10-5. Formulate a hardware procedure for detecting an overflow by comparing the sign of the sum with the signs of the augend and addend. The numbers are in signed-2's complement representation.

10-6. **a.** Perform the operation $(-9) + (-6) = -15$ with binary numbers in signed-1's complement representation using only five bits to represent each number (including the sign). Show that the overflow detection procedure of checking the inequality of the last two carries fails in this case.

b. Suggest a modified procedure for detecting an overflow when signed-1's complement numbers are used.

10-7. Derive an algorithm in flowchart form for adding and subtracting two fixed-point binary numbers when negative numbers are in signed-1's complement representation.

10-8. Prove that the multiplication of two n-digit numbers in base r gives a product no more than $2n$ digits in length. Show that this statement implies that no overflow can occur in the multiplication operation.

10-9. Show the contents of registers E, A, Q, and SC (as in Table 10-2) during the process of multiplication of two binary numbers, 11111 (multiplicand) and 10101 (multiplier). The signs are not included.

QUESTIONS FROM STUDY MATERIALS:

Write a program to store input characters in a buffer.
What are the service routine tasks that must be performed by a program interrupt.
Draw the block diagram of the microprogrammed control organization and explain it in brief.
Differentiate between Horizontal versus Vertical Microprogramming.
What is the stack organization of a CPU? Explain with a diagram.
What are the different instruction formats?
Explain zero-address instruction in details with an example.
Explain different types of instructions.
What are the characteristics of RISC?

What are the characteristics of RISC?
What are the characteristics of CISC?