(*Affiliated To Tribhuvan University*)

# NIST College
# Department of BScCSIT
# First Semester
# Digital Logic

## Tutorial 6

## Analysis of Clocked Sequential Machine

*Analyze the following clocked sequential circuits:*

1.

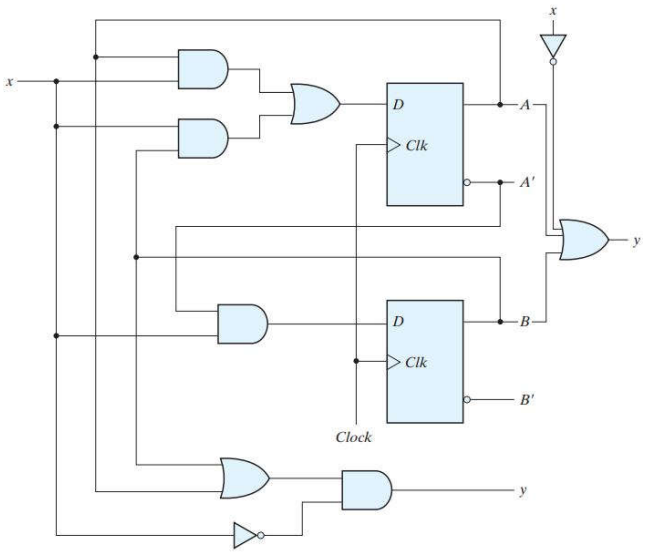


Figure 1

2.

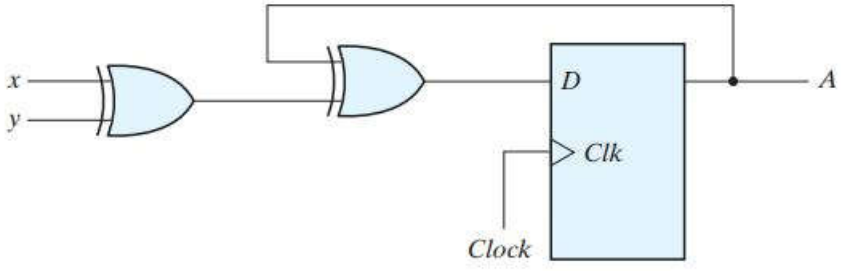


Figure 2

3.

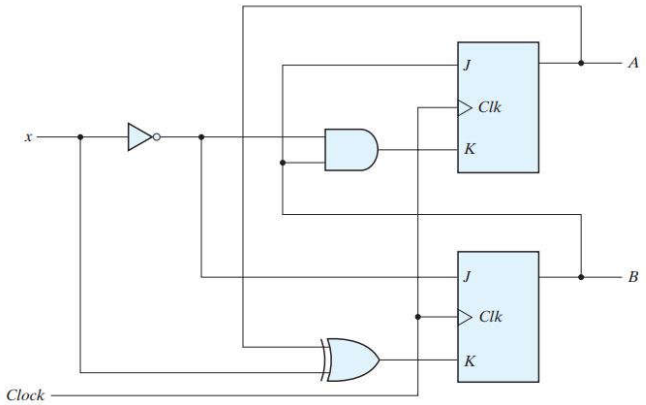


Figure 3

4.

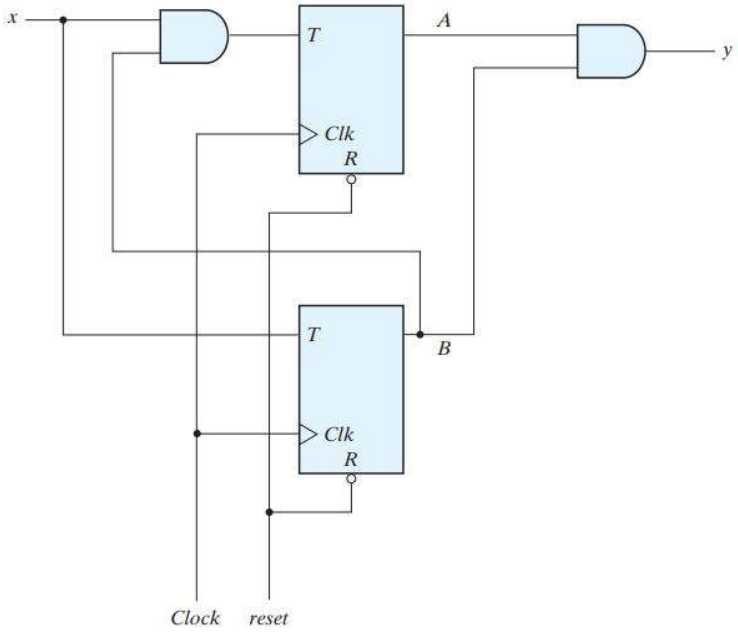


Figure 4

5.

