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West Bengal State Council of Technical Education

.... EXAMINATION

Subject...

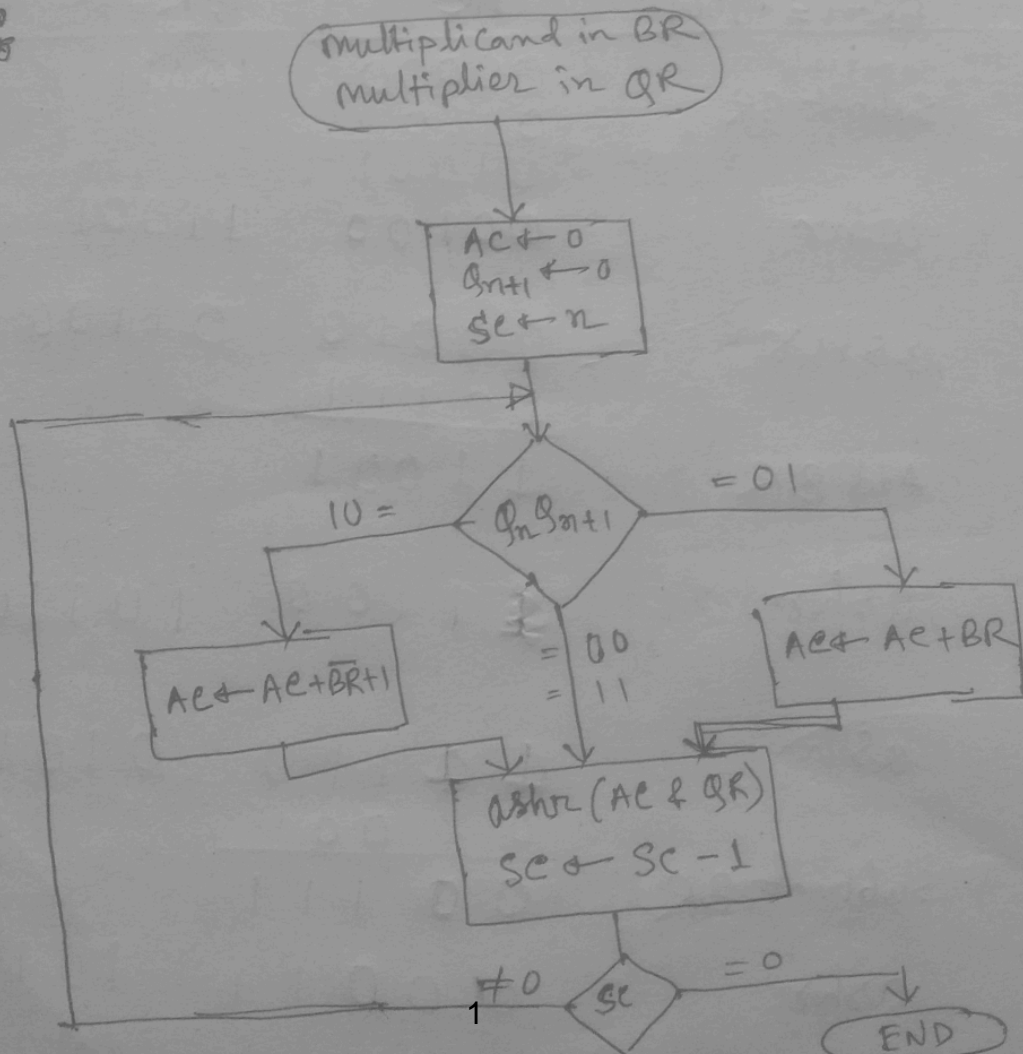Roll .... No. ....

Booth Multiplication Algorithm.

Booth algorithm gives a procedure for multiplying binary integers in signed. 2's complement representation.

<u>Flowchart :</u>

② Example of Booth multiplication :– A numerical example of Booth multiplication algorithm is shown in below for n = 5. It shows the step-by-step multiplication of $(-9) \times (-13) = +117$. The multiplier in QR is negative and the multiplicand in BR is also negative. The 10 bits product appears in AC and QR and is positive.

Multiplier (QR) $= -13 = 10011$
(2's Complet)

multiplicand (BR) $= -9 = 10111$
(2's Complet)

$+13 = 01101$ ⟶ 2's Complet
10011 ⟵

$+9 = 01001$ ⟶ 2's Comp
10111 ⟵

Q_n Q_{n+1}	BR = 10111 $\overline{BR}+1 = 01001$	AC	QR	Q_{n+1}	SC
1 0	initial Subtract BR	00000 01001 01001	10011	0	101
	ashr	00100	11001	1	100
1 1	ashr	00010 10111 11001	01100	1	011
0 1	Add BR				
	ashr	11100	10110	0	010
0 0	ashr	11110 01001 00111	01011	0	001
1 0	Subtract BR				
	ashr	00011	10101	1	000

The result in 00011 10101 = +117