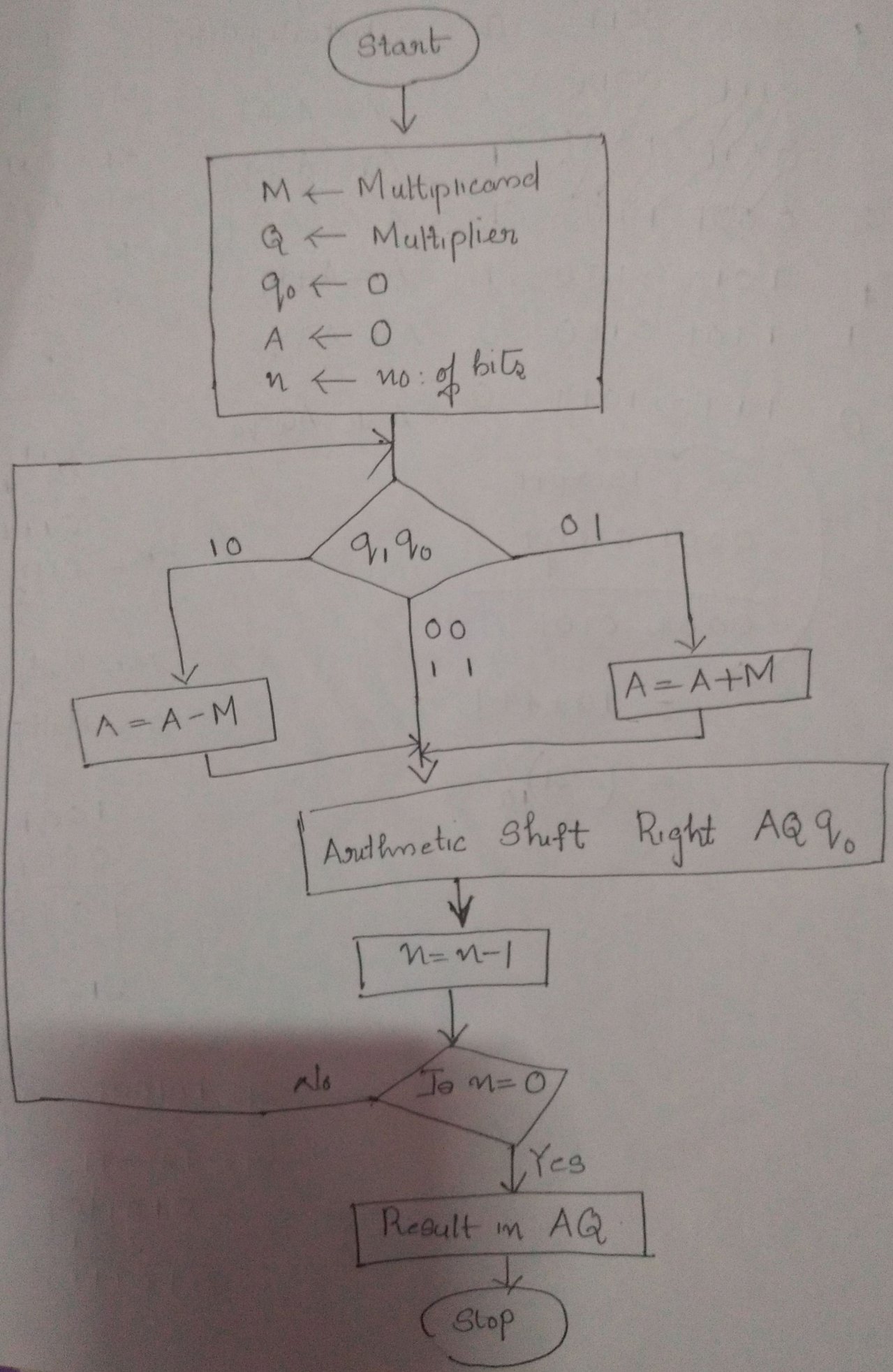
Signed Multiplication : Booth's Algorithm



Example : $(-7) \times (+3) = (-21)$

n	A	Q ($q_4 q_3 q_2 q_1$)	q_0	Action/comment
		0011	0	Intialization
4	0000			
		0011	0	A = A − M
	0111			
		1001	1	ASR AQq_0
3	0011			
		1100	1	ASR AQq_0
2	0001			
	1010	1100	1	A = A + M
	1101	0110	0	ASR AQq_0
1				
	1110	1011	0	ASR AQq_0
0				

1's comp + 1

0001 0100 +
1
0001 0101

$= 16 + 4 + 1$

$= (-21)_{10}$

+7 = 0111

−7 = 1000 +
1
1001
(2's complement)

M = -7_{10}

+7 = 0111

−7 = 1001

M = −7

−M = 2's complement of −7

= 2's com of 1001

= 0110 +
1
0111

−M = 0111
2

M = Multiplicand (−7)

Q = Multiplier (+3)

1001
0001
1010

21 =

2	21
2	10 | 0
2	5 | 0
2	2 | 1
	1 | 0

21 = 10101

−21 = 1's comp + 1

= 01011 +
1
01011