

Homework 3

Due on 13/12/2009

Submit Handwritten Answers Only

Chapter 5:

Problems: 2, 4, 5, 6, 9, 10, 11, 13, and 14

Problems 6, 9, 13, and 14 are shown below

- 5-6. A sequential circuit with two D flip-flops A and B , two inputs X and Y , and one output Z is specified by the following input equations:

$$D_A = XA + X\bar{Y}, \quad D_B = X\bar{B} + \bar{X}A, \quad Z = \bar{X}\bar{B}$$

- (a) Draw the logic diagram of the circuit.
(b) Derive the state table.
(c) Derive the state diagram.
- 5-9. Starting from state 00 in the state diagram of Figure 5-17(a), determine the state transitions and output sequence that will be generated when an input sequence of 01011001101 is applied.
- 5-13. Design a sequential circuit with two D flip-flops A and B and one input X . When $X = 1$, the state of the circuit remains the same. When $X = 0$, the circuit goes through the state transitions from 00 to 10 to 11 to 01, back to 00, and then repeats.
- 5-14. The state diagram for a sequential circuit appears in Figure 5-40.
(a) Find the state table for the circuit.
(b) Make a state assignment for the circuit using 3-bit codes and find the encoded state table.