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Section : 6

Ans. to the Q. no - 1

(a)

$(675.3300)_{10} = (??)_{16}$

16 | 675		
16 | 42 - 3		
16 | 2 - A		
0 - 2		

0.3300 × 16	5	0.28
0.28 × 16	4	0.48
0.48 × 16	7	0.68
0.68 × 16	A	0.88
0.88 × 16	E	0.08

$\therefore (675.3300)_{10} = (2A3.547AE)_{16}$

(b)

* $(111001101010)_2 = (??)_8$

$= \underbrace{111}_{7}\ \underbrace{001}_{1}\ \underbrace{101}_{5}\ \underbrace{010}_{2} = (7152)_8$

* $(111001101010)_2 = (??)_{16}$

$= \underbrace{1110}_{E}\ \underbrace{0110}_{6}\ \underbrace{1010}_{A} = (E6A)_{16}$

* $(111001101010)_2 = (??)_{10}$

$= 1\times2^{11} + 1\times2^{10} + 1\times2^{9} + 0\times2^{8} + 0\times2^{7} + 1\times2^{6} + 1\times2^{5} + 0\times2^{4} + 1\times2^{3} + 0\times2^{2} + 1\times2^{1} + 0\times2^{0}$

$= (3690)_{10}$

(c)

$7530 = (??)_{\text{Excess 3}}$

7	5	3	0
+3	+3	+3	+3
10	8	6	3
↓	↓	↓	↓
1010	1000	0110	0011

$\therefore 7530 = (1010\ 1000\ 0110\ 0011)_{\text{Excess 3}}$

Ans. to the Q. no - 2

$F(A,B,C,D) = \sum(3,5,6,7,9,10,11,12,13,14) + \sum_{dc}(0,8)$

AB \ CD	00	01	11	10
00	X	0	1	0
01	0	1	1	1
11	1	1	0	1
10	X	1	1	1

SOP form:-

$F = A\bar{C} + A\bar{B} + \bar{A}BD + \bar{A}C\bar{D} + BC\bar{D}$

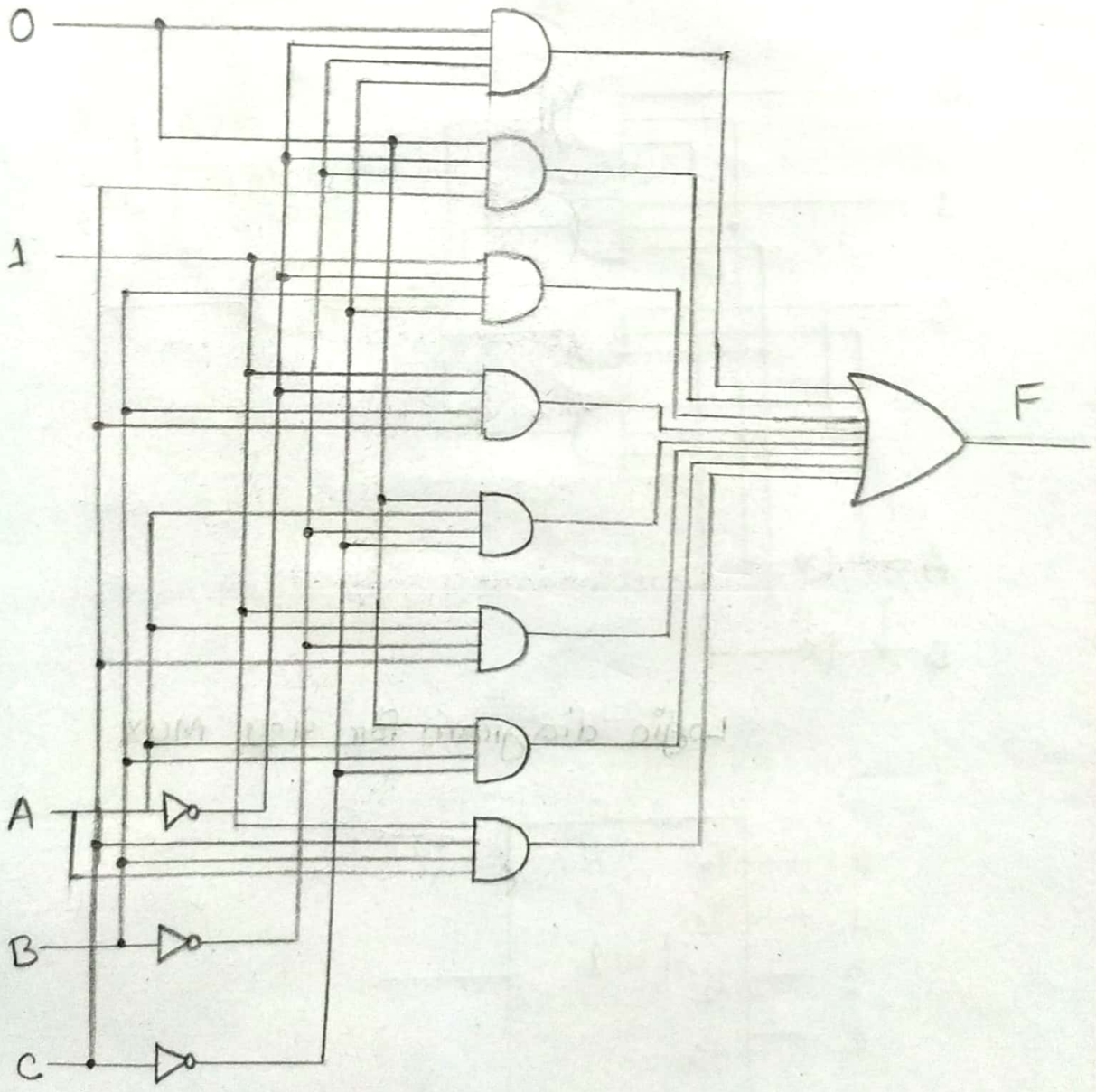
Ans. to the Q. no - 3

(a)

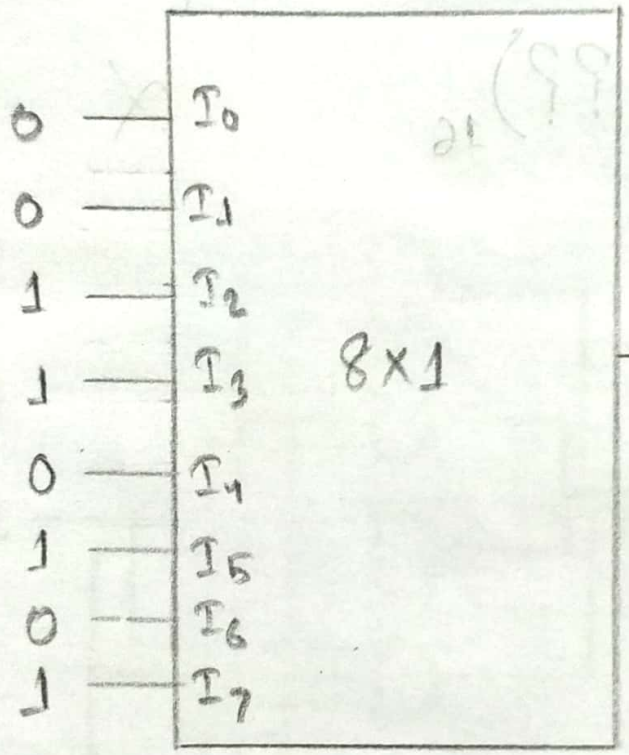
A	B	C	F	I
0	0	0	0	$I_0 = 0$
0	0	1	0	
0	1	0	1	$I_1 = 1$
0	1	1	1	
1	0	0	0	$I_2 = C$
1	0	1	1	
1	1	0	0	$I_3 = C$
1	1	1	1	

(b)

$I_0 = 0$, $I_1 = 0$, $I_2 = 1$, $I_3 = 1$, $I_4 = 0$, $I_5 = 1$, $I_6 = 0$,
$I_7 = 1$, $S_2 = A$, $S_1 = B$, $S_0 = C$ [From (a)]



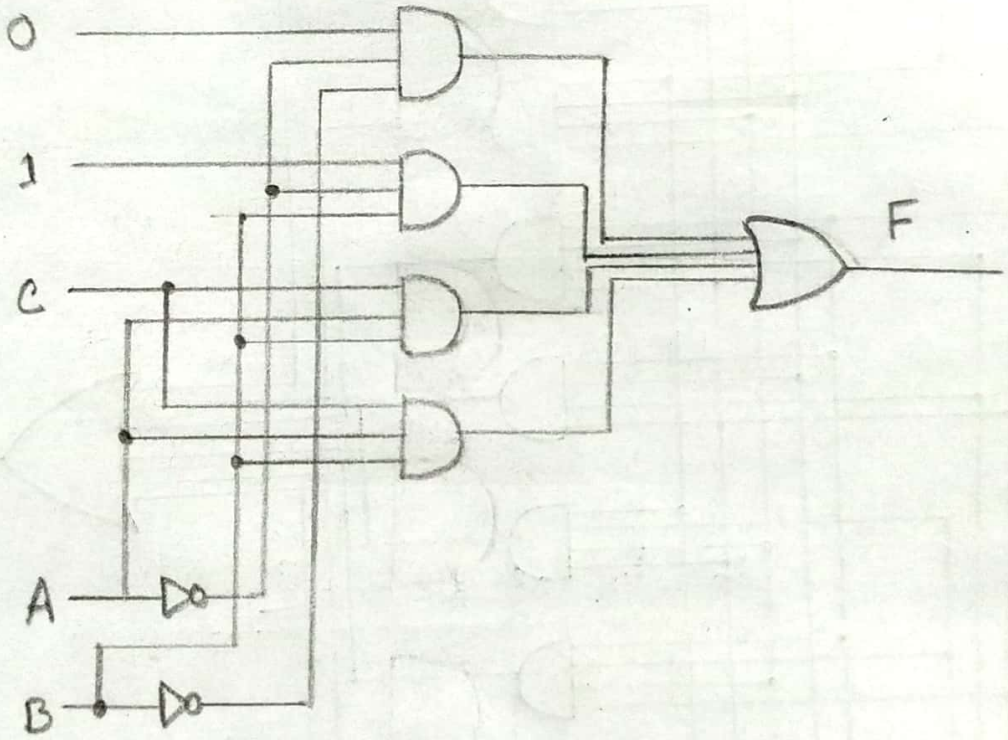
Logic diagram for 8:1 MUX



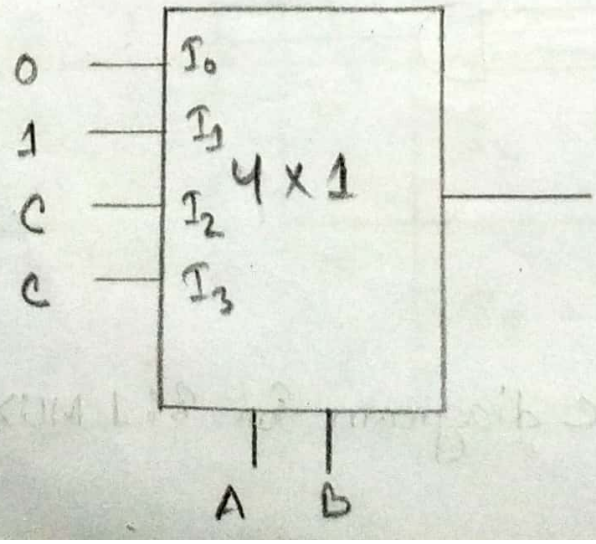
(c)

$I_0 = 0, I_1 = 1, I_2 = C, I_3 = C$ [From (a)]

$S_1 = A, S_0 = B$



Logic diagram for 4:1 MUX



Ans. to the Q. no-4

(a)

$F = xyz + wy + wx\bar{y} + \bar{x}y$

0111 1100 1100 0100
1111 1101 1101 0101
1110 0110
1111 0111

W	X	Y	Z	F
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

(b)

$$F = xyz + wy + wx\bar{y} + \bar{x}y$$

$$= xyz + w(x\bar{y} + y) + \bar{x}y$$

$$= w(x+y) + y(\bar{x} + xz)$$

$$= w(x+y) + y(\bar{x}+x)(\bar{x}+z)$$

$$= w(x+y) + y(\bar{x}+z)$$

$$= wx + wy + \bar{x}y + yz$$

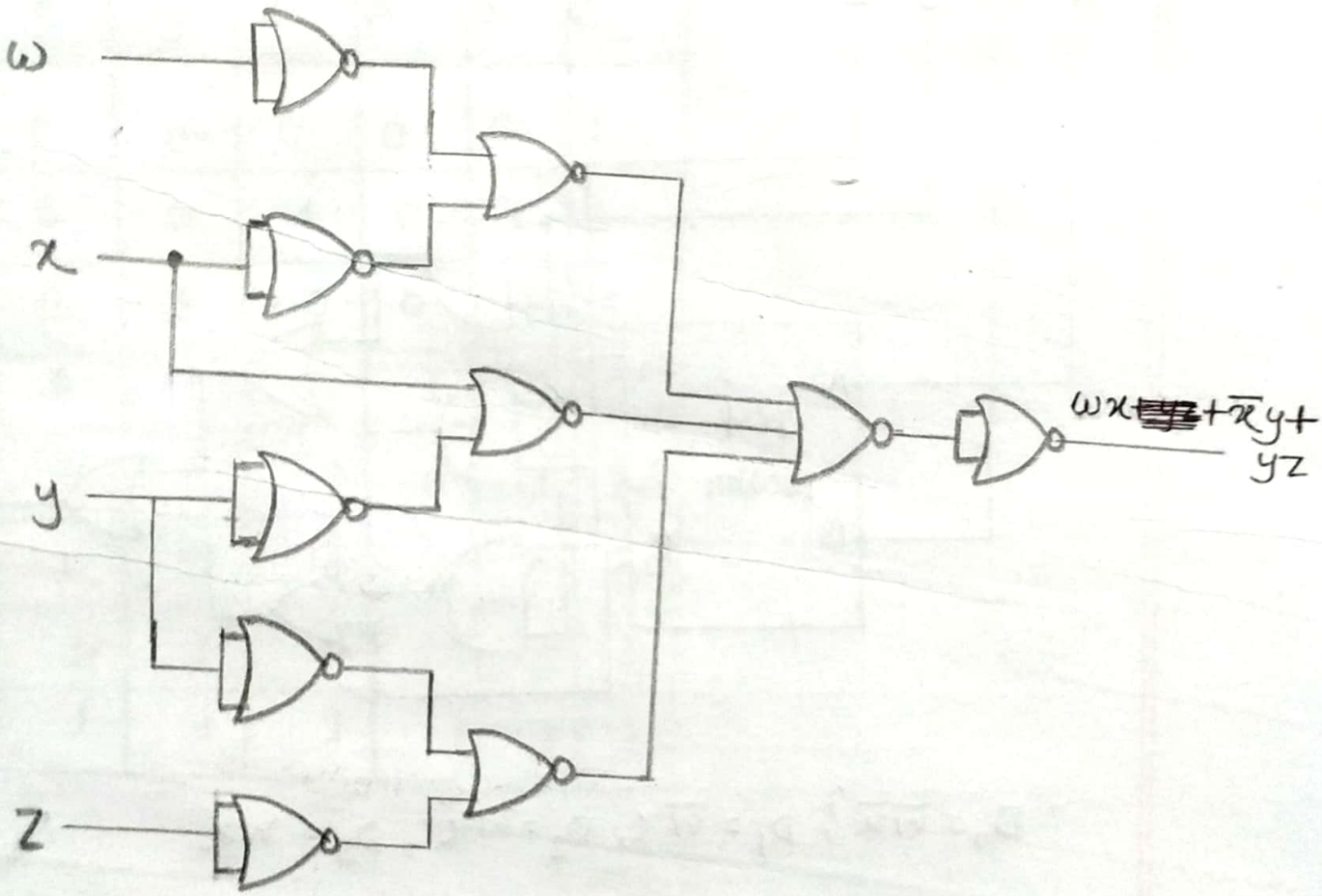
$$= wx + wy(x+\bar{x}) + \bar{x}y + yz$$

