

Q1

- (a) ripple carry is ^{a method of binary addition} in which the carry output of each full adder is connected to carry in of other full adder.
- (b) No, half adder can only be used to add single bit binary numbers or two binary digits alone.
- (c) There is an ambiguity, when all outputs of encoder ^{are} zero. If more than one input is active high, then encoder produces an output which may not be correct code.
- (d) It is a error checking method involving a parity bit which is attached to each group of information bits to make the total number of 1s odd or even for every group of bits.

5

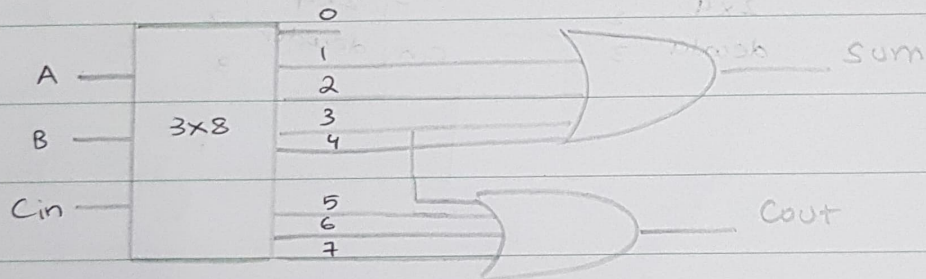
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2 (a)

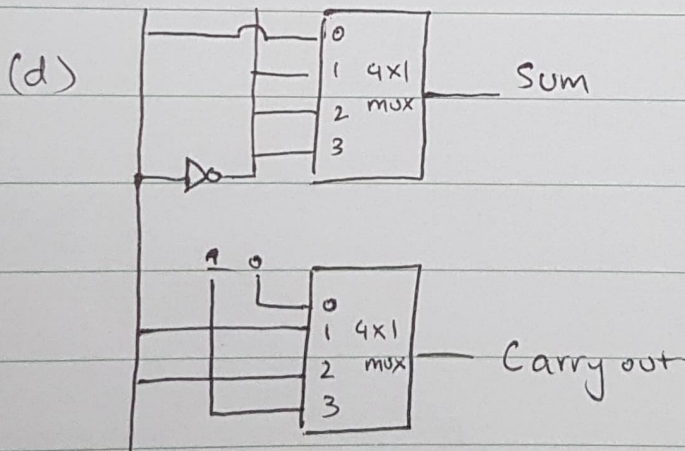
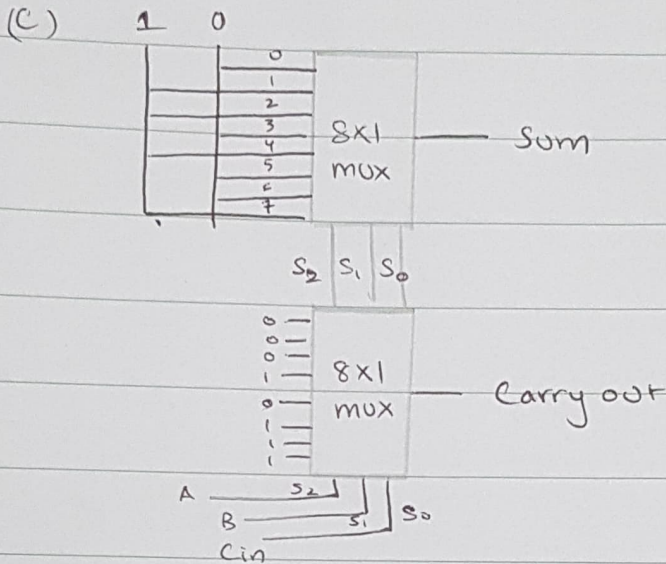
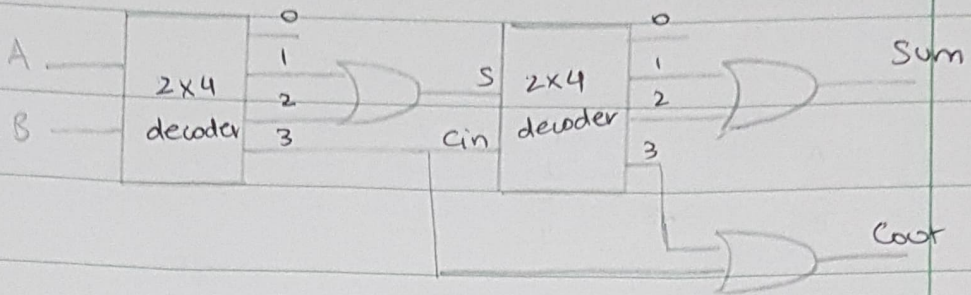
3x8 decoder

