EE225 Network Theory
Tutorial Problems- Set Six

August 23, 2017

Note: The element values for all the following problems are in ohms (Ω) for resistance, Henrys (H) for inductance and Farads (F) for capacitance unless otherwise mentioned.

Q1. Find the y- and z- parameters for the two simple networks in Fig. 1 if they exist.

Q2. The network of Fig. 2 contains a current controlled current source. Obtain the y- and z- parameters if they exist.

Q3. Find the y- and z- parameters for the resistive network containing a controlled source as shown in Fig. 3.

Q4. The network of Fig. 4 contains both a dependent current source and a dependent voltage source. For the element values given determine the y- and z- parameters.

Q5. Find the y- and z- parameters for the RC ladder of Fig. 5.

Q6. The network of Fig. 6 is a bridged-T RC network. For the values given, find the y- and z- parameters.

Q7. Determine the ABCD (transmission) parameters for the network of Fig. 7

Q8. The network of Fig. 8 represents a certain transistor over a certain range of frequencies. For this network, determine the

(a) h-parameters

(b) g-parameters

Q9. The network of Fig. 9 represents the transistor of the previous problem over a different range of frequencies. For this network too, determine the

(a) h-parameters

(b) g-parameters

Q10. Obtain the expressions for the standard T-section representation of a two-port network in terms of the h-parameters. Check whether the expressions given in Fig. 10 are correct in that regard.

Q11. The network of Fig. 11 may be considered as a two port network embedded in another resistive network. The resistive network is described by the following short-circuit admittances: $y_{11} = y_{12} =$ 2 mho, $y_{22} = 1$ mho. If I_a is constant and equal to 1 Ampere, find the voltages at the two ports of the network N, V_1 and V_2.

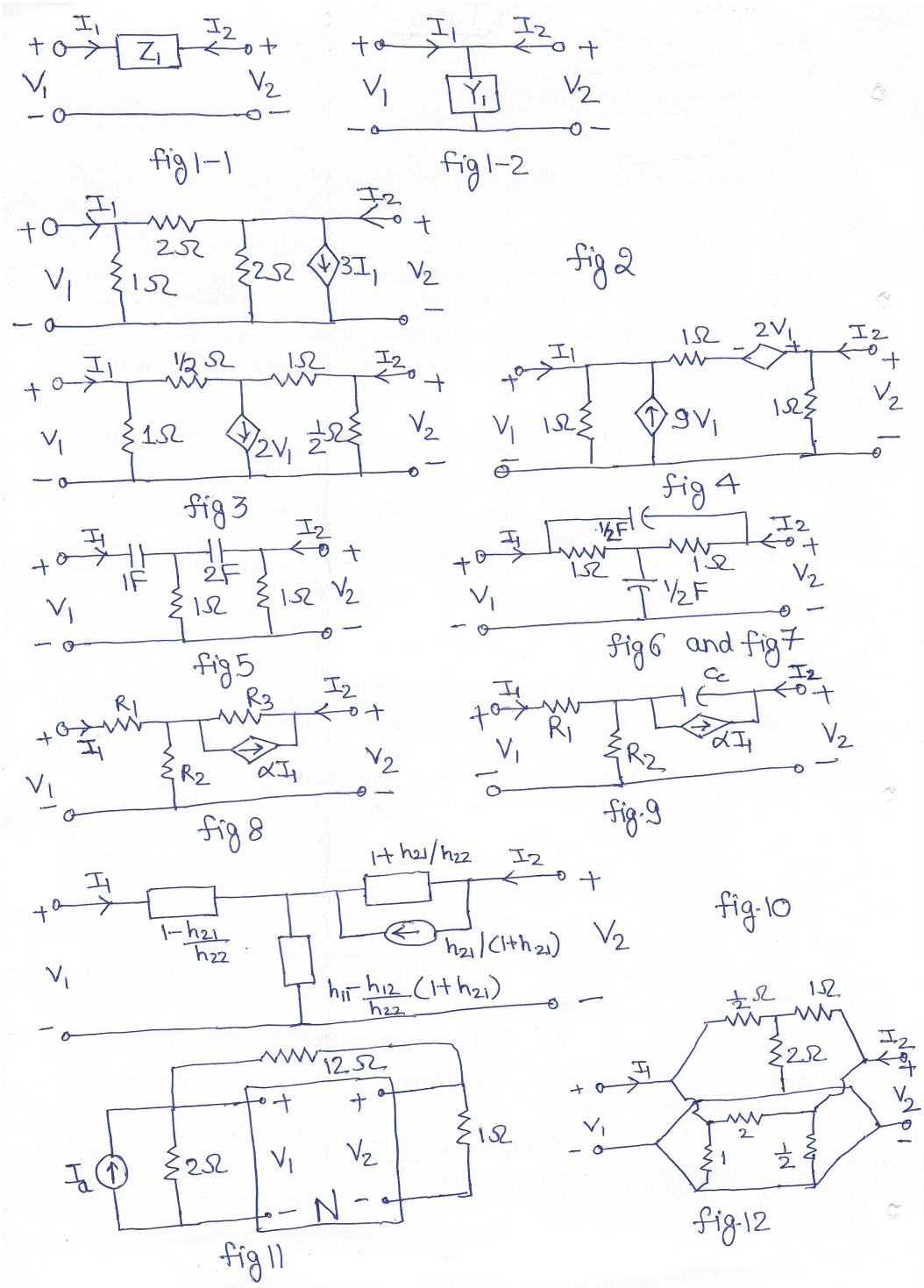
Q12. The network shown in Fig. 12 consists of a resistive T and Π network connected in parallel. For the element values given, determine the y-parameters.

