

Assignment 2

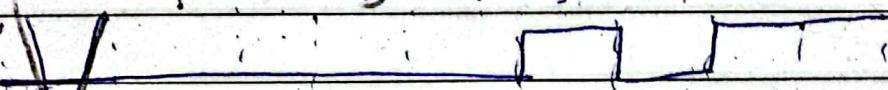
Date:

Question 1

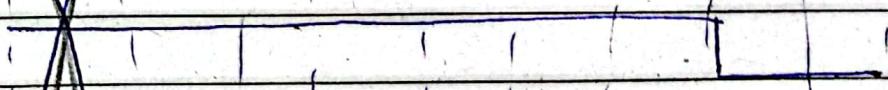
$A_1$	$B_1$	Cin	$\sum_1$	$C_{out}$	$A_2$	$B_2$	$\sum_2$	Cout
1	1	0	0	0	1	0	0	1
1	1	0	0	1	1	1	1	1
0	0	0	0	0	1	0	1	0
0	0	0	0	0	0	1	1	0
0	0	1	1	0	1	0	1	0
1	0	1	0	1	1	1	1	1
1	1	1	1	1	1	0	0	1
1	1	1	1	1	0	1	0	1

1 2 3 4 5 6 7 8

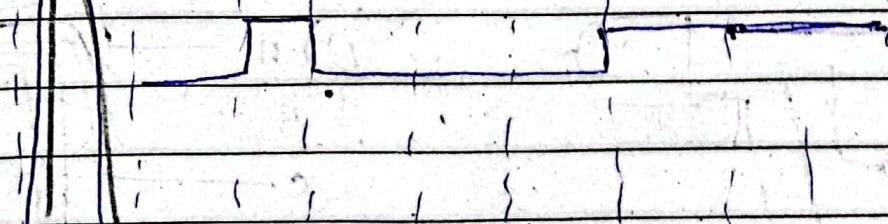
Sum 1:



Sum 2:



Cout:



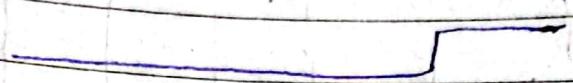
Date:

### QUESTION 2

$A > B$



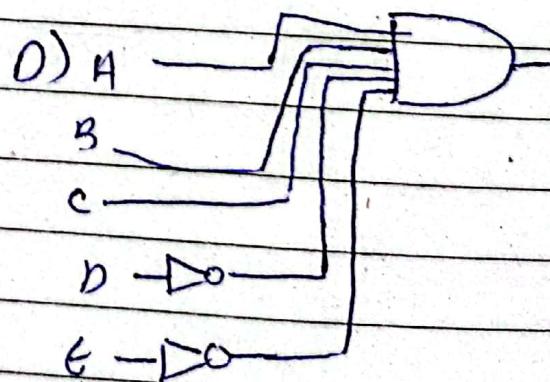
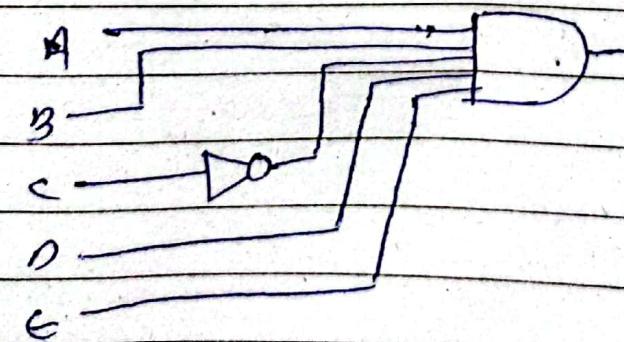
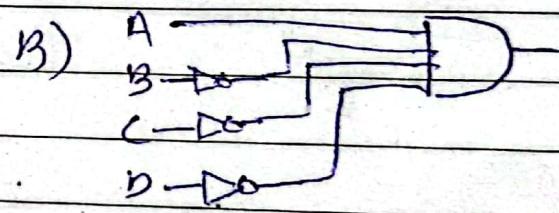
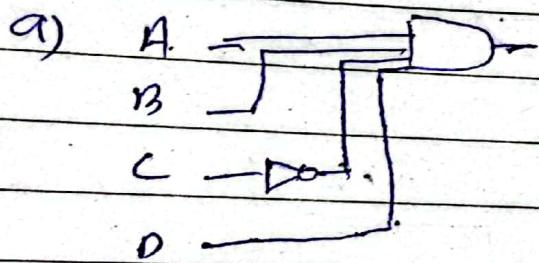
$A < B$



