Assignment 1

Question 1: Design a BCD-to-decimal decoder.

Question 2: A combinational circuit is defined by the following three Boolean functions. Design the circuit with a decoder and external gates.

F1= x'y'z' + xz

F2= xy'z' + x'y

F3 = x'y'z + xy

Question 3: A combinational circuit is specified by the following three Boolean functions. Implement the circuit with a 3 × 8 decoder constructed with NAND gates (similar to Fig. 5-10) and three external NAND gates. Use a block diagram for the decoder.

F1(A, B, C) = (2, 4, 7)

F2(A, B, C) = Σ(0, 3)

F3(A, B, C) = Σ(0, 2, 3, 4, 7)

Question 4: Implement the Boolean function F(A,B,C,D)= Σ(0, 2, 3, 4, ,8,10,14,15) with an 8 × 1 multiplexer, but with inputs A, B, and C connected to selection inputs S2, s1, and so, respectively.

Question 5: Assume we want to design full adder circuit with x,y,z as inputs and S and C as outputs. Design it using multiplexers with x and z as select lines.