

Name Mianadad Khaz

ID- 14730

Q2 Convert each of the following

a) $45.25_{10} = (?)_2$

$$101101.01$$

$$(45.25)_{10} = (101101.01)_2$$

2	45.25
2	22.625 - 1
2	11.3125 - 0
2	5.625 - 1
2	2.8125 - 1
	1.40625 - 0

$$0.25 \times 2 = .50$$

$$0.50 \times 2 = 1.00$$

b) $10000000.1010_2 = (?)_{10}$

$$1 \times 2^8 + 0 \times 2^7 + 0 \times 2^6 + 0 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 + 1 \times 2^{-1} + 0 \times 2^{-2}$$

$$1 \times 2^8 + 0.5 + 0.125$$

$$256 + 0.625$$

$$(256.625)_{10}$$

c) $(4D7F)_{16} = (?)_{10}$

$$4 \times 16^3 + 13 \times 16^2 + 7 \times 16^1 + 15 \times 16^0$$

$$16384 + 3328 + 112 + 15$$

$$19839$$

2d)

$$128_{10} = (?)_{16}$$

Sol:

~~128~~ ~~128~~ ₁₀ = ~~(?)~~ ₁₆

$$\begin{array}{r} 128 \\ \hline 8 \\ 16 \overline{) 128} \\ \underline{128} \\ 0 \end{array}$$

$$128_{10} = 0_{16}$$

Not possible.

e)

$$3ABF_{16} = (?)_2$$

First

Sol: 3 10 6 15

Now convert to binary

$$\begin{array}{cccc} \underline{3} & \underline{10} & \underline{6} & \underline{15} \\ 0011 & 1010 & 0110 & 1111 \end{array}$$

Now arrange

$$(0011101001101111)_2$$

$$\boxed{(3ABF)_{16} = (0011101001101111)_2}$$

$$(F) \quad (1100001111100101)_2 = (?)_{16}$$

Sol:

$$\begin{array}{cccc} 1100 & 0011 & 1110 & 0101 \\ B & 3 & E & 5 \end{array}$$

$$(1100 \ 0011 \ 1110 \ 0101)_2 = (B3E5)_{16}$$

$$(g) \quad 6173_8 = (?)_{10}$$

Sol:

$$6 \times 8^3 + 1 \times 8^2 + 7 \times 8^1 + 3 \times 8^0$$

$$3072 + 64 + 56 + 3$$

$$(3195)_{10}$$

So $(6173)_8 = (3195)_{10}$

$$(h) \quad 169_{10} = (?)_8$$

Sol:

$$\begin{array}{r} 8 \overline{) 169} \\ 8 \quad 21 \quad -1 \quad \uparrow \\ \hline \quad 2 \quad -5 \end{array}$$

$$\begin{array}{r} 21 \\ 8 \overline{) 169} \\ \underline{16} \\ 9 \\ \underline{8} \\ 1 \end{array}$$

$$(251)_8$$

So

$$\boxed{(169)_{10} = (251)_8 \text{ Ans}}$$

$$\begin{array}{r} 2 \\ 8 \overline{) 21} \\ \underline{16} \\ 5 \end{array}$$

(i) $2A7D_{16} = (?)_8$

Sol: $\begin{array}{cccc} 2 & A & 7 & D \\ \hline 0010 & 1010 & 0111 & 1101 \end{array}$

~~010101~~ $\begin{array}{cccc} 010101 & 001 & 111 & 101 \\ \hline 2 & 5 & 1 & 7 & 5 \end{array}$

$(2A7D)_{16} = (25175)_8$

(j) $198 = (?)_{BCD}$

Sol: $\begin{array}{ccc} 1 & 9 & 8 \\ \hline 0001 & 1001 & 1000 \end{array}$

$198 = (0001\ 1001\ 1000)_{BCD}$ Ans

(m) $(10000\ 111\ 0000)_{BCD} = (?)_8$

Sol: $\begin{array}{ccc} 1000 & 0111 & 0000 \\ \hline 8 & 7 & 0 \end{array}$

$(10000\ 111\ 0000)_{BCD} = (870)_8$ Ans

~~(1001010)₂ = (?)_{gray}~~
 (n) $(10010\ 10)_2 = (?)_{gray}$

$\begin{array}{cc} 0100 & 1010 \\ \downarrow & \downarrow \\ 0110 & 1-111 \end{array}$

50 $(100\ 10\ 10)_2 = \text{Ans} \cdot (0110\ 1111)_{\text{gray}}$

(10) $1010\ 1111_{\text{gray}} = (?)_2$

$$\begin{array}{r} 1010 \quad 1111 \\ \swarrow \searrow \quad \swarrow \searrow \\ 1100 \quad 1010 \end{array}$$