$A = B$



### QUESTION 3

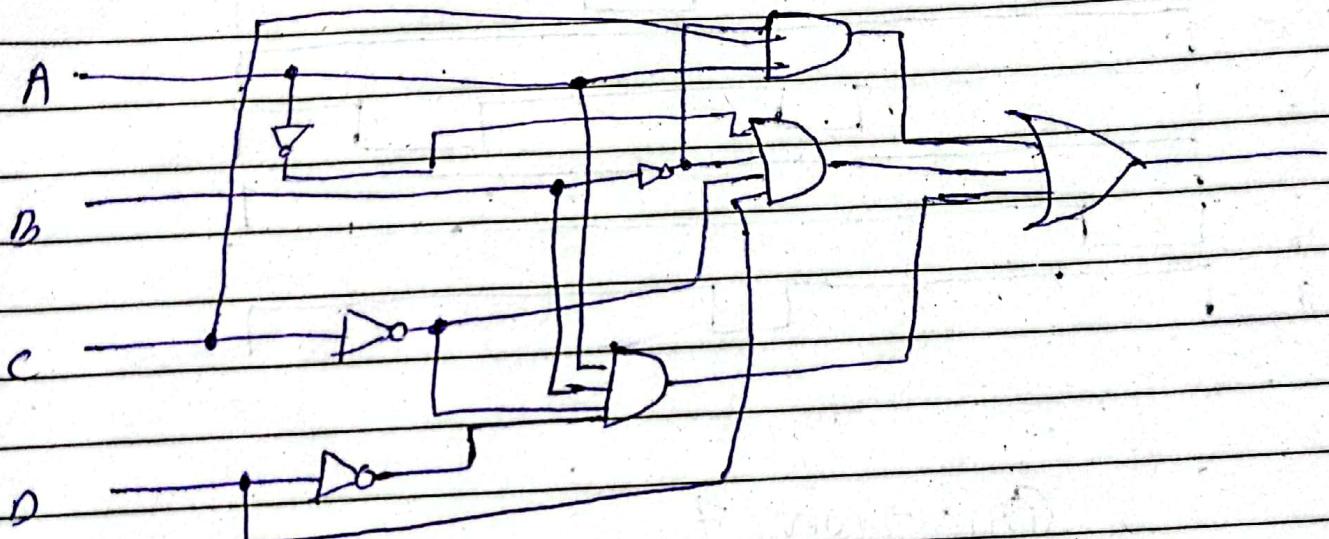


Date: \_\_\_\_\_

### QUESTION 4

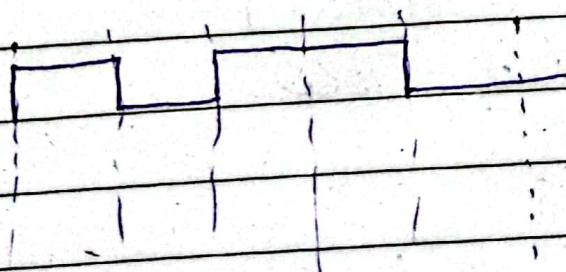
AB	CD	00	01	10	11
00		1			
01					
11		1			
10			1	1	

