Homework 5

Due Date:4/22/2019

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Total Marks 30+30+20+20= 100

1. A sequential circuit with two D flipflops A and B , two inputs X and Y , and one output Z is specified by the following input equations:

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

a) Draw the logic diagram

b) Derive the state table

c) Derive the state diagram

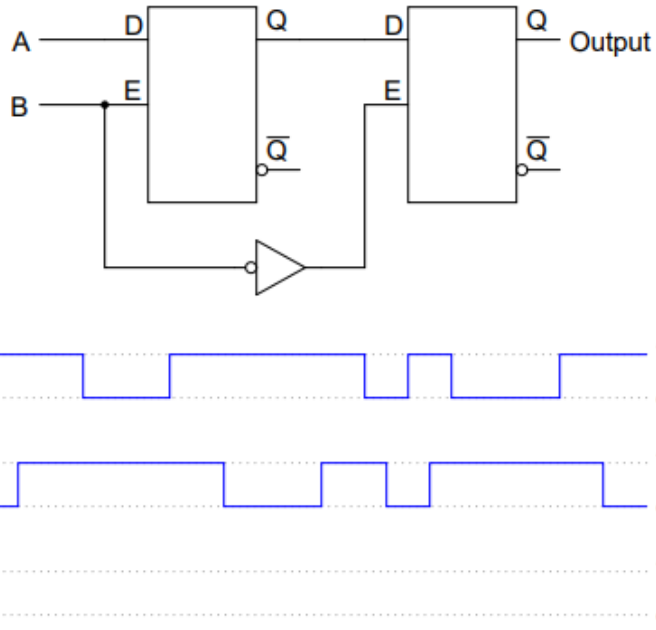
2. The state diagram for a sequential circuit is given below:

a) Find the state table for the circuit, make a state assignment for the circuit using 3 bit codes.

b) Find an optimized circuit implementation using D flip flop and other necessary gates.

c) Draw the logic diagram of the circuit.

3. Determine the final output states over time for the following circuit.



4. Determine the output state for this J-K flip-flop, given the pulse inputs shown: