(1)
Ans Given:

$$+61$$
$$+27$$

Sol

first   we   Convert   +61 &
+27   to   binary.

D		B
+61	=	0111101
+27	=	0011011
+88		1·011000

$(88)_{10} = (1011000)_2$

Ans

Now

$$+27$$
$$-61$$

Now   first   we   Convert   to
binary   then   we   take   2's
Complement   of   61.

D		B
+27	=	0011011
-61	=	0111101

first   we   take   2's   Complement
of   61.

2's Complement = 1000010
                      +1

  "   "   = 1000011

Now :

D		B
+27	=	0011011
-61	=	1000011

P   4 1 4 0

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D   B
$+27$ = 0011011
-61 = 1000011
-34 = 1011110

Now take 2's Complement of 1011110

2's Complement of 1011110 = 0100001
                                              $+1$
                                          0100010

D   B
-34 = 0100010 Ans

Now
-27
-61

In binary,

-27 = 0011011
-61 = 0111101

2's Complement of 61 = 1000011
2's   // 27 = 1100100
                                        $+1$

2's   // 27 = 1100101

P 4 1 + 0

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Now D   B

$-61 = 1\ 0\ 0\ 0\ 0\ 1\ 1$

$-27 = 1\ 1\ 0\ 0\ 1\ 0\ 1$

$-88 = 1\ 0\ 1\ 0\ 1\ 0\ 0\ 0$

Now

2's Complement of $1\ 0\ 1\ 0\ 1\ 0\ 0\ 0$

$= 0\ 1\ 0\ 1\ 0\ 1\ 1\ 1$

$+\ 1$

$0\ 1\ 0\ 1\ 1\ 0\ 0\ 0$

D   B

$-88 = 0\ 1\ 0\ 1\ 1\ 0\ 0\ 0$ Ans

(2) Ans

Given
-18

(ii) 1's Complement

Sol   D   B

$-18 = 1\ 0\ 0\ 1\ 0$

1's Complement of $18 = 0\ 1\ 1\ 0\ 1$

At least 4 bits need to represent in 1's Complement

(ii) 2's Complement

for

2's Complement of $18 = 0\ 1\ 1\ 0\ 1$

$+\ 1$

$" \qquad " \qquad " \qquad = 1\ 1\ 1\ 0$

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" In 2's Complement Also
at least "4" bits nce d to
to represent -18 .

(i) Sign-megnitud: -18 = 10010
in Sign-megnitude no of bit itleast "5".

Q3:

A	B
000	0
001	1
010	3
100	4
101	5
110	6
111	7

Q4:

A	B
0 0 0	+ 0
0 0 1	+ 1
0 1 0	+ 2
0 1 1	+ 3
1 0 0	- 3
1 0 1	- 2
1 1 0	- 1
1 1 1	- 0

Q5:

A	B
0 0 0	+ 0
0 0 1	- + 1
0 1 0	+ 2
0 1 1	+ 3
1 0 0	- 4
1 0 1	- 3
1 1 0	- 2
1 1 1	- 1
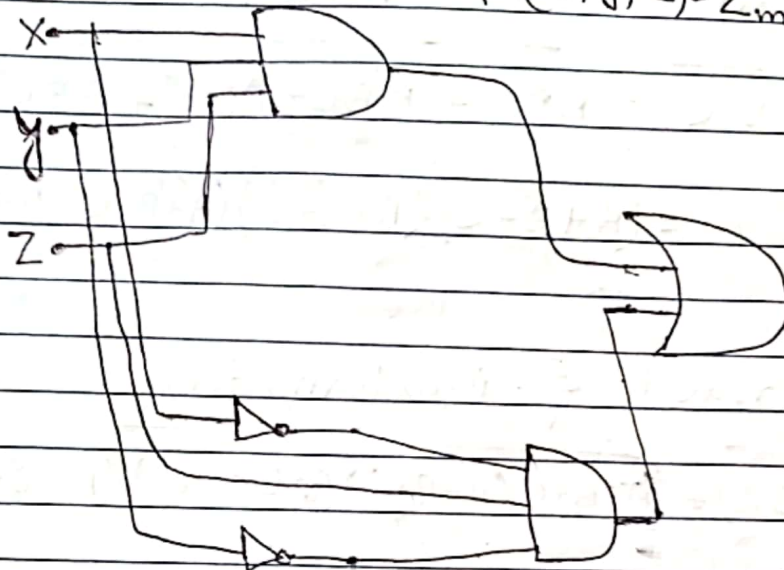
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Q6: (i) $F(A,B,C)$