$1010\ 1111_{\text{gray}} = (11001010)_2$ Ans

(11) $0100\ 0001 = (?)_{\text{ASCII}}$

Q21. Calculate each of the following

a) $0111\ 1111_2 - 0000\ 0111_2$

Sol:
$$\begin{array}{r} 0111\ 1111 \\ -0000\ 0111 \\ \hline \end{array}$$

01111000 Ans

(b) $01101010_2 \times 11110001_2$

$$\begin{array}{r} 01101010 \\ \times 11110001 \\ \hline 01101010 \\ 00000000 \\ 00000000 \\ 00000000 \\ 00000000 \\ 10110101 \\ 01101010 \\ 01101010 \\ 01101010 \\ \hline 1101101101010 \end{array}$$

Ans: $(1101101101010)_2$

g) $0111_1 - 1111_2 = 0000_2$

Sol: Take 2 eq

$$\begin{array}{r} 00000111 \\ 11111000 \\ \hline +1+ \\ \hline 11111001 \end{array}$$

2's complement

$$\begin{array}{r} 01111111 \\ + 11111001 \\ \hline 11111000 \end{array}$$

Ans

(d) $6D_{16} - 3F_{16}$

$$\begin{array}{r} 6D \\ - 3F \\ \hline 2E \end{array}$$

(2E)₁₆ Ans

- A = 10
- B = 11
- C = 12
- D = 13
- E = 14
- F = 15

Q 31- Apply CRC to the detail

Ans Step by Step Sol.

All the decimal num under consideration are whole numbers.

The position of each number in the decimal number represents the magnitude the number represents.

The weight of the whole num under consideration

are increasing from right to left starting from 10^0 as shown below.

$$10^5 \ 10^4 \ 10^3 \ 10^2 \ 10^1 \ 10^0 \quad \text{①}$$

step 2:

Consider the decimal number 1386
Six is in the first position from the extreme right
compare with the weights of the decimal numbers
that are whole numbers as in equation ①
The weight of the 6 in 1386 is $10^0 = 1$
Thus, the weight of 6 in 1386 is (1).

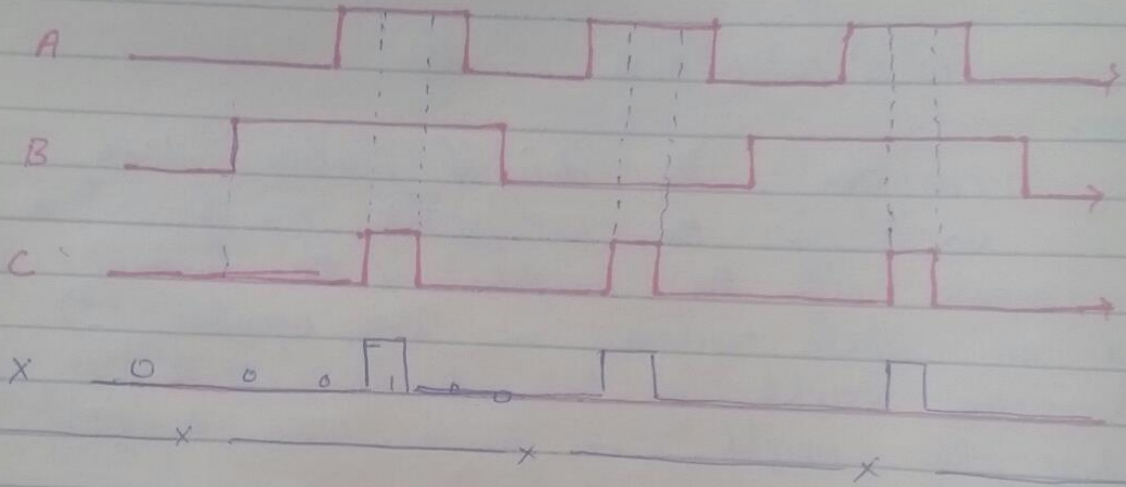
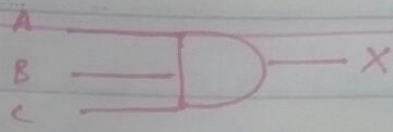
step 3:

Consider the decimal number 54692
The number is a whole number; compare it
with the representation in eq (1)
The weight of the position of 6 is
 $10^2 = 100$
Thus the weight of 6 in 54692 is 100.

