National Institute of Technology, Hamirpur (HP)

End Semester Examination (December-2022)
Name of the Examination: B.Tech. Third Semester

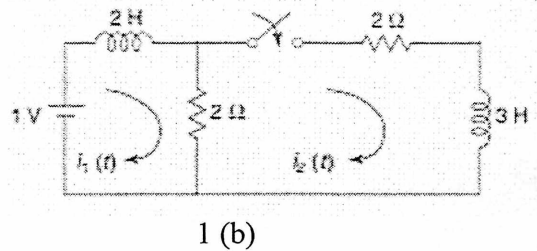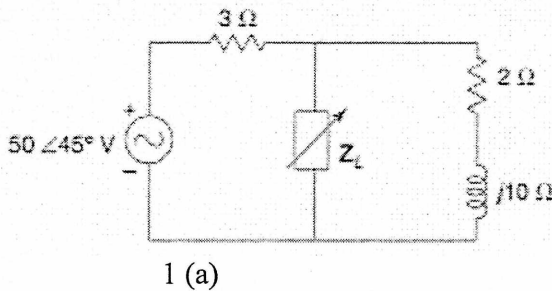Course Name : Network Analysis and Synthesis   Course Code : EE-211

Time: 3 Hours   Maximum Marks: 50

Note:
1. All Questions are compulsory 2. Draw the relevant diagrams/figures
3. Assume data wherever required

Q1. **A.** Find the impedance Z_L so that maximum power can be transferred to it in the network of Fig.1 (a). Find maximum power. (5)

1 (a)   1 (b)

B. In the network shown in Fig. 1 (b), the switch is closed at t = 0, the steady-state being reached before t = 0. Determine current through inductor of 3 H. (5)

Q2. **A.** For the network of Fig. (a), draw the graph and write a tie-set schedule. Using the tie-set schedule obtain the loop equations and find the all branches. (5)

2 (a)   Fig. 3 (b)
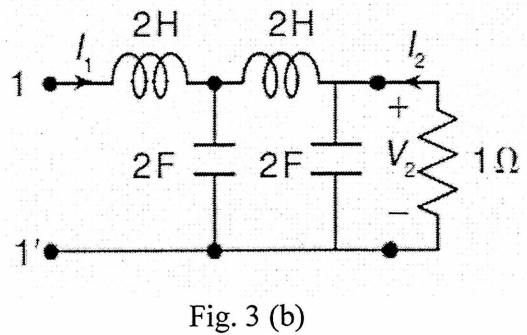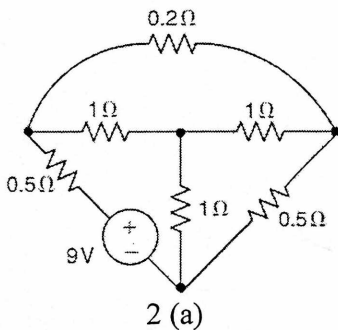
Q3. **A.** The transform voltage of a network is given as (5)

$$V(s) = \frac{3s}{(s+2)(s^2+2s+2)}$$

Draw its pole-zero diagram and hence obtain $V(t)$.

B. Find the current transfer and voltage transfer ratio of the networks shown in Fig. 3(b) (5)

Q4. A. For the network shown in Figure 4(a), find the A, B, C and D parameters. (5)
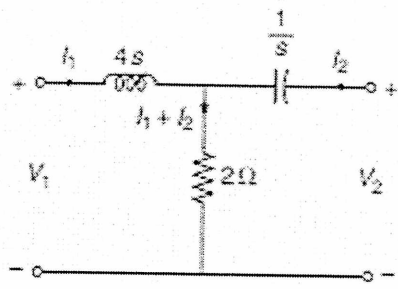

Fig. 4 (a)

B. Express the reciprocity and symmetry criteria in term of hybrid and inverse transmission parameter of two port network. (5)

Q5. A. Test the polynomial $P(s)$ of Hurwitz property. (5)

$$P(s) = s^6 + 3s^5 + 8s^4 + 15s^3 + 17s^2 + 12s + 4$$

B. Realize all Foster and Cauer forms of the following impedance function (10)

$$Z(s) = \frac{4(s^2+1)(s^2+9)}{s(s^2+4)}.$$