

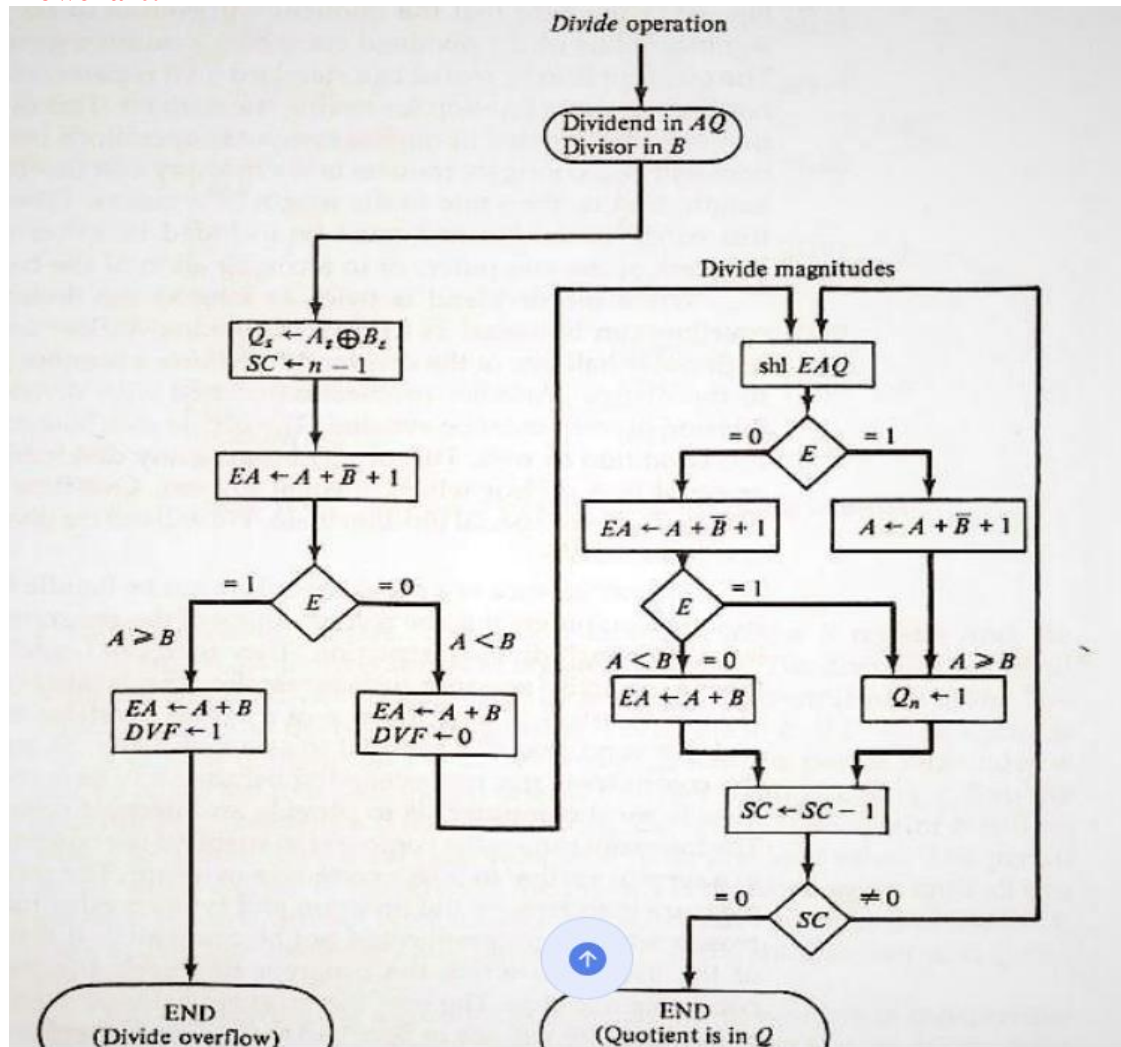
COMPUTER ORGANIZATION AND ARCHITECTURE

UNIT –III

TOPIC- DIVISION OF SIGNED MAGNITUDE DATA PART-2

Signed magnitude Division

Flowchart:



- Initially, the dividend is in A & Q and the divisor is in B and their sign bits in A_s and Q_s and B_s respectively.
- After the division is performed, the quotient is stored in Q and its sign in Q_s and remainder is stored in A.
- The sign of the result is transferred into $Q_s \leftarrow A_s \text{ xor } B_s$, to be part of the quotient.
- SC is set to specify the number of bits in the quotient.

- The condition of divide-overflow is checked by subtracting the divisor in B from the half of the bits of the dividend stored in A.
- If $A \geq B$, DVF is set and the operation is terminated before time.
- If $A < B$, no overflow condition occurs and so the value of the dividend is reinstated by adding B to A.
- The division of the magnitudes starts with the dividend in AQ to left in the high-order bit shifted into E.
- If shifted a bit into E is equal to 1, and we know that $EA > B$.
- In this case, B must be subtracted from EA, and 1 should insert into Q_n , for the quotient bit.
- If the shift-left operation inserts a 0 into E, the divisor is subtracted by adding its 2's complement value and the carry is moved into E.
- If $E = 1$, it means that $A \geq B$; thus, Q_n , is set to 1.
- If $E = 0$, it means that $A < B$, and the original number is reimposed by adding B into A.
- Now, this process is repeated with register A containing the partial remainder.