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SECTION: 2A

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ASSIGNMENT No 4

D L D

Digital Logic Design.

QUESTION # 1

1

Convert Expression $AC + (A + B'C)(AC + B)$ to Standard SOP and Standard Pos.

Sol

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

$$X = AC + A.AC + AB + AB'C.C + B.B'C$$

$$X = AC + AC + AB + AB'C + 0$$

$$X = AC + AB + AB'C$$

$$X = AC(1) + AB(1) + AB'C$$

$$X = AC(B + B') + AB(\overset{C}{1} + \overset{C'}{0}) + AB'C$$

$$X = ABC + BAC + AB.C + AB.C' + AB'C$$

Because $B + B' = 1$

$$C + C' = 1$$

$$X = ABC + AB'C + ABC + ABC' + AB'C$$

$$X = ABC + AB'C + ABC' \rightarrow \text{is the SSOP.}$$

Because Domain all variables are present.

$$D = \{A, B, C\}$$

For converting in Standard POS we use SSOP.

$$X = ABC + AB'C + ABC' \rightarrow \text{SSOP}$$

We put 1 at 111, 101, 110.

A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

Where 0 coming note that terms
 $\bar{A} = 1, A = 0$

$$X = (A+B+c)(A+B+\bar{c})(A+\bar{B}+c)(A+\bar{B}+\bar{c})(\bar{A}+B+c)$$

Standard Product of Sum Expression.

$$\text{Domain} = \{A, B, C\}$$

Question No 2

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	0	0

SOP Expression

$$X = (\bar{A} \bar{B} C) + (\bar{A} B C) + (A \bar{B} C) \leftarrow \text{SSOP}$$

Using K-Map

A	BC			
	00	01	11	10
0		1	1	
1		1		

$$X = \bar{B}C + \bar{A}C$$

$$\boxed{X = C(\bar{A} + \bar{B})}$$

Now Pos term

$$X = (A+B+C)(A+\bar{B}+C)(\bar{A}+B+C)$$

$$(\bar{A}+\bar{B}+C)(\bar{A}+\bar{B}+C)$$

$$X = (A+B+C)(A+\bar{B}+C)(\bar{A}+B+C)(\bar{A}+\bar{B}+C)$$

	00	01	11	10
0	1			1
1	1			1

$$X = A + \bar{A} + BC + \bar{B}C$$

$$\boxed{00 \ A + \bar{A} = 1}$$

$$X = 1 + C(B + \bar{B})$$

$$B + \bar{B} = 1$$

$$\boxed{X = C} \rightarrow \text{Simplified form.}$$

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