$$F_s = \sum (m_1, m_2, m_4, m_3)$$

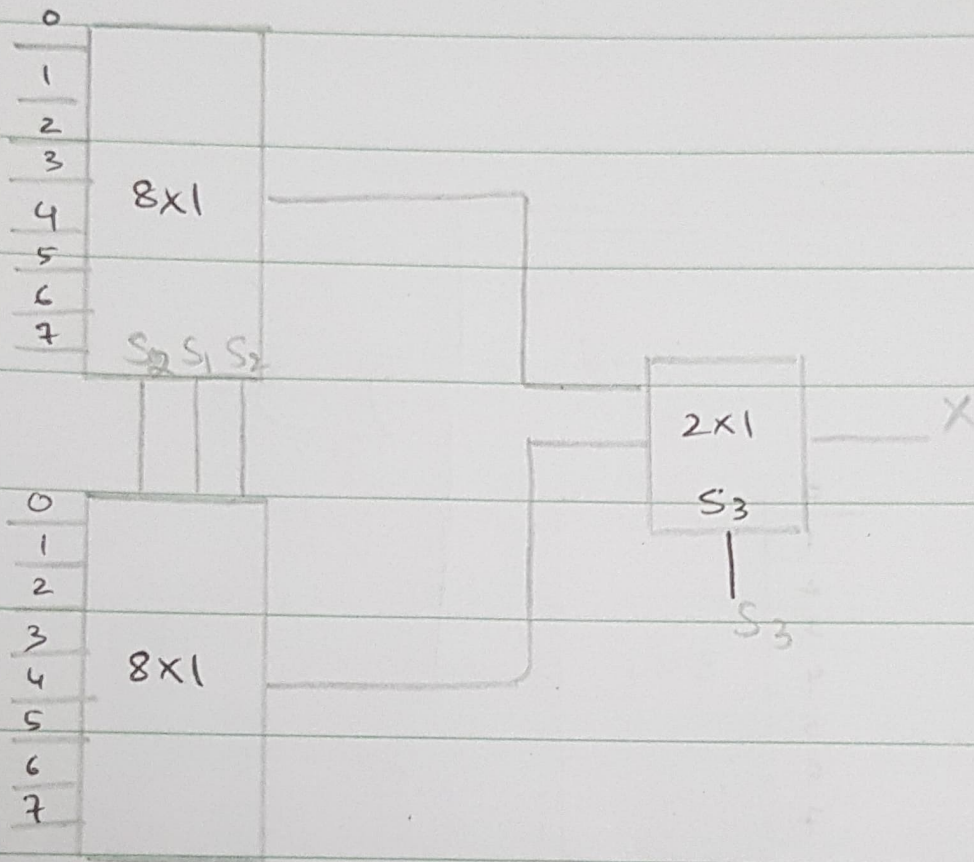
$$F_{\text{cout}} = \sum (m_3, m_5, m_6, m_7)$$



2 (b) TWO 2-4 adders.



3 (a)