$$= wx + wxy + w\bar{x}y + \bar{x}y + yz$$

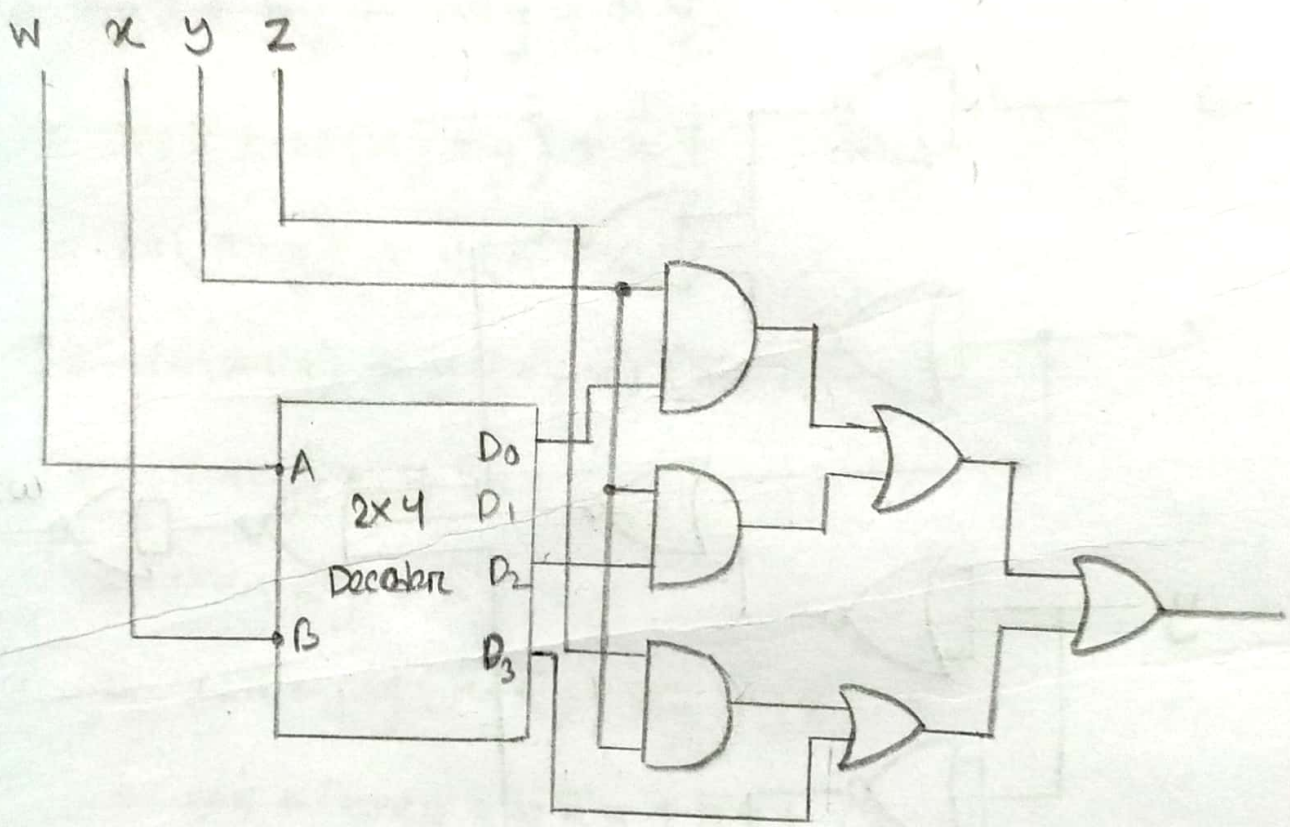
$$= wx(1+y) + \bar{x}y(w+1) + yz$$

$$= wx + yz + \bar{x}y$$

(c)



(d)



$D_0 = \overline{w}\overline{x}$, $D_1 = \overline{w}x$, $D_2 = w\overline{x}$, $D_3 = wx$

Ans. to the Q.no-5

x	y	z	A	B	C
0	0	0	0	0	1
0	0	1	0	1	0
0	1	0	0	1	1
0	1	1	1	0	0
1	0	0	0	1	1
1	0	1	1	0	0
10	1	0	1	0	1
1	1	1	1	1	1