$$\bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} + A\bar{B}C$$



### QUESTION 5

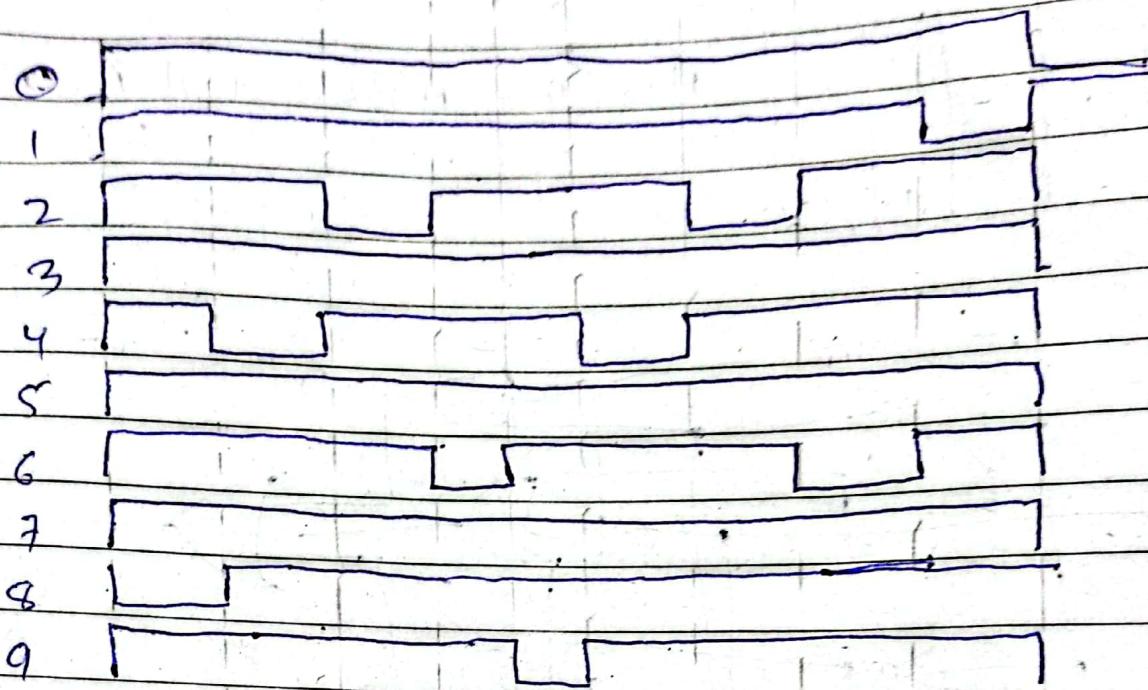
Output



Date:

### QUESTION 6

(Active low)



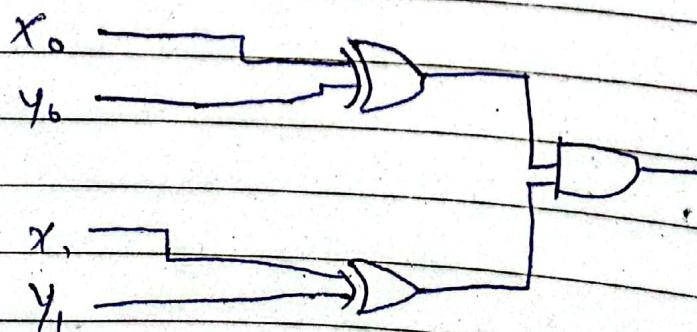
### QUESTION 7

$A_3 A_2 A_1 A_0$

1 0 1 1 . (11 in decimal)

It is not a valid BCD.

### QUESTION 8



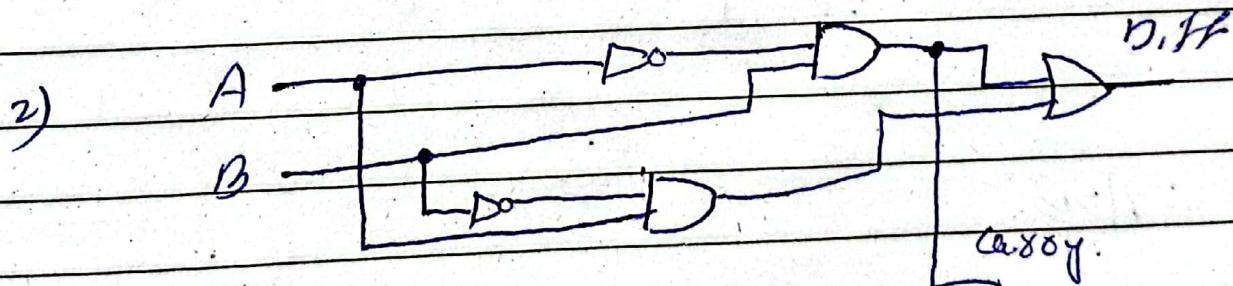
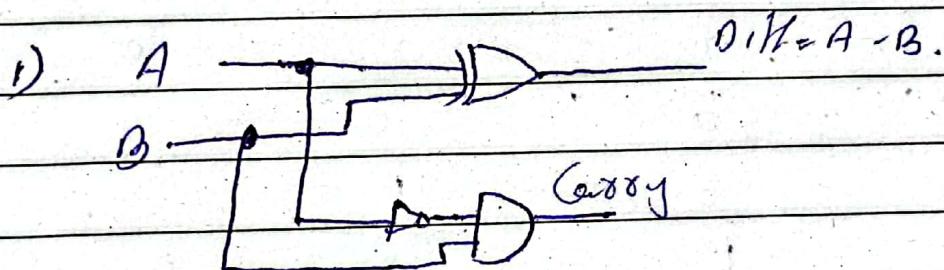
Date:

### Question 9.

A	B	Diff	Carry
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

$$\text{Diff} = A \oplus B = \bar{A}B + A\bar{B}$$

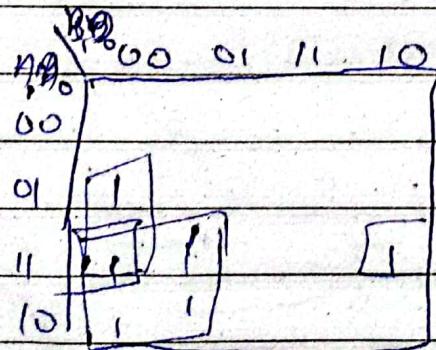
$$\text{Carry} = \bar{A}B$$



Date:

## QUESTION 10.

$A_1$	$A_0$	$B_2$	$B_1$	$B_0$	$A > B$	$A < B$	$A = B$
0	0	0	0	0	0	0	1
0	0	0	1	0	0	1	0
0	0	1	0	0	0	1	0
0	0	1	1	0	0	1	0
0	1	0	0	0	0	1	0
0	1	0	1	1	0	0	1
0	1	1	0	0	0	1	0
0	1	1	1	0	0	1	0
1	0	0	0	1	0	0	0
1	0	0	1	1	0	0	0
1	0	1	0	0	0	1	1
1	0	1	1	0	0	1	0
1	1	0	0	1	0	0	0
1	1	0	1	1	0	0	0
1	1	1	0	1	0	0	0
1	1	1	1	0	0	0	1

Ans  $A > B$ 

$$A_1 B_1 + A_0 B_0 B_1 + A_1 A_0 B_0$$

Date:

For  $A \oplus B$

$A_1 A_0$	$B_1 B_0$	00	01	11	10
00		1	1	1	1
01			1	1	
11					
10			1		

$$\bar{A}_1 B_1 + \bar{A}_1 \bar{A}_0 B_0 + \bar{A}_0 B_1 B_0$$

For  $A = B$

$A_1 A_0$	$B_1 B_0$	00	01	11	10
00		1			
01			1		
11				1	
10					1

$$\bar{A}_1 \bar{A}_0 \bar{B}_1 \bar{B}_0 + \bar{A}_1 A_0 \bar{B}_1 B_0 + A_1 A_0 B_1 B_0 + A_1 \bar{A}_0 B_1 \bar{B}_0$$

$$\Rightarrow \bar{A}_1 \bar{B}_1 (\bar{A}_0 \bar{\oplus} B_0) + A_1 B_1 (\bar{A}_0 \bar{\oplus} B_0)$$

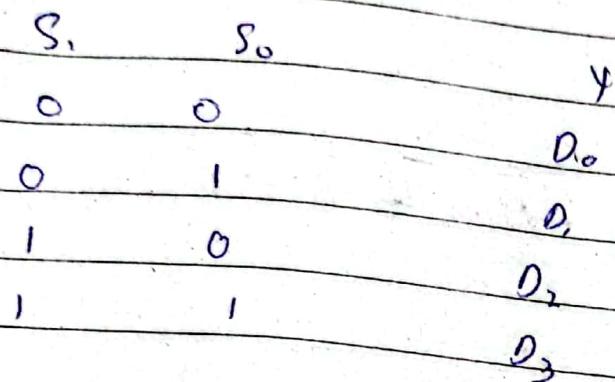
$$\Rightarrow \bar{A}_1 \bar{B}_1 (\bar{A}_0 \bar{\oplus} B_0) + A_1 B_1 (\bar{A}_0 \bar{\oplus} B_0) \quad \text{✓}$$

