

EXPERIMENT 10

TWO PORT NETWORKS

OBJECTIVE: Investigate the terminal characteristics of two port networks. Parameters of the series parallel and cascade connection of the networks will be examined.

PRELIMINARY WORK

P1

- In the T equivalent circuit shown in Figure 10.1 calculate the resistances R_1 , R_2 and R_3 in terms of open circuit parameters.
- For $R_1=250\Omega$, $R_2=500$ and $R_3=150\Omega$ find the open circuit parameters of the network. **Verify your results by simulating circuit with PSPICE student edition. Paste your schematics in your preliminary work of report**

P2

- In the π equivalent circuit shown in Figure 10.1 b) calculate the resistances R_1 , R_2 and R_3 in terms of short circuit parameters.
- For $R_A=500\Omega$, $R_B=1000\Omega$ and $R_C=250\Omega$ find the short circuit parameters of the network. **Verify your results by simulating circuit with PSPICE student edition. Paste your schematics in your preliminary work of report**

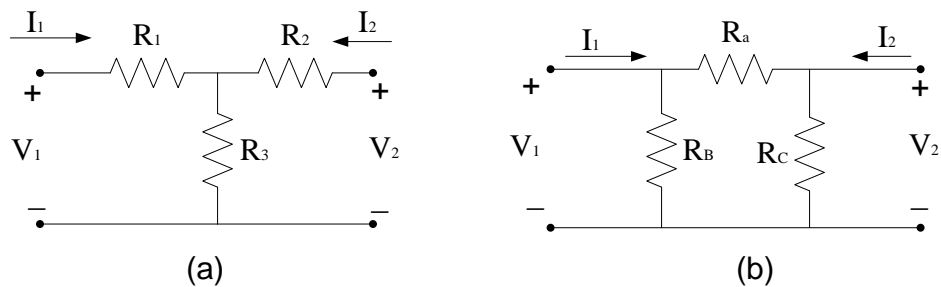


Figure 10.1

P3 Find The ABCD parameters of the networks given in Figure 10.1

P4

- Derive the open circuit parameters of the **series** connection given in Figure 10.2 a)
- Derive the short circuit parameters of the **parallel** connection given in Figure 10.2 b)
- Derive the ABCD parameters of the **cascade** connection given in Figure 10.2 c)

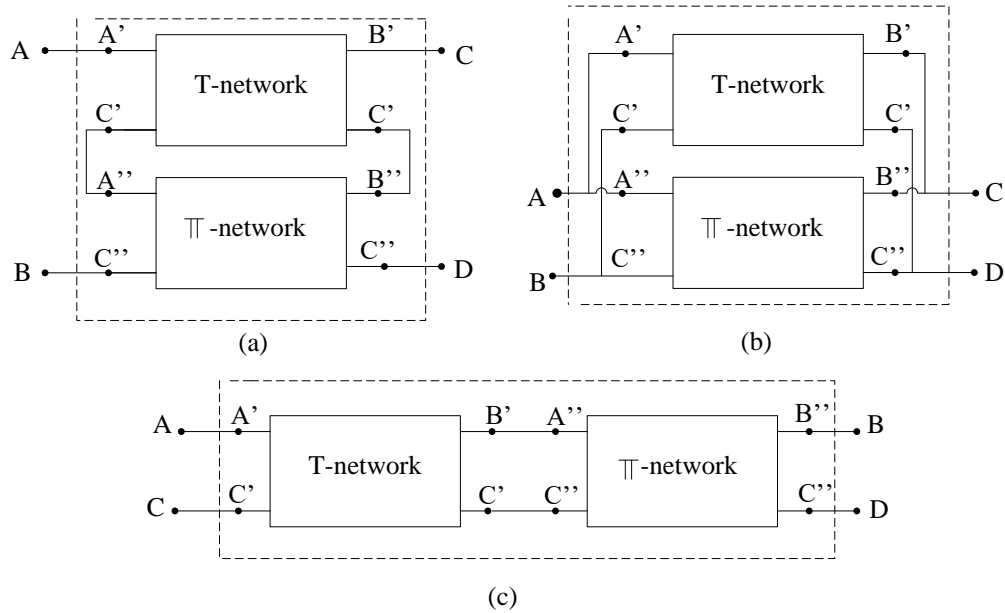


Figure 10.2

EQUIPMENT

- Digital Multimeter (DMM)
- Avometer (AVO8)
- Power Supply
- Resistors

EXPERIMENTAL WORK

E1 By applying proper open and short circuit tests, find the open circuit and short circuit parameters of the networks given in Figure 10.1.

E2 For the same networks given in Figure 10.1, find the ABCD parameters of the circuits

E3

- a) Find open circuit parameters of the series connected network given in Figure 10.2 a)
- b) Find short circuit parameters of the parallel connected network given in Figure 10.2 b)
- c) Find ABCD parameters of the cascaded configuration given in Figure 10.2 c)

CONCLUSION

C1 State reasons of the differences between theoretical results and experimental results

C2 Give the advantages of two-port circuit modeling