x \ yz	00	01	11	10
0	0	0	1	0
1	0	1	1	1

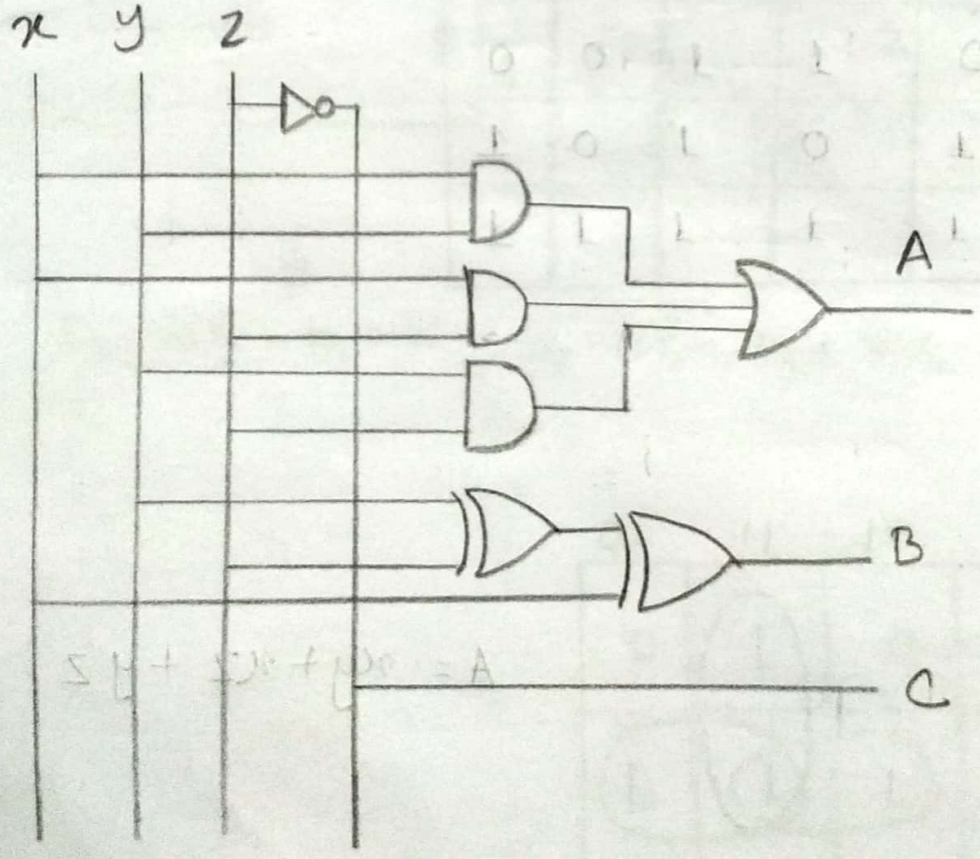
$A = xy + xz + yz$

x \ yz	00	01	11	10
0	0	(1)	0	(1)
1	(1)	0	(1)	0

$$B = x\bar{y}\bar{z} + xyz + \bar{x}\bar{y}z + \bar{x}y\bar{z}$$
$$= x(yz + \bar{y}\bar{z}) + \bar{x}(\bar{y}z + y\bar{z})$$
$$= x(\overline{y \oplus z}) + \bar{x}(y \oplus z)$$
$$= x \oplus y \oplus z$$

x \ yz	00	01	11	10
0	1	0	0	1
1	1	0	0	1

$$C = \bar{z}$$



Ans. to the Q.no-6

