King Fahd University of Petroleum & Minerals
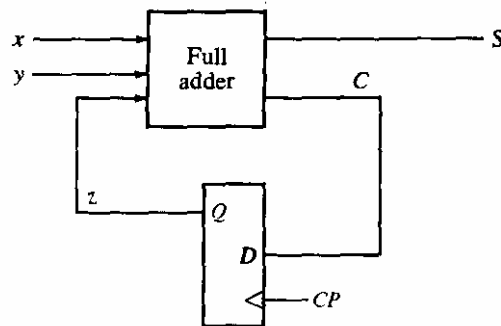
College of Computer Sciences and Engineering
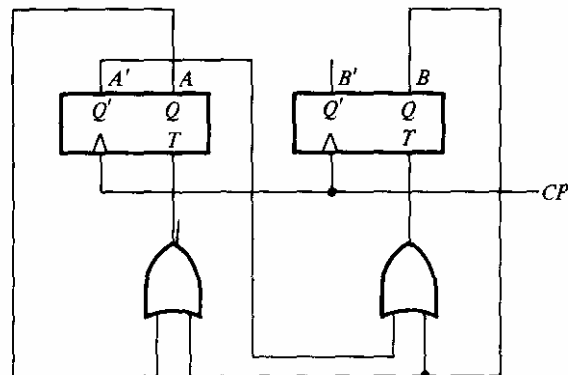
Department of Computer Engineering

COE 202: Fundamentals of Computer Engineering (071)

Assignment 4

1. The full-adder of the following figure receives two external inputs x and y; the third input z comes from the output of a D flip-flop. The carry output is transferred to the flip-flop every clock pulse. The external S output gives the sum of x, y, and z. Obtain the state table and state diagram of the sequential circuit.

2. Derive the state table and state diagram of the sequential circuit of the following figure. What is the function of the circuit?

3. A sequential circuit has two flip-flops (A and B), two inputs (x and y), and an output (z). The flip-flop input functions and the circuit output function are as follows:

$$J_A = xB + y'B'$$ $$K_A = xy'B'$$

$$J_B = xA'$$ $$K_B = xy' + A$$

$$z = xyA + x'y'B$$