

BME – 231

DIGITAL LOGIC DESIGN – EXPERIMENT 10

Counters and Shift Registers

Purpose :

1. Design a 2 minute chronometer.
2. Design a bi-directional shift register with parallel load.
3. Design a hexadecimal 7 segment display driver.
4. Design a sliding text display driver.

Preliminary Work :

1. Design a chronometer which counts up seconds and shows seconds and minutes in 7 segment display (Hint: clock pulses CP are available with square wave generator, you must fix it to 5 V and 1 Hz for 1 second).
It must count from 0:00 to 1:59 in displays! (2 minute chronometer ☺)
2. Design a 4-bit bi-directional shift register with parallel load. You must use D flip flops and your design handles 3 operations:
 - a) Shift right
 - b) Shift left
 - c) Parallel Load(Hint: Your textbook includes a solution for this and clock pulses CP are available with square wave generator, you must fix it to 5 V and 1 Hz)

Experimental Work :

Construct your designs for preliminary work 1,2 in EWB and simulate it.

Bonus Work: ☺

1. Design a hexadecimal 7 segment display driver.(BONUS 30 pts)
2. Design a sliding text display driver with registers etc. It must be constructed similar like in Figure 1 with 4x8 matrix red probes and it must display your name and surname in that text slider matrix similar like my name in Figure 1.
(BONUS 70 pts)

You can construct your bonus circuits only in laboratory time! Never want any extra time nor written expressions for your circuits. Just show that they work and take points for your absent laboratory points. Their points are indicated next them. ☺

Figure 1