↳ Sum of minterm form

$$F(A,B,C) = \sum_m (2,3,4,6)$$

$$= m_2 + m_3 + m_4 + m_6$$

$$F(A,B,C) = A'BC' + A'BC + AB'C' + ABC'$$

→ product of Maxterm form

$$F(A,B,C) = \prod_M (0,1,5,7)$$

$$= M_0 \bullet M_1 \bullet M_5 \bullet M_7$$

$$= (A+B+C)(A+B+C')(A'+B+C')(A'+B'+C')$$

$$\underset{=}{Ans}$$

$$P \quad q \quad \overline{1} + c$$

(ii) $F(A,B,C)$

$\rightarrow$ Sum of minterm form

$F(A,B,C) = \overline{A'BC'} + \overline{A'BC} + AB'C' + ABC'$

$= (A+B'+C)(A+B'+C')(A'+B+C)(A'+B'+C)$

Ans

$\rightarrow$ Product of Maxterm form

$F(A,B,C) = \overline{(A+B+C)(A+B+C')(A'+B+C')(A'+B'+C')}$

$= A'B'C' + A'B'C + AB'C + ABC$

Ans

$\smile$ —— xx —— $\smile$ —— xx $\smile$ —— $\smile$ —— x x $\checkmark$

Q7: Given:

$\overline{F(A,B,C)} = \overline{B}\cdot C + A\cdot(\overline{B}+C) + A\cdot\overline{C}$

A	B	C	F(A,B,C)
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

Ans

(8) Ans: Circuit Diagram:

$$F(x,y,z) = \sum_m (1,7)$$

Price

$$2 \, AND + 2 \, NOT + 1 \, OR$$
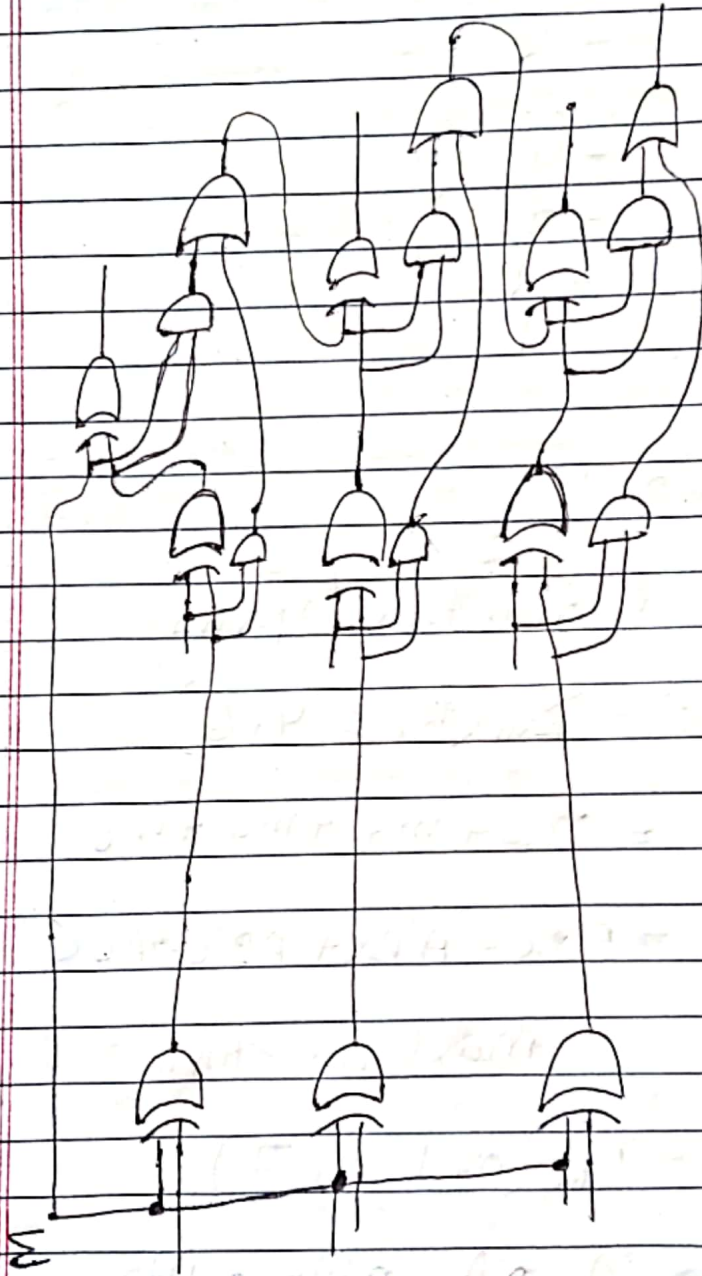$$2(2) + 2(1) + 2$$
$$4 + 2 + 2$$

Price = $8/-

P y TPO

Q9. Circuit Diagram!

the   END