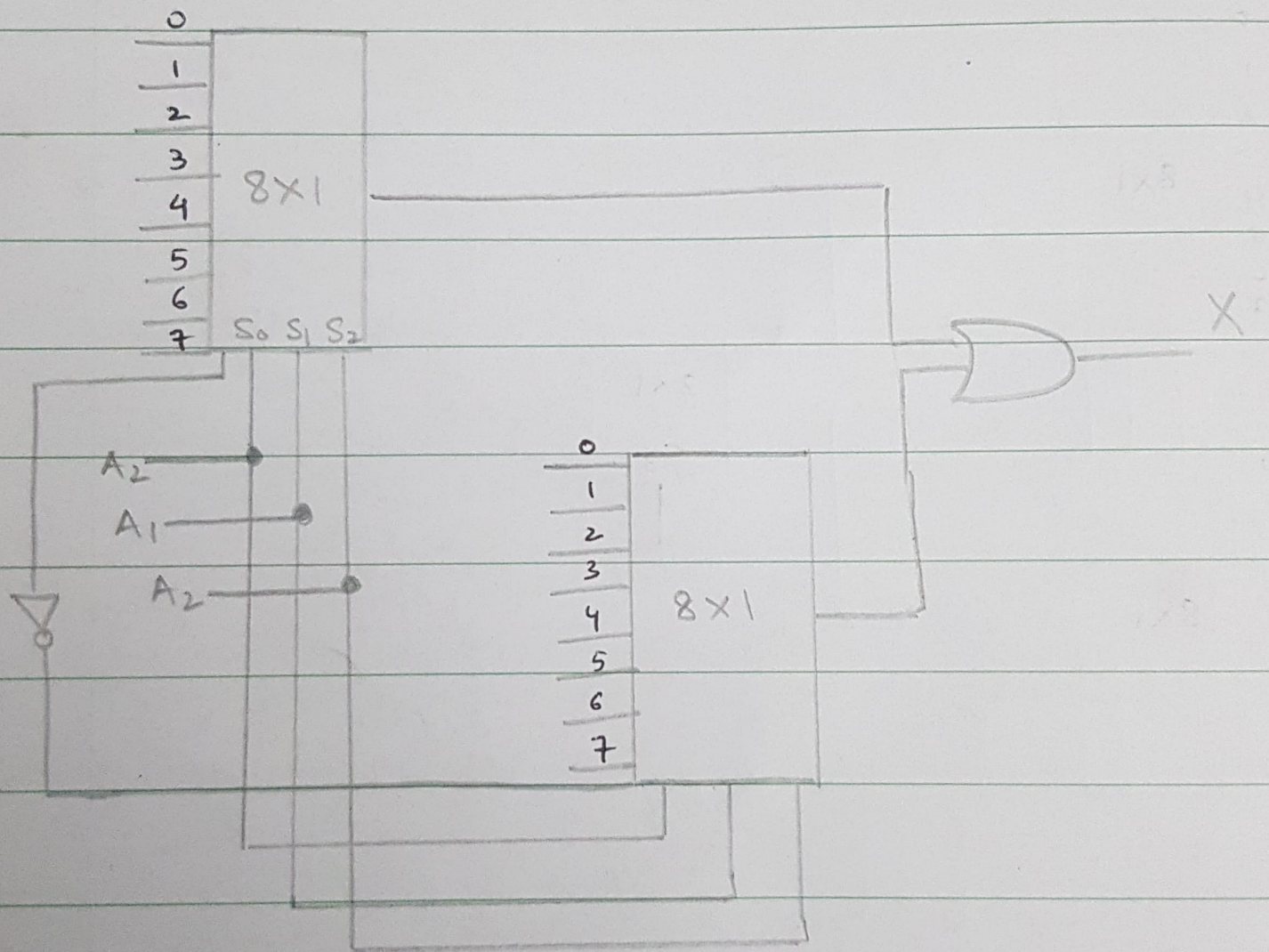
3

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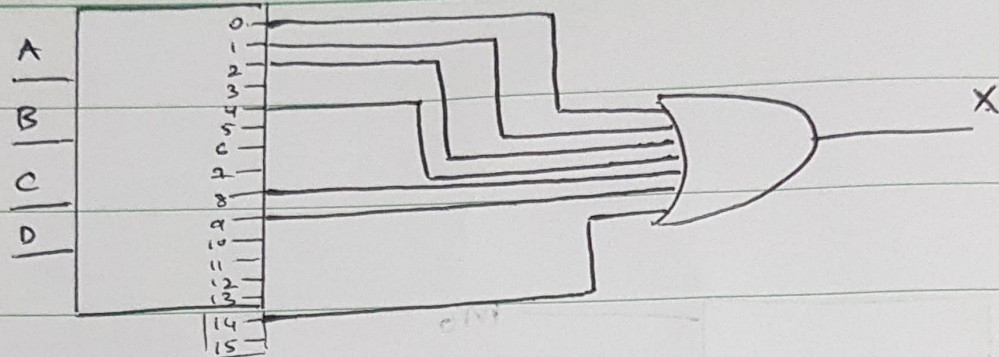
3

(6)

