Exercise Seven

5. 16 Design a sequential circuit with two D flip-flops A and B, and one input x_in.
(a) When x_in = 0, the state of the circuit remains the same. When x_in = 1, the circuit goes through the state transitions from 00 to 01, to 11, to 10, back to 00, and repeats.
(b) When x_in = 0, the state of the circuit remains the same. When x_in =1, the circuit goes through the state transitions from 00 to 11, to 01, to 10, back to 00, and repeats.

5. 18 Design a sequential circuit with two JK flip-flops A and B and two inputs E and F. If E = 0, the circuit remains in the same state regardless of the value of F. When E = 1 and F = 1, the circuit goes through the state transitions from 00 to 01, to 10, to 11, back to 00, and repeats. When E = 1 and F = 0, the circuit goes through the state transitions from 00 to 11, to 10, to 01, back to 00, and repeats.
5. 19 A sequential circuit has three flip-flops A, B, C ; one input x_in ; and one output y_out. The state diagram is shown in Fig. P5.19 . The circuit is to be designed by treating the unused states as don't-care conditions. Analyze the circuit obtained from the design to determine the effect of the unused states.

(a) Use D flip-flops in the design.
(b) Use JK flip-flops in the design.

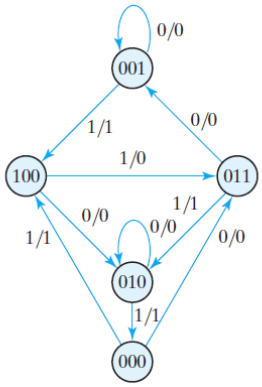

Fig. p.19

5. 20 Design the sequential circuit specified by the state diagram of Fig. 5.19 , using T flip-flops.

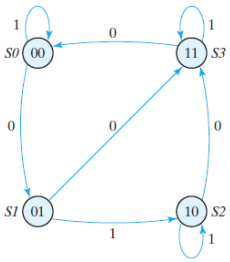

FIGURE 5. 19