Homework 4

Due Date:3/24/2019

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Total Mark - 100 (10+20+10+20+15+25)

1. Obtain the 1's and 2's complement of the following unsigned binary numbers: 10011100,10011101,10101000,10000000,10100010

2. Perform the following subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend:

(a) 11010 – 10001
(b) 11110 – 1110
(c) 1111110 – 1111110
(d) 101001 – 101

3. Perform the arithmetic operation in binary using signed 2's complement representation for negative numbers.

(a) (+36)+(-24)
(b) (-35)-(-24)

4. The following binary numbers have a sign in the leftmost position and if negative are in 2's complement form. Perform the indicated arithmetic and verify the answers.

(a) 100111+111001
(b) 001011+100110
(c) 110001 – 010010
(d) 101110 – 110111

Indicate whether overflow occurs for each computation.

5. Design a combinational circuit whose input is a 4-bit number and whose output is the 2's complement of the input number.

6. The adder and subtractor circuit of figure 1 has the following values for input select S and data input A and B

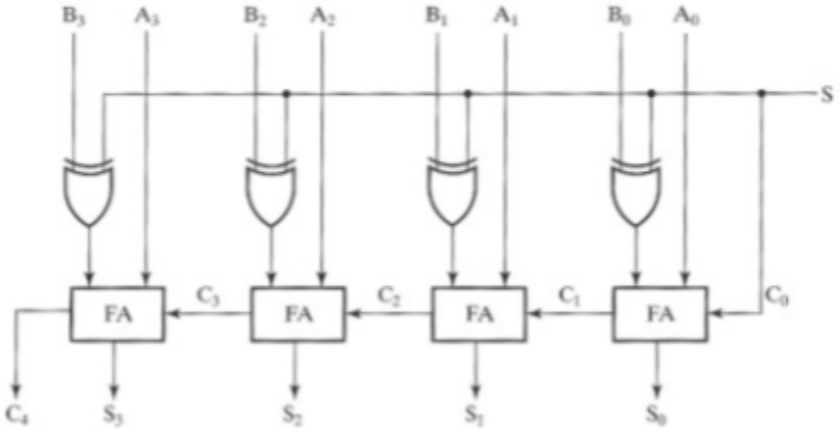

Figure 1: Adder subtractor circuit

S	A	B
a) 0	0111	0111
b) 1	0100	0111
c) 1	1101	1010
d) 0	0111	1010
e) 1	0001	1000

Determine, in each case, the values of the outputs S3, S2. S1, S0 and C4