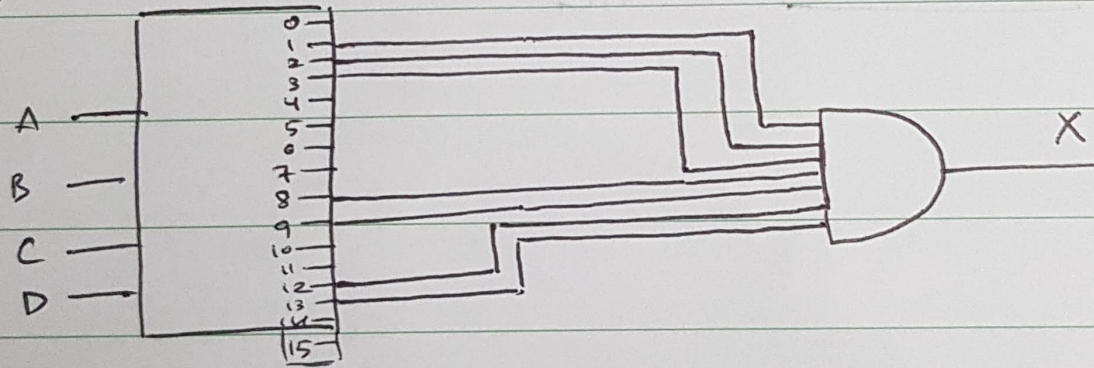
X



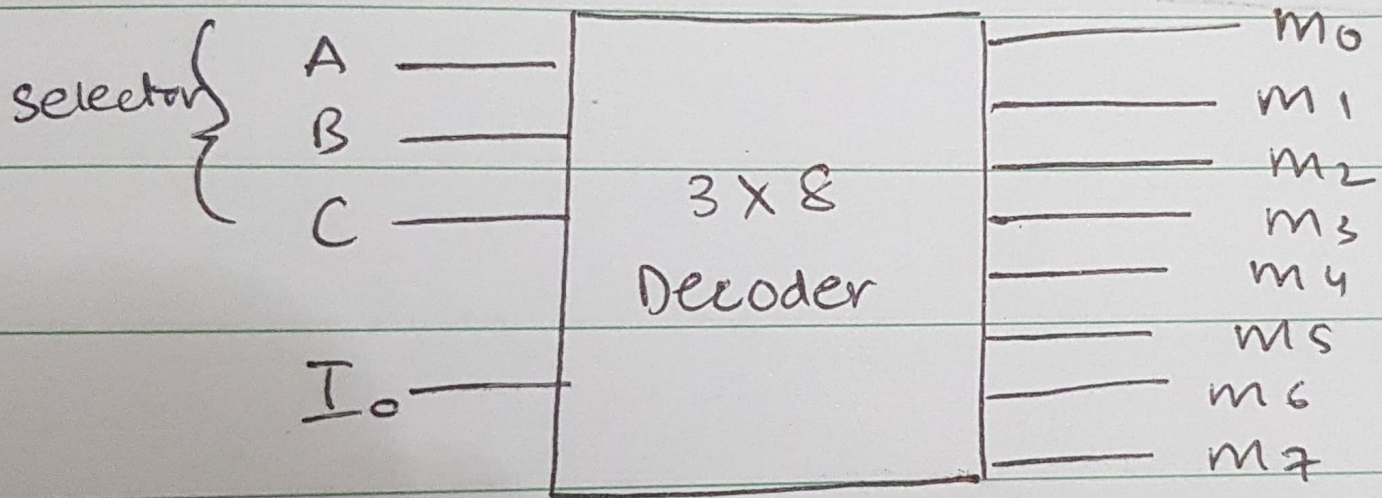
Q4.
(a)



(b)



Q 5.