$$\Rightarrow (\bar{A}_1 \bar{B}_1 + A_1 B_1) (\bar{A}_0 \bar{\oplus} B_0)$$

$$\Rightarrow (\bar{A}_1 \bar{\oplus} B_1) (\bar{A}_0 \bar{\oplus} B_0)$$

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### QUESTION 11



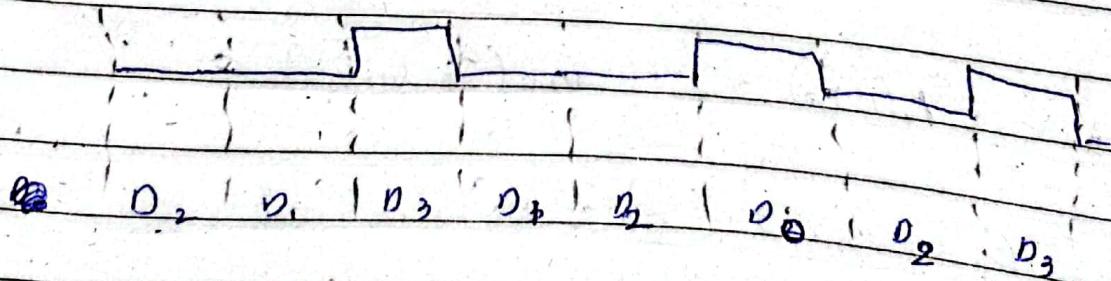
a)  $S_0 = 0, S_1 = 1 \quad Y = D_2 = 0$

b)  $S_0 = 1, S_1 = 1 \quad Y = D_3 = 1$

c)  $S_0 = 1, S_1 = 0 \quad Y = D_1 = 0$

### QUESTION 12

Y.