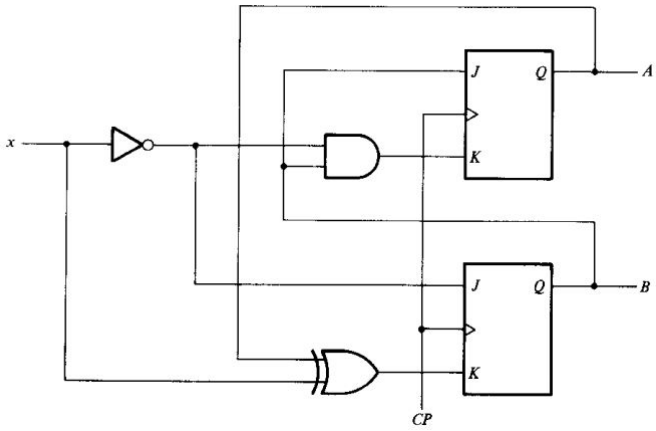


Figure 5

6.

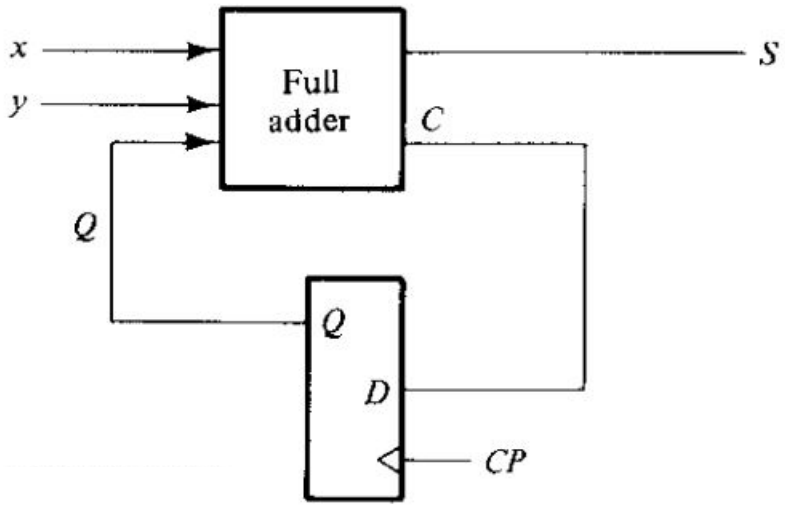


Figure 6

7.

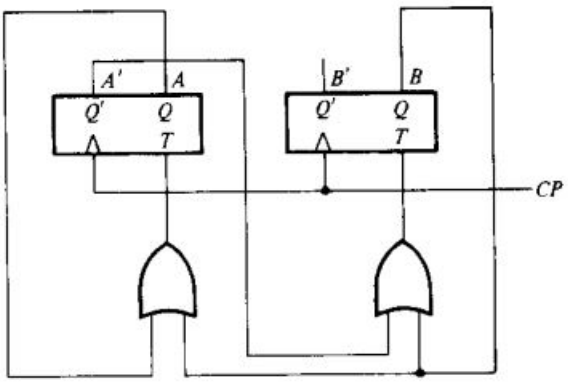


Figure 7

8. 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 next-state and output equations:

   $A(t + 1) = x'y + xA$
   $B(t + 1) = x'B + xA$
   $z = B$

   i. Draw the logic diagram of the circuit.
   ii. Derive the state table.
   iii. Derive the sate diagram

9. A sequential circuit has two JK flip-flops, *A* and *B*; two inputs, *x* and *y*; and one output, *z*. The flip-flop input functions and the circuit has output function are as follows:

   $JA = Bx + B'y'$ $KA = B'xy'$
   $JB = A'x$ $KB = A + xy'$
   $Z = Axy + Bx'y'$

   i. Draw the logic diagram of the circuit.
   ii. Derive the next-state equations for A and B.
   iii. Tabulate the state table.
   iv. Draw state diagram