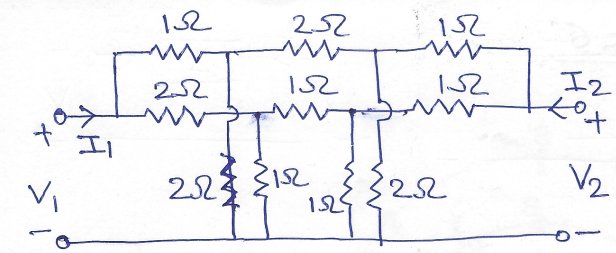
Q13. Analyse the resistive network of Fig. 13 for its y-parameters.

Q14. The network of Fig.14 is of the type used for the so-called "Notch Filter". For the element values that are given, determine the y-parameters.

Q15. Are the two networks of Fig. 15a and 15b equivalent? Justify your assertion. If so, is there an advantage of using one configuration over the other as far as network parameter calculation is concerned?

Q16. Show that the two networks of Fig. 16a and 16b are equivalent under appropriate relations between the parameters Z_1, Z_2, Z_3; and Y_a, Y_b, Y_c. Find these relationships of each set in terms of the other.





fig·13

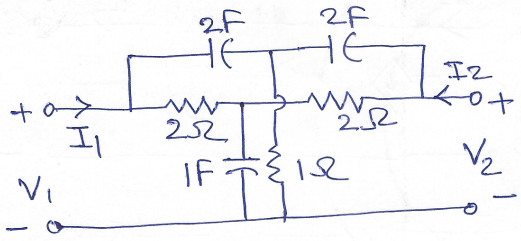


fig 14

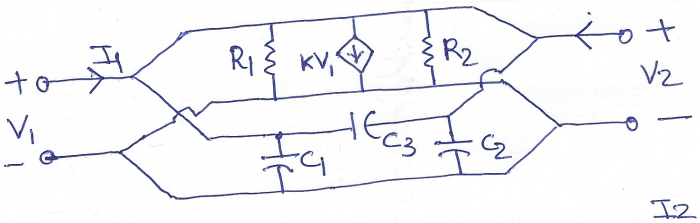


fig. 15a

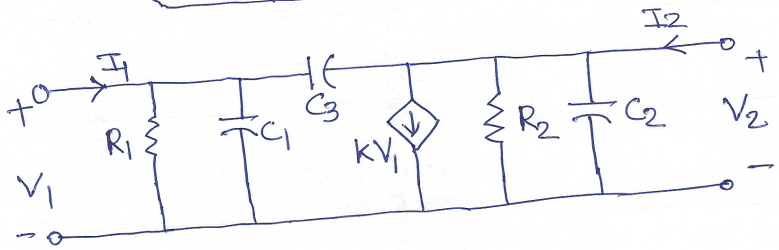


fig 15 b

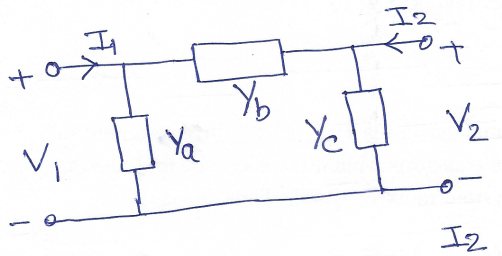


fig. 16a

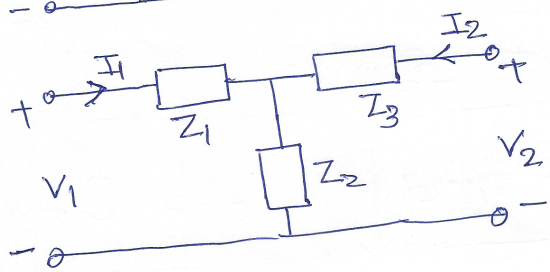


fig 16 b