From problem 11

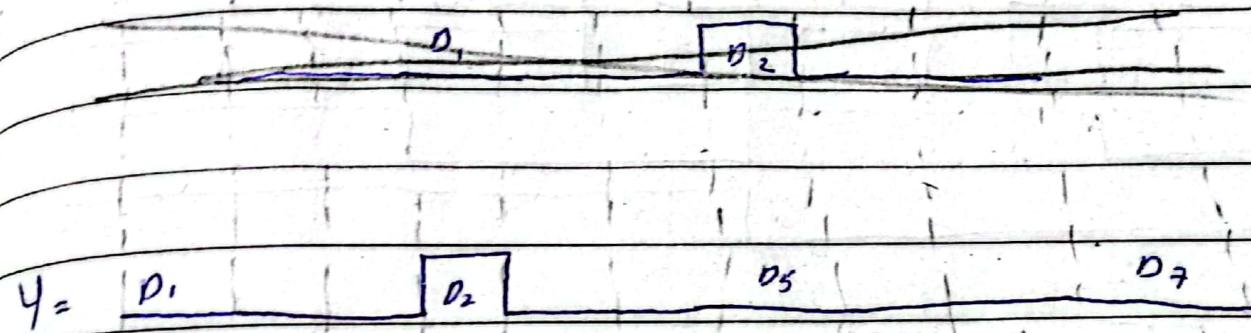
$D_3, D_2, D_1, D_0$

1 0 0 1

Date: \_\_\_\_\_

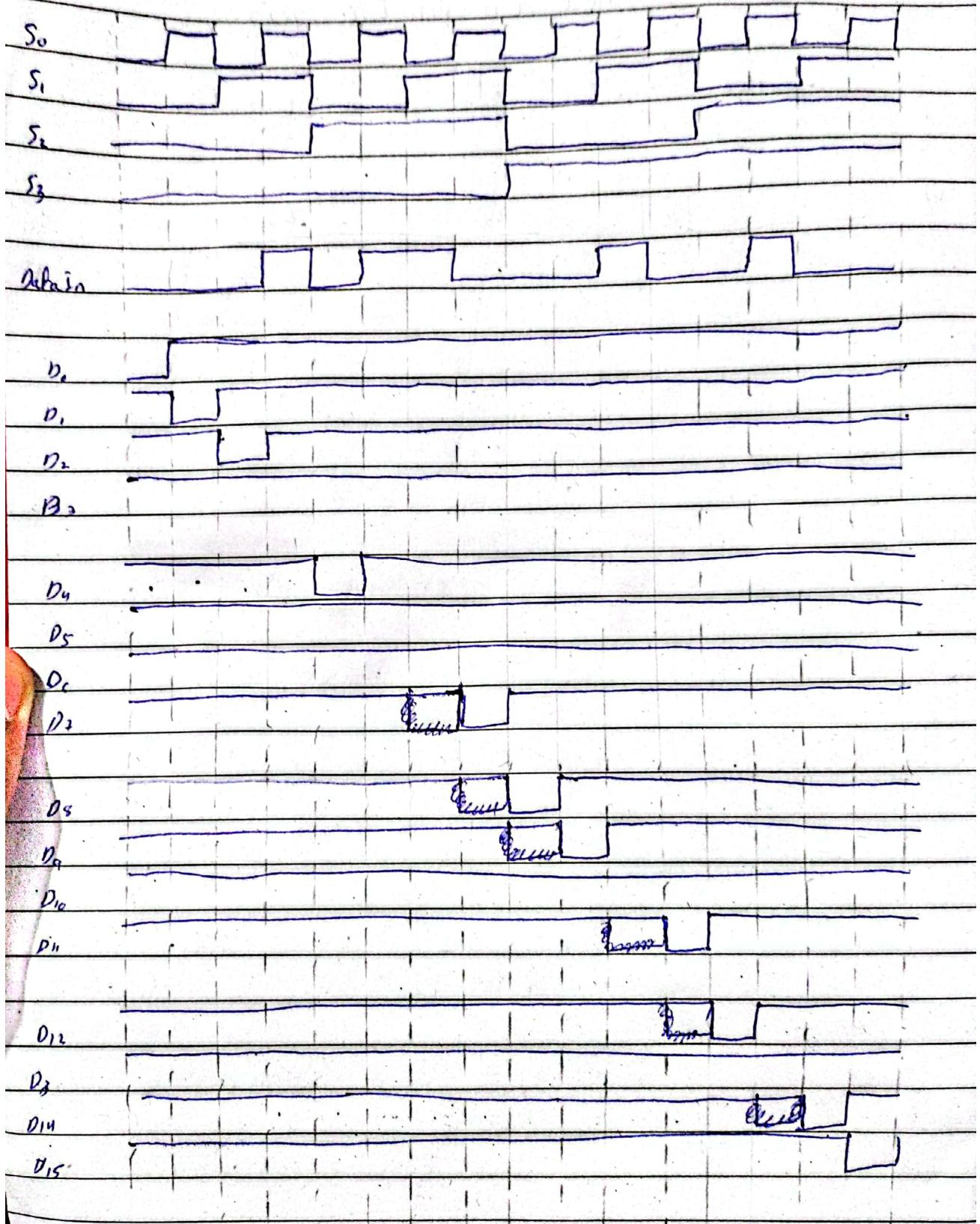
Question 13 =

.. There is a not on enable pin.

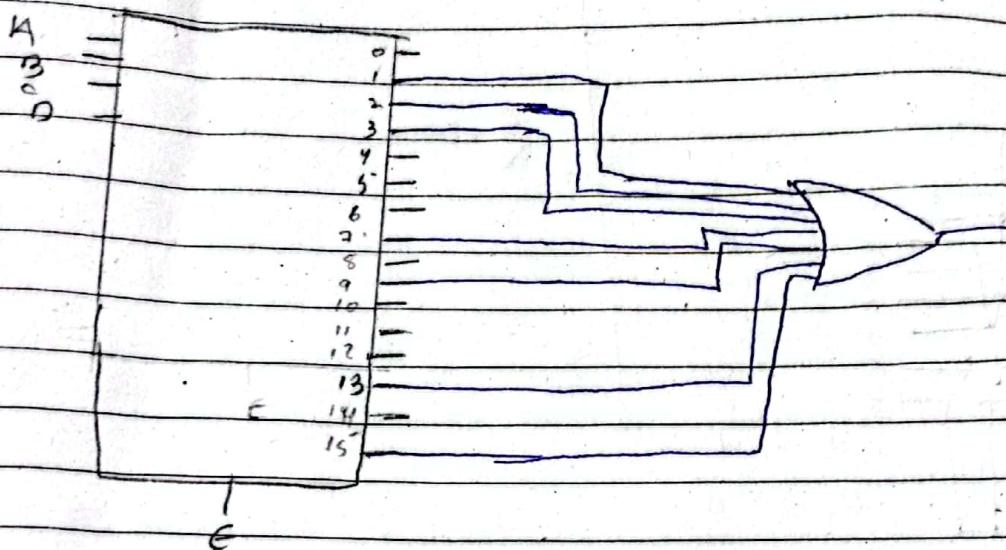


Date:

QUESTION 184



## QUESTION 15



## QUESTION 16.

 $A_3 \quad A_2 \quad A_1 \quad A_0 \quad X$ 

$$0 \begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \quad 0 \quad X=0$$

$$1 \begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 \end{pmatrix} \quad 1 \quad X=1$$

$$2 \begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 \end{pmatrix} \quad 1 \quad X=\overline{A_0}$$

$$3 \begin{pmatrix} 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{pmatrix} \quad 0 \quad X=0$$

