

1. Simplify the Boolean function F together with the don't care condition d in sum of products form

$$F(w,x,y,z) = \sum (0,1,2,3,7,8,10)$$

$$d(w,x,y,z) = \sum (5,6,11,5)$$

2. Design a 2 bit count-down counter. This is a sequential circuit with two flip flops and one input x. When x=0, the state of the flip flop does not change. When x=1, the state sequence is 11,10,01,00,11 and repeat.

3. A Rom chip of 4096 x 8 bits has two enable inputs and operates from a 5 volt power supply. How many pins are needed for the integrated circuit package? For power supply we require 2 pins.

4. Fill in the blanks

a) $(54.12)_8 = (\text{_____})_{10}$

b) $(89A.B)_{16} = (\text{_____})_8$

5. What is wrong with following Register Transfer instructions

a) xT : $AR \leftarrow AR, AR \leftarrow 0$

b) yT: $R1 \leftarrow R2, R1 \leftarrow R3$

c) zT : $PC \leftarrow AR, PC \leftarrow PC+1$