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Q1

Q2 (a)

(a) 4

(b) 0000 - FFFF

(c) 65536

Q2 for 5 bit

1's compliment ⇒ number → 32

5 bits required for number

0 bit unused

max 31 min 0

2's compliment ⇒ number → 31

4 bit required for nimber 16 bit enough

1 bit unused

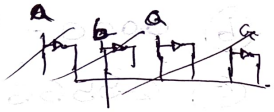
max 15 min -15

Q (2)

Q 2 (c)

$f(a,b,c,d) \Sigma(0,3,5,7,10,11,12,13,14,15)$

ab \ cd	00	01	11	10
00	1	0	1	0
01	0	1	1	0
11	1	1	1	1
10	0	0	1	1



Here →

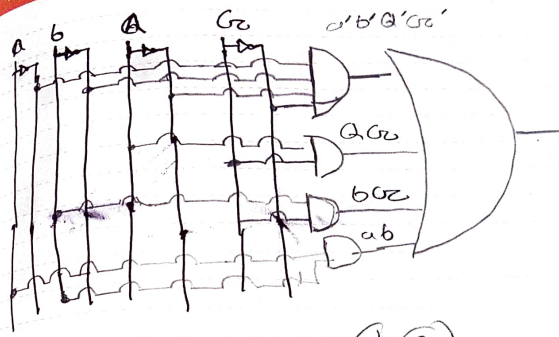
Simplified circuit = $a'b'c'd' + cd + bd + ab$

Q 2 (d)

i) binary → 1001

Gray code → 1101

BCD code of 9 → 1001



Q (2) (c)

Simplified circuit

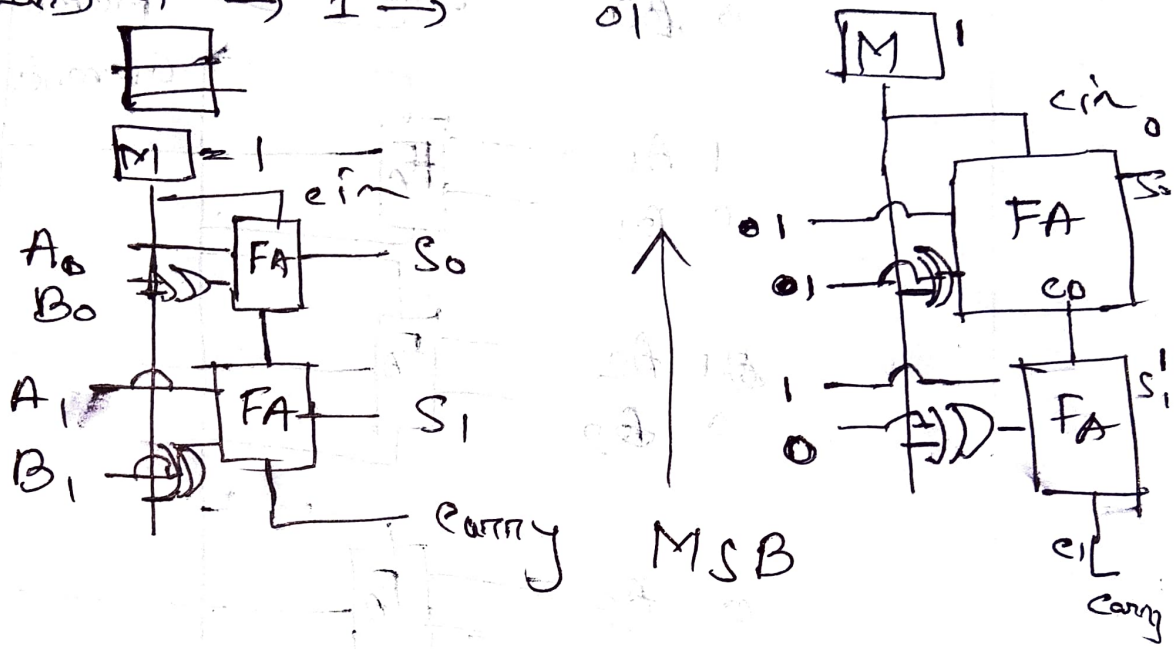
Q(1)

