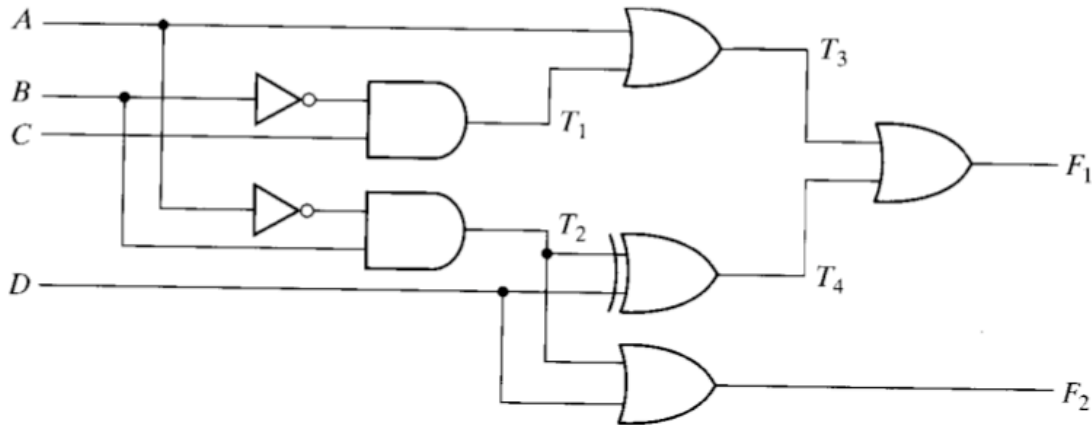




EECE 256 Assignment 3

1. Consider the combinational circuit in the figure below.
 - a. Derive the Boolean expressions for T1 through T4. Derive outputs F1 and F2 as function of the four inputs.
 - b. List the truth table (4 variables). Then list T1 through T4, F1 and F2.
 - c. Use K-maps to simplify these expressions and show that they are equivalent to the ones obtained in (a).



2. Design a combinational circuit that converts a 4-bit gray code to a 4-bit binary number. Implement the circuit using exclusive-OR gates.

3. A BCD-to-seven-segment decoder is a combinational circuit that converts a decimal digit in BCD to an appropriate code for the selection of segments in a display indicator used for displaying the decimal digit in a familiar form. The seven outputs of the decoder (*a, b, c, d, e, f, g*) select the corresponding segments in the display, as shown in Figure 3a. The numeric display chosen to represent the decimal digit is shown Figure 3b. Design this decoder using a minimum number of gates. The six invalid combinations should result in a blank display.

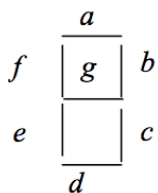


Figure 3 a

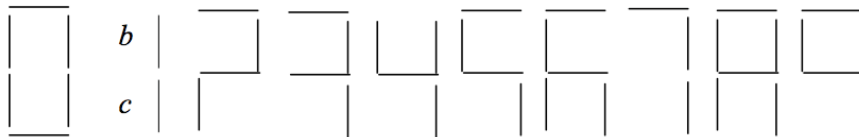


Figure 3 b

4. Question 4.2, 4.3b, 4.4a, 4.6a, 4.8, 4.13, 4.14 from your text book.