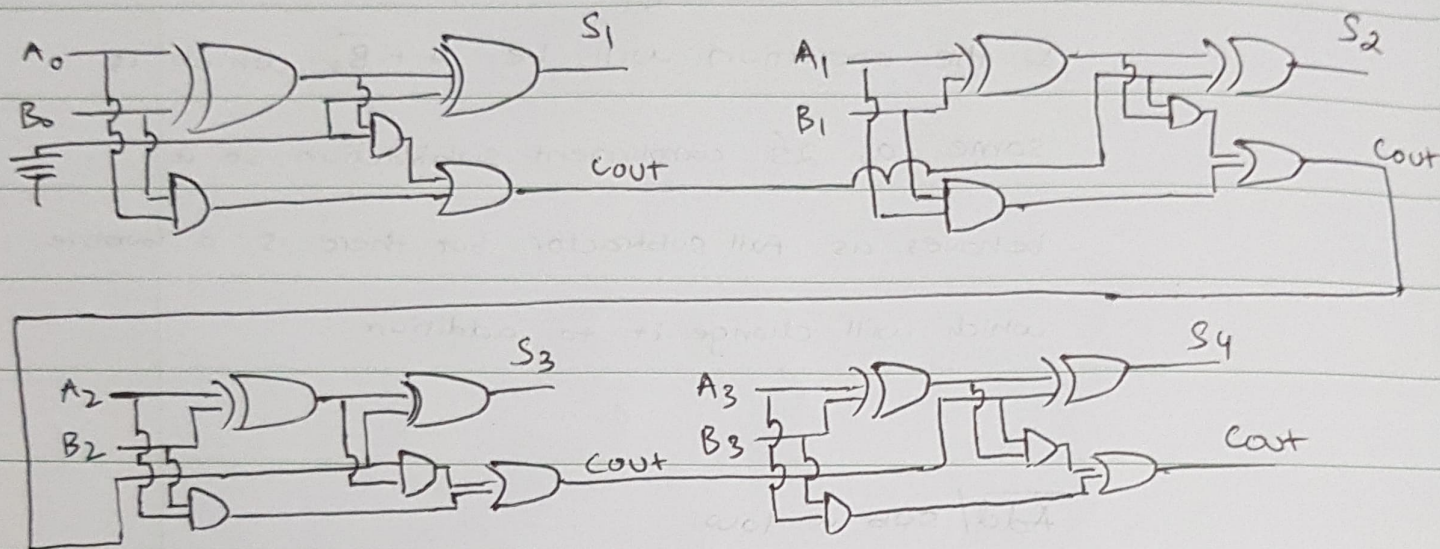


9

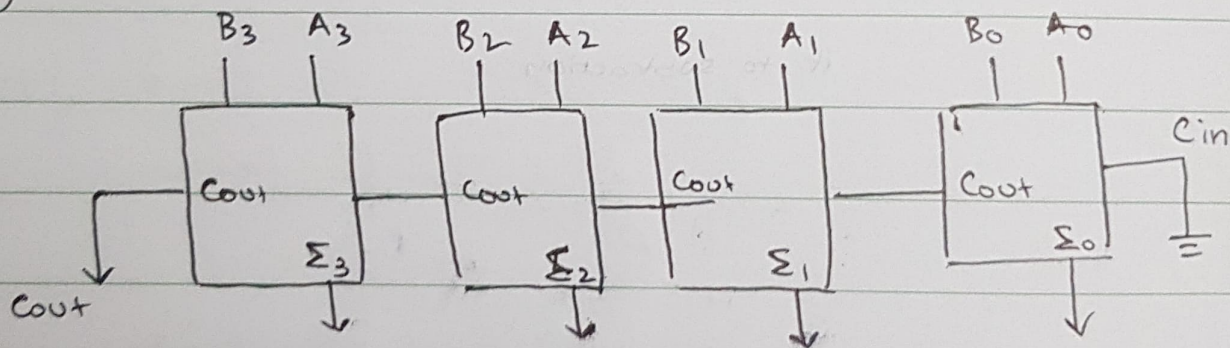
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Q6.

(a)



(b)



Q7).

$\overline{\text{Add}} / \text{sub}$ is high.

If $\overline{\text{Add}} / \text{sub}$ is high, the B_0 will become $\overline{B_0}$

& the operation will be $A + \overline{B_0}$ which is

same as 2's complement subtraction so it

behaves as full subtractor but there is a bubble

which will change it to addition.

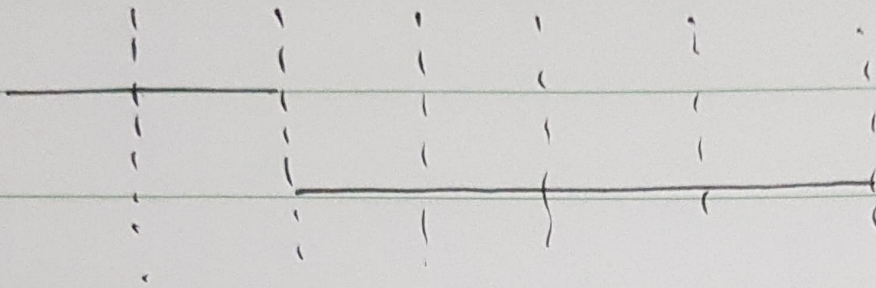
$\overline{\text{Add}} / \text{sub}$ is low

then B_0 will remain same, simple $A + B$

but there is a bubble which will change

it to subtraction

Q 8



Q 9. (a) Output will be 1 when any of the two input combination through nand gate will be 1.
Output = 0 when all 2 input combination going through nand gate will be zero.

(b) Output will be 1 when all inputs are 1
Outputs will be 0 when any of the input is 0.

(c) Output will be 1 when $E = 1$ and either A or B equal to 0 or 0 is equal to 0.
Output will be 0 when $E = 0$.