Name:
Saad Ahmad

Roll no:
20P-0051

Section:
BS(CS)-2D

Question # 1

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

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

First we will convert the expression in SOP form.

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

$AC+AAC+AB+A\bar{B}CC+B\bar{B}C$

$AC+AC+AB+A\bar{B}C+(0)C \quad (\because A\cdot A=A\ ,\ B\cdot\bar{B}=0)$

$AC+AB+A\bar{B}C \quad (\because A+A=A)$

$Ac+A\bar{B}C+AB\cdot$

$Ac(1+\bar{B})+AB$

$AC(1+\bar{B})+AB$

$AC+AB$ — (1) $(\because 1+\bar{A}=1)$

Now we will convert eq(1) in standard SOP form, so.

$AC+AB.$

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

$AC=$

$AC \times 1$

$AC(B+\bar{B})$ $(\because A+\bar{A}=1)$

$ABC+A\bar{B}C$

$AB=$

$AB \times 1$

$AB(C+\bar{C})$ $(\because A+\bar{A}=1)$

$ABC+AB\bar{C}$

Now Putting the values in eq(1), we get

$ABC+A\bar{B}C+ABC+AB\bar{C}$

$ABC+ABC+A\bar{B}C+AB\bar{C}$

$ABC + A\bar{B}C + \bar{A}BC + AB\bar{C}$

$ABC + A\bar{B}C + AB\bar{C}$ —② $(\because A+A=A)$

Eq ② is the standard SOP form.

Now for converting the expression in standard POS form we will take help of standard SOP form, so.

$ABC + A\bar{B}C + AB\bar{C}$

We will find the binary number of the above SOP form, so

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

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

Missing binary numbers are 000, 001, 010, 011, 100, so the standard POS form will be

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

The above expression is Standard POS form.

Question # 2

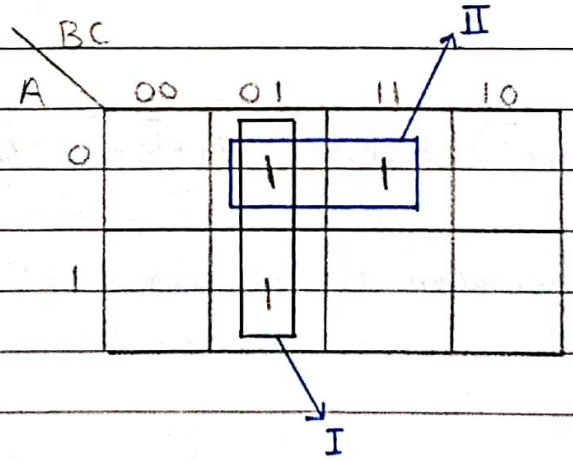
A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

SOP:

0 = complement

1 = as it is

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



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

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

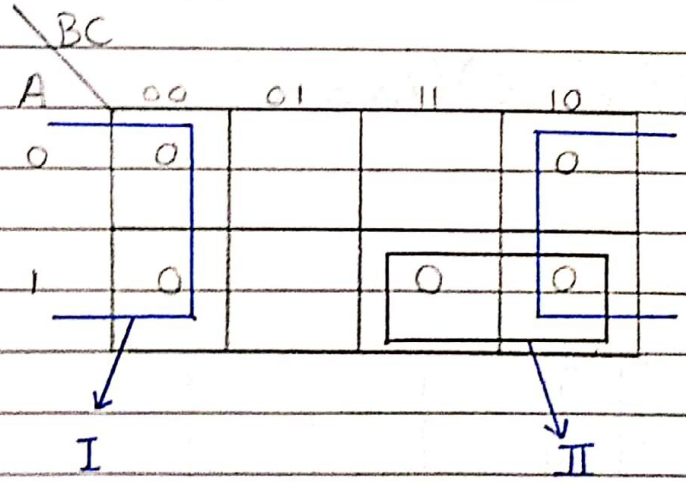
$F = C(\overline{AB})$.

POS:

0 = as it is

1 = complement

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



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