Q(1) 3 - 1

we need 2 bit adder subtractor to ~~create~~ Perform this operation

Binary of → 3 → 11

binary of → 1 → 01



So the answer would be

carry	S1	S0
0	1	0

M → 1 for subtracting

~~A~~ 8 Adder subtractor ~~an~~ XOR gate and carry in to make 2's complement

3 → 11

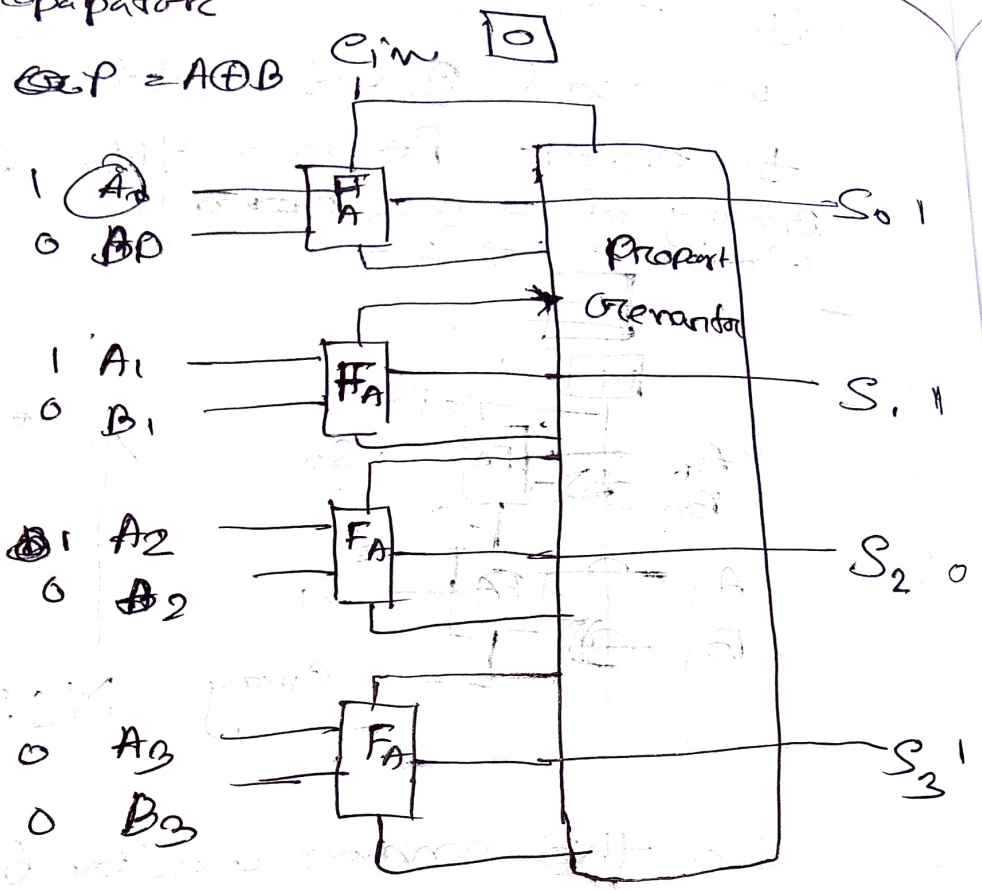
2's complement 1 → 11

10

(Ans)

Q (1)

(2) (b) Propagator



Generator

$G_2 = A \cdot B$

~~7 → 0111~~
~~4 → 0~~

for 7 + 4

binary A = 7 → 0111

B → 4 → 0100

0111
0100
1011

~~P = A0 1 1 1 ⊕ 0 1 0 0~~

$P = P_0 \cdot P_1 \cdot P_2 \cdot P_3$

= 0

$G = G_3 + G_2 P_3 + G_1 P_3 P_2 + G_0 P_3 P_2 P_1$

Q.3 (c)

Sum

com

Q1

Q.1 (a) Half adder

Sum $S = A \oplus B$

carry $C = A \cdot B$