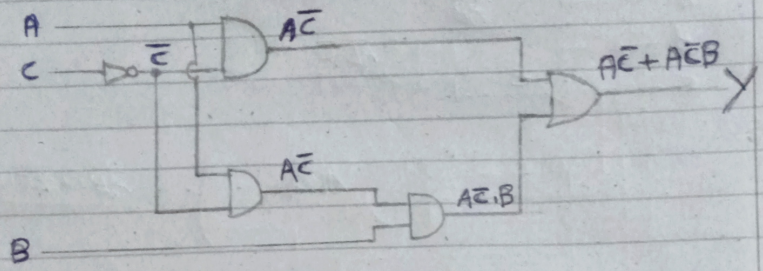
Q3
Part (a)



The truth table for the above boolean expression are given below.

A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$A\bar{C}$	$AB\bar{C}$	$A\bar{C}+A\bar{C}B$
0	0	0	1	1	1	0	0	0
0	0	1	1	1	0	0	0	0
0	1	0	1	0	1	0	0	0
0	1	1	1	0	0	0	0	0
1	0	0	0	1	1	1	0	1
1	0	1	0	1	0	0	0	0
1	1	0	0	0	1	1	1	1
1	1	1	0	0	0	0	0	0

Truth Table

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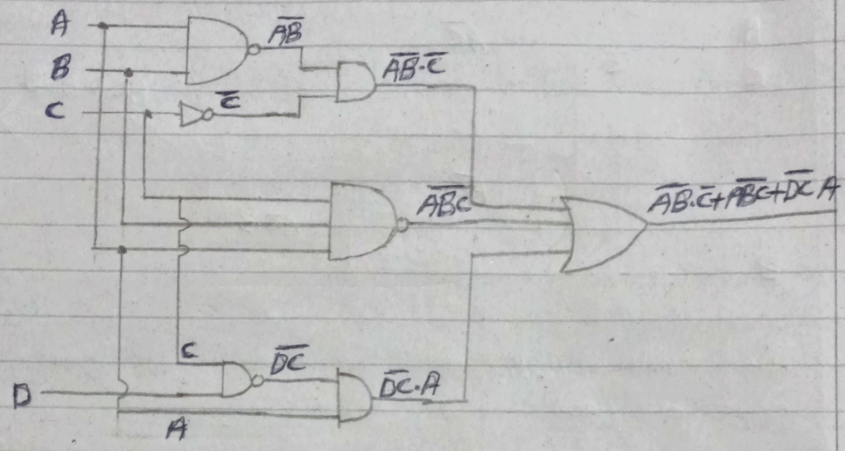
part (b) Draw logic diagram

$\bar{A}\bar{B}.\bar{C} + \bar{A}BC + \bar{D}CA$



Q 1
Ans

③ $(10110)_2 - (11101)_2$ using 1's complement methode.

Sol:→

$(10110)_2 - (11101)_2$

↓ Take complement

$(00010)_2$

Now

$$\begin{array}{r} 10110 \\ +\ 00010 \\ \hline 11000 \end{array}$$

So there is no carry in the last so the number is negative and take the once complement.

11000

↓ 1's complement

$\boxed{-00111}$ Ans.

④ $(11011.10)_2 - (11001.01)_2$

↓ 1's complement

Sol: $(00110.10)_2$

Now

P.T.O

So: 11011.10
+ 00110.10
① 00010.00
↳ carry

Now add 1 carry with answer.

So

00010.00
+1
00010.01

The number is positive.

② $-(0111.111)_2 - (1110.001)_2$

Sol:-

2's complement of subtracted number and then add 1

1110.001 → 2's complement
0001.110
+1
0001.111

Now add the above number with $(0111.111)_2$

0111.111
0001.111
1001.110 There is no carry in th answer so take again 2's complement and add +1

0110.001
1
0110.010

So the final answer is $\boxed{-0110.010}$ Ans.

⑤ $11010111 + 10010101 + 00110100$

Sol:

$$\begin{array}{r} 11010111 \\ 10010101 \\ \hline 00101100 \end{array}$$

① $(1101.101)_2 - (1010.11)_2$ using 2's complement.

Sol:

Here: $A = 1101.101$, $B = 1010.110$

We have to find $= A - B$

First find 2's complement of $B = 1010.110$

Note: 2's complement of a number is 1 added to its 1's complement number. 1's complement of 1010.110 is

$$\begin{array}{r} 1111.111 \\ -\ 1010.110 \\ \hline 0101.001 \end{array}$$

Now add 1:

$0101.001 + 0.001 \Rightarrow 0101.010$

Now add the 2's complement of B to A

$$\begin{array}{r} 1101.101 \\ 0101.010 \\ \hline (1)0010.111 \end{array} \Rightarrow$$

So answer is $\boxed{(0010.111)_2}$

Q2
Ans

part① Convert $(FA8203)_{16}$ to decimal

Sol:

As we know

$\Rightarrow F \times 16^5 + A \times 16^4 + 8 \times 16^3 + 2 \times 16^2 + 0 \times 16^1 + 3 \times 16^0$

$\Rightarrow 15 \times 16^5 + 10 \times 16^4 + 8 \times 16^3 + 2 \times 16 + 0 \times 16^1 + 3 \times 16^0$

$\Rightarrow 15728640 + 655360 + 32768 + 512 + 3$

$\Rightarrow 16417283_{10}$

Hence

$(FA8203)_{16} = (16417283)_{10}$

part② Convert $(13.23)_{10}$ to binary

Sol: $13 + 0.23$

2	13
2	6 — 1
2	3 — 0
2	1 — 1
	0 — 1

$13 = 1101$

$0.23 \times 2 = 0.46 \quad 0$

$0.46 \times 2 = 0.92 \quad 0$

$0.92 \times 2 = 1.84 \quad 1$

$0.23 = 001$

So

$(13.23)_{10} = (1101.001)_2$

Part ① Convert $(1010.1011)_2$ to decimal

Sol:

As we know

1	0	1	0	.	1	0	1	1
2^3	2^2	2^1	2^0		2^{-1}	2^{-2}	2^{-3}	2^{-4}
1	0	1	0	.	1	0	1	1

$8 + 0 + 2 + 0 \cdot (-2) + 0 + (-8) + (-16)$

$8 + 2 \cdot 0.5 + 0.125 + 0.625$

$(10.25)_{10}$

So

$(1010.1011)_2 = (10.25)_{10}$

Part ③ $(F48A)_{16}$ to $(?)_8$

Sol:

F 4 8 A

1111 0100 1000 1010

Mak pair of 3 From Right Side

001	111	010	010	001	010
$2^2 2^1 2^0$	$2^2 2^1 2^0$	$2^2 2^1 2^0$	$2^2 2^1 2^0$	$2^2 2^1 2^0$	$2^2 2^1 2^0$
1	4+2+1	2	2	1	2
1	7	2	2	1	2

So

$(172212)_8$

Hence

$(F48A)_{16} = (172212)_8$

④ $(12.34)_8 = (\ ?\ )_{16}$

Sol:-

$(12.34)_8 = (\text{\_\_\_\_})_{16}$

first convert octal to binary

1	2	.	3	4
001	010	.	011	100

$\therefore (12.34)_8 = (1010.011100)_2$

Now convert binary to Hexadecimal.

$(1010.011100)_2 = (\text{\_\_\_\_})_{16}$

Mak the pairs of four.

1010	.	0111	0000
10		7	0

$\therefore (1010.011100)_2 = (10.70)_{16}$

So 10 = A

$\therefore (12.34) = (A.70)_{16}$