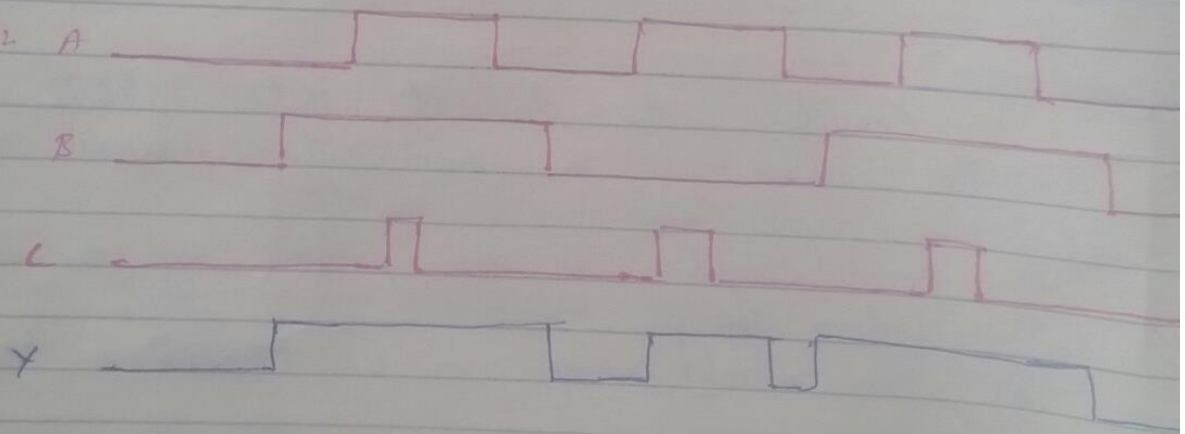
step 4:

Consider the decimal number 671920
Six is in the extreme left position and the
decimal number under consideration is a
whole number as there is no fractional
part compare it with the representation
in eq (1)
The weight of the position of 6
is $10^5 = 100000$
Thus the weight of 6 in 671920 is
100000

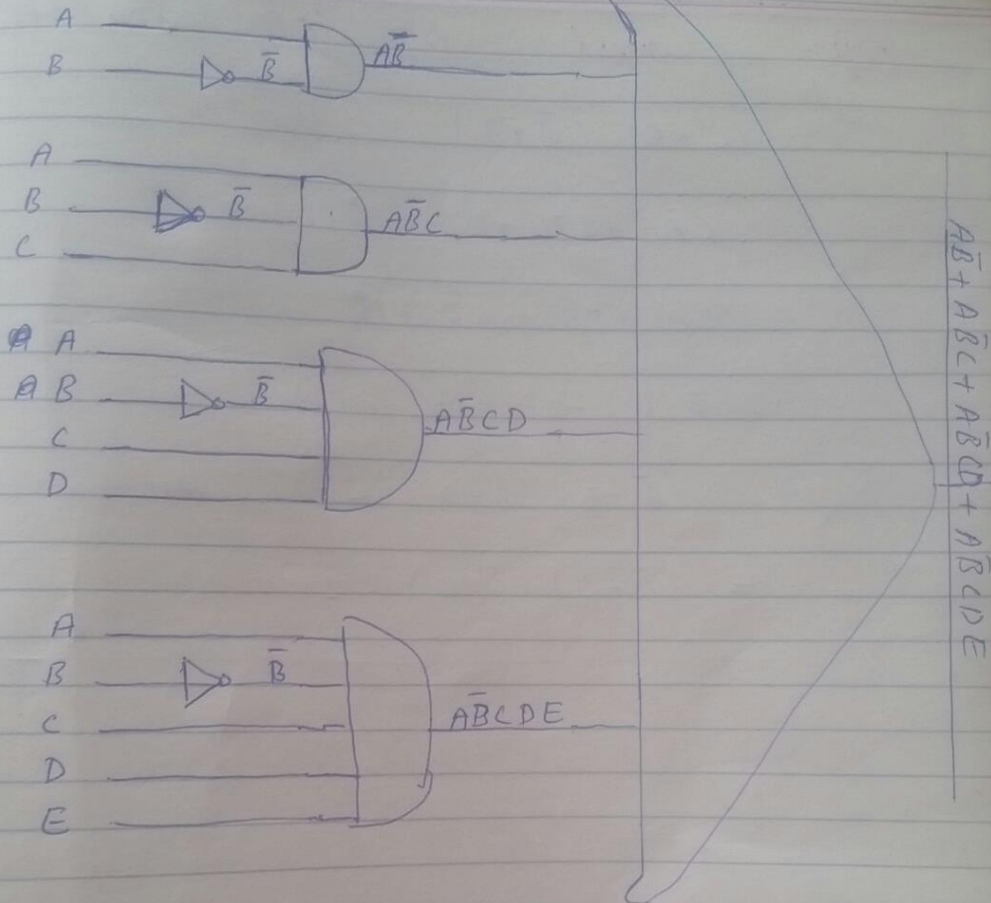
Q57-



Q62-



Q 11



Q12: Convert to SOP $(C+D)(\bar{A}+D)$

Sol:

$$\begin{aligned}
 & (C+D)(\bar{A}+D) \\
 &= (C+\bar{A}) + (CA) + D\bar{A} + D \\
 &= C + \bar{A} + D\bar{A} + CD + D \\
 &= \bar{A}(C+D) + D(C+1) \\
 &= (\bar{A}+D) \cdot (C+D) \cdot 1 \quad (C+1) = 1 \\
 &= (\bar{A}+D)(C+D) \text{ Ans}
 \end{aligned}$$