r	f	t	s	w
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

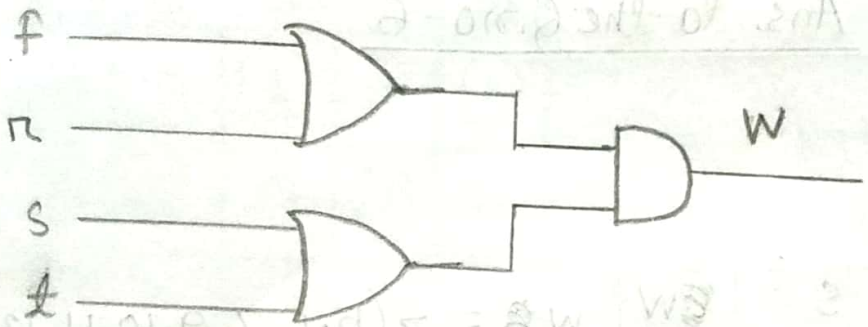
$w = \Sigma(5,6,7,9,10,11,13,14,15)$

rf \ ts	00	01	11	10
00	0	0	0	0
01	0	1	1	1
11	0	1	1	1
10	0	1	1	1

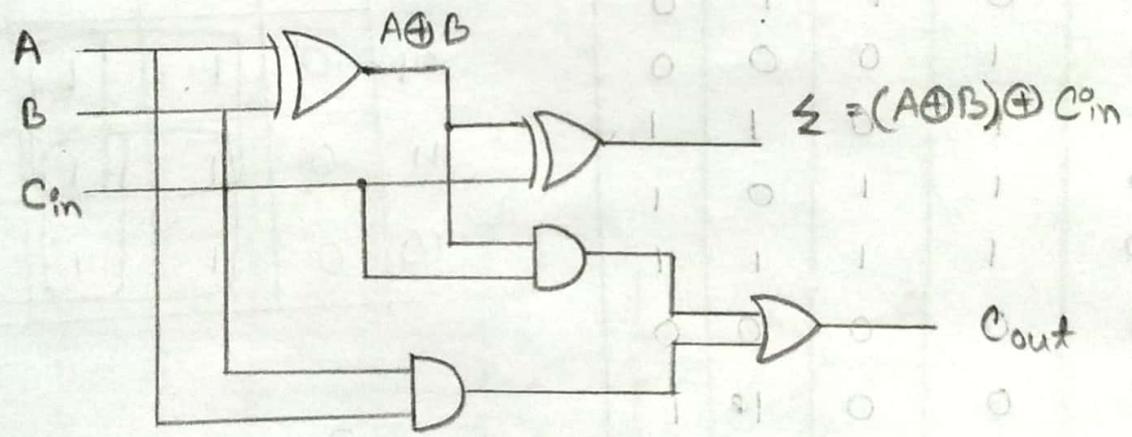
$w = \bar{f}s + r\bar{s} + f\bar{t} + r\bar{t}$

$= \bar{s}f\ s(\bar{f}+r) + \bar{t}(f+r)$

$= (f+r)(\bar{s}+\bar{t})$



Ans. to the Q.no - 7



Full adder logic diagram