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RC21534

Question 1

1. A
2. C
3. D
4. D
5. B
6. D
7. A
8. B
9. D
16. A

Question 2

a) $3410_{10} = 110101010010_2$

2	3410	0
2	1705	1
2	852	0
2	426	0
2	213	1
2	106	0
2	53	1
2	26	0
2	13	1
2	6	0
2	3	1
	1	

b) $1010_2 = 10_{10}$

$1010_2 = A_{16}$

$(1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (0 \times 2^0)$

$= 10_{10}$

$= A_{16}$

c) i) $3610_{10} = 1110\ 0001\ 1010_2$

2	3610	0
2	1805	1
2	902	0
2	451	1
2	225	1
2	112	0
2	56	0
2	28	0
2	14	0
2	7	1
2	3	1
	1	

ii) $3610_{10} = E1A_{16}$

16	3610	10
16	225	1
	14	

d) i) $+33 = 00100001$

2	33	1
2	16	0
2	8	0
2	4	0
2	2	0
	1	

ii) $-35 = 1101\ 1101$

2	35	1
2	17	1
2	8	0
2	4	0
2	2	0
	1	

$+35 = 0010\ 0011$

$-35 = 1101\ 1100$ (1's C)

$-35 = 1101\ 1101$ (2's C)

iii)

$$\begin{array}{rr} & 0010\ 0001 \quad (+33) \\ + & 1101\ 1101 \quad (-35) \\ \hline & 1111\ 1110 \quad (-2) \end{array}$$

Question 3

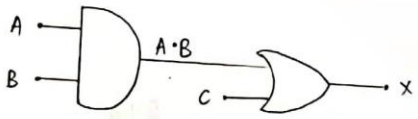
a) i) OR

X	Y	Z	X+Y+Z
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

ii) NAND

X	Y	Z	$\overline{XYZ}$
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

b)



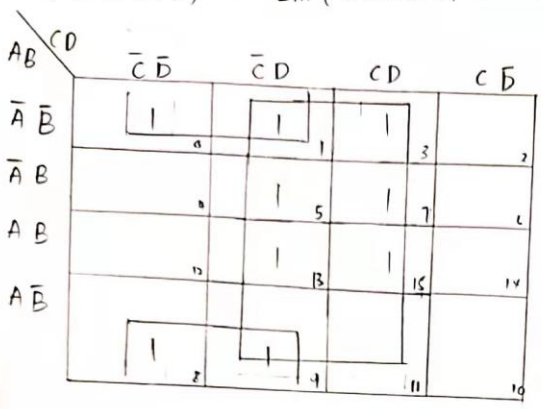
$X = (A \cdot B) + C$

When $A = 1$, $B = 0$ & $C = 1$

A	B	C	(A·B)+C
1	0	1	1

∴ value of x is 1

c) $F(A, B, C, D) = \Sigma m(0, 1, 3, 5, 7, 8, 9, 11, 13, 15)$



① $\bar{A}\bar{B}, A\bar{B} = \bar{B} \Rightarrow \bar{B}\bar{C}$

$\bar{C}\bar{D}, \bar{C}D = \bar{C}$

$\bar{C}D, CD = D \Rightarrow D$

$F(A, B, C, D) = \bar{B}\bar{C} + D.$

d) $\overline{(A + B)} \quad (C + D)\bar{C}$