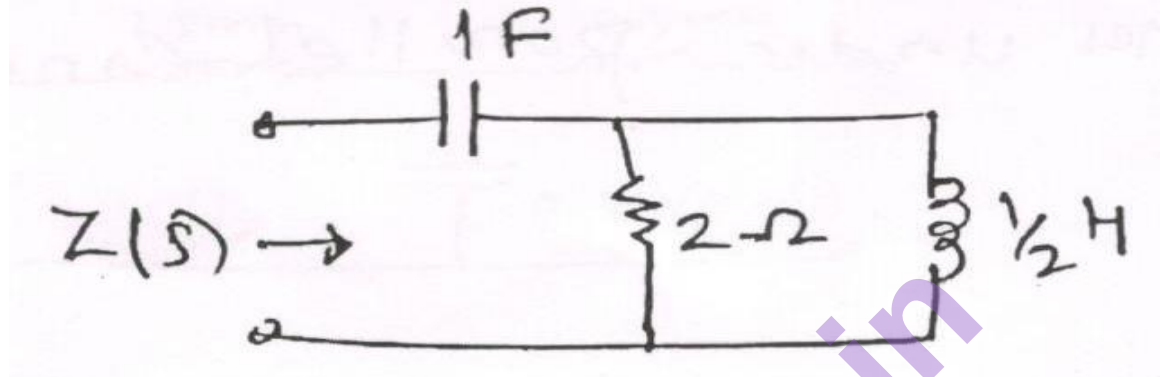
- Q.4 a) Find the voltage across the 15  $\Omega$  resister in figure using mesh analysis. 08



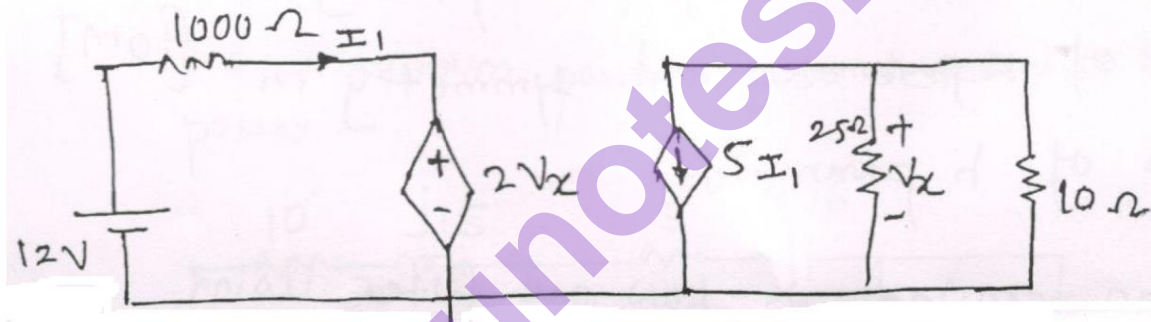


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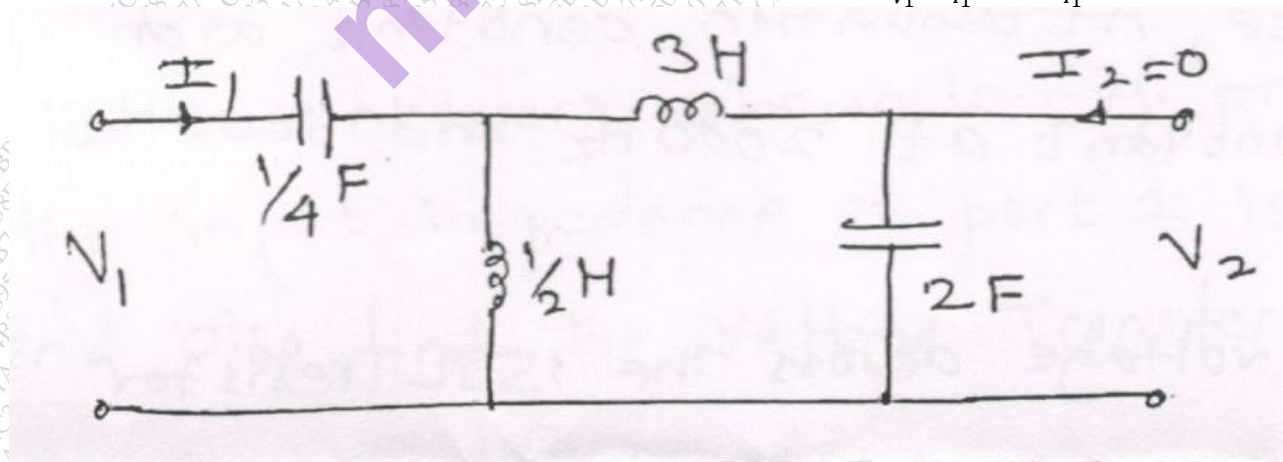
- b) Check whether  $P(s) = 2s^6 + s^5 + 12s^4 + 6s^3 + 56s^2 + 25s + 25$  is Hurwitz. 06
- c) Find poles and zertos of the impedance of the network shown and plot them on the S-Plane 06



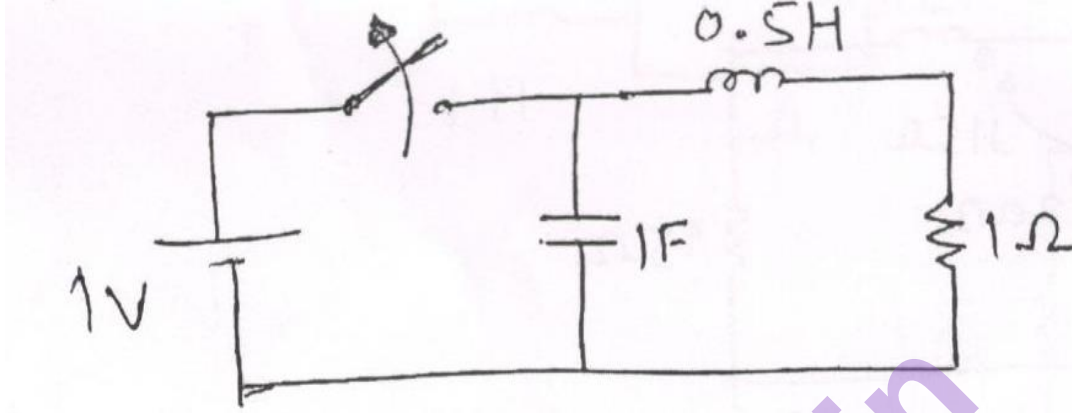
- Q.5 a) Find current Through  $10\ \Omega$  resistor using Norton's Theorem. 10



- b) For the network shown in figure, find the network function's  $\frac{V_2}{V_1}$ ,  $\frac{V_1}{I_1}$  and  $\frac{V_2}{I_1}$  10



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Q.6 a) Find  $i(t)$ b) Realise Fostes I and Fostes II form of the following function.  $Z(s) = \frac{2(s+2)(s+4)}{(s+1)(s+3)}$ 

c) Derive the relation between the input and output questions of the two interconnected 2-part networks under parallel Connection