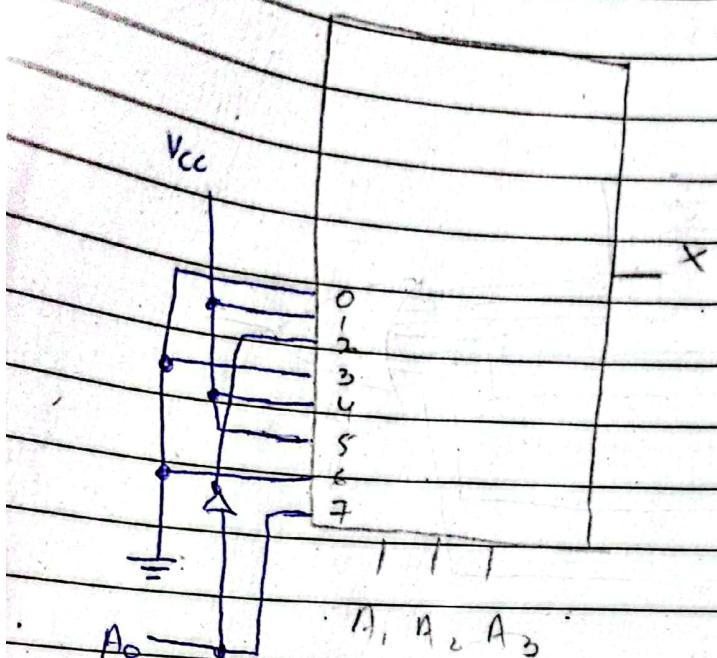
$$4 \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 \end{pmatrix} \quad 1 \quad X=1$$

$$5 \begin{pmatrix} 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 \end{pmatrix} \quad 1 \quad X=1$$

$$6 \begin{pmatrix} 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 \end{pmatrix} \quad 0 \quad X=0$$

$$7 \begin{pmatrix} 1 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \end{pmatrix} \quad 0 \quad X=A_0$$

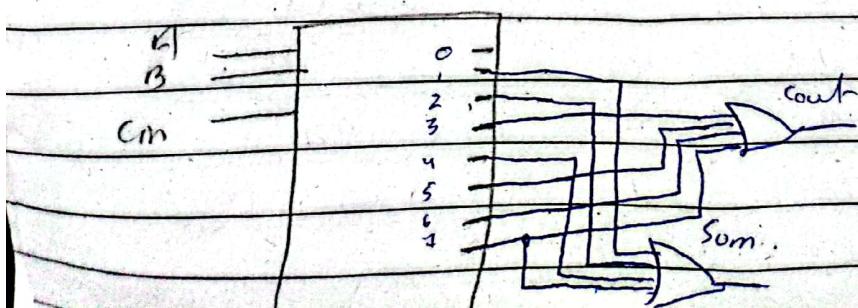
Date:



### QUESTION 17

Full adder by 3 to 8 line decoder.

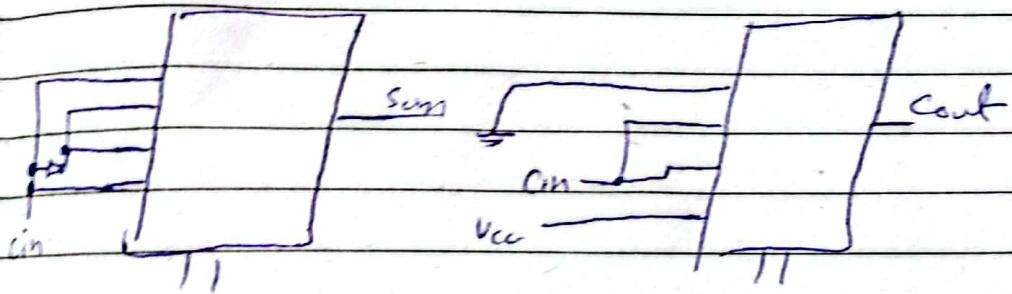
A	B	Cin	Sum	cout
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1



Date: \_\_\_\_\_

## 4x1 Multiplexers

A	B	cin	sum	Carry'
0	0	0	Open	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
0	1	0	0	1
1	1	0	0	1
1	1	1	1	1



QUESTION 18.

