Tutorial

Computer Arithmetic

1. Multiply -5 and -7 for a 4-bit system architecture using both Iterative and Booths algorithms. Show the intermediate steps.

2. The two numbers given below are multiplied using the Booth's algorithm.

Multiplicand : 0101 1010 1110 1110
Multiplier: 0111 0111 1011 1101

How many additions/Subtractions are required for the multiplication of the above two numbers?

(Show the intermediate steps to find your answer)

3. Booth's algorithm for integer multiplication gives worst performance when the multiplier pattern is
(A) 101010 ……1010
(B) 100000 ……0001
(C) 111111 ……1111
(D) 011111 ……1110

Justify your answer.

4. The number of AND gates and OR gates needed to implement different types of 4-bit adders discussed in the class. Show your intermediate steps.

5. What is the time complexity of Booth's Algorithm? How it is comparable to Iterative multiplication algorithm? Show your intermediate steps to justify your answer.