

CSF 260

MID TERM

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sec: 01

Ans to the or no 2

010111000000
1010101101

Took money, $(7C6)_{16}$

$$= 7 \times 16^2 + 12 \times 16^1 + 6 \times 16^0$$

$$= (1990)_{10}$$

money left = $(1101)_9$

$$= 1 \times 9^3 + 1 \times 9^2 + 0 \times 9^1 + 1 \times 9^0$$

$$= (811)_{10}$$

Now,

$$(811)_{10} \rightarrow (01100101011)_{2's}$$

$$(-811)_{10} \rightarrow (10011010101)_{2's}$$

And

$$(1990)_{10} \rightarrow (11111000110)_{2's}$$
$$\Rightarrow (00000111010)_{2's}$$

$$\begin{array}{r} \text{Now, } (+1990)_{10} = (11111000110)_{2's} \\ (-811)_{10} \quad (10011010101)_{2's} \\ \hline 110010011011 \end{array}$$

←
discard carry out

$$\text{Ans: } (10010011011)_{2's} = (1179)_{10}$$

(b)

since the MSB of the 2's complement addition of $(+1990)_{10} - (811)_{10}$ is the same as both the MSB's of these numbers 2's complement.

∴ There is no overflow.

Ans to the or no 2

Given,

$$\begin{aligned} & (b' \cdot (ac + bd) + a'c(b(1+d))' + bc)(a + a'd') \\ &= (b' \cdot (ac + bd) + a'c(b(1))' + bc)(a + a'd') \quad [x+1=1] \\ &= (b' \cdot (ac + bd) + a'c(b \cdot 0) + bc)(a + a'd') \quad [x'=0] \\ &= (b' \cdot (ac + bd) + a'c \cdot 0 + bc)(a + a'd') \quad [x \cdot 0 = 0] \\ &= (b' \cdot (ac + bd) + bc)(a + a'd') \quad [x \cdot 0 = 0] \\ &= (b'ac + b' \cdot bd + bc)(a + a'd') \quad [\text{Distributive law}] \\ &= (b'ac + 0 \cdot d + bc)(a + a'd') \quad [x \cdot x' = 0 \text{ compliment}] \\ &= (b'ac + bc)(a + a'd') \end{aligned}$$

$$= ab'ac + abc + a'd'b'ac + a'd'bc \quad [\text{Distribution}]$$

$$= \cancel{a}a \cdot a \cdot b'c + abc + a' \cdot a \cdot b'd'c + a'bcd'$$

$$= ab'c + abc + a'bcd'$$

$$\begin{cases} x \cdot x = x \\ x' \cdot x = 0 \end{cases}$$

$$= ac(b' + b) + a'bcd' \quad [x' + x = 1]$$

$$= ac + a'bcd'$$

\therefore simplified form of the given expression is $ac + a'bcd'$

Ans to the q no 3

Here, $F = 1$: ① $F = 1 (D = 0 + D = 1) \cdot W = 1$

if $F = 1, C = 0, H, W \neq 1$

② $C = 1$: ① $(T = 1 + T = 0) \cdot D = 1$
 $H = 1$

When, $H, W = 0$, if $D = 1, F = 1$

if $D = 0, C = 1$

	T	H	D	W	F	C
0	0	0	0	0	0	1
1	0	0	0	1	0	0
2	0	0	1	0	1	0
3	0	0	1	1	0	0
4	0	1	0	0	0	0
5	0	1	0	1	X	X
6	0	1	1	0	0	1
7	0	1	1	1	0	X
8	1	0	0	0	0	1
9	1	0	0	1	1	0
10	1	0	1	0	1	0
11	1	0	1	1	1	0
12	1	1	0	0	0	0
13	1	1	0	1	X	X
14	1	1	1	0	0	1
15	1	1	1	1	X	X

8 or 10 out of 16

TH \ PW	00	01	11	10
	0	1	3	2
00				1
01	4	5	7	6
11	12	13	15	14
10	8	9	11	10

$$Y = H' D' W' + T H' W$$

TH \ DW	00	01	11	10
	0	1	3	2
00	1			
01	4	5	7	6
11	12	13	15	14
10	8	9	11	10

$$Y = H' D' W' + H D W'$$