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NAME : Ibrahim Jan

ID No : 6838

Subject : DLD

Sir, Khalid Hameed

Ques: Convert each of the following number to required number system.

(A) $(1011100.10101)_2 = (\dots)_{10}$

$$\text{Ans} = 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 + 2^{-1} + 2^{-2} + 2^{-3} + 2^{-4} + 2^{-5}$$

$$\Rightarrow 64 + 0 + 16 + 8 + 4 + 0 + 0 + 0 + 0.5 + 0 + 0 + 0.125 + 0 + 0.03125 = 65$$

$$\Rightarrow \boxed{92.65625_{10}}$$

(B) 111100.101_2

$$\text{Ans} = 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 + 2^{-1} + 2^{-2} + 2^{-3}$$

$$\Rightarrow 32 + 16 + 8 + 4 + 0 + 0 + 0.5 + 0 + 0 + 0.125$$

$$\Rightarrow \boxed{60.625_{10} \text{ Ans}}$$

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(E) $(7777)_8$

$$\underline{\text{Ans}} = 7 \cdot 8^3 + 7 \cdot 8^2 + 7 \cdot 8^1 + 7 \cdot 8^0$$

$$= 3584 + 448 + 56 + 7$$

$$= \boxed{(4095)_{10}}$$

(F) $(7777)_8$

Ans $(0111011101110111)_2$

(C) $(ABCD)_{16}$

$$\underline{\text{Ans}} = 101010111001101_2$$

$$= 10 \cdot 16^3 + 11 \cdot 16^2 + 12 + 16 + 13 \cdot 16$$

$$= 40960 + 2816 + 140 + 13$$

$$= \boxed{43981} \text{ Ans}$$

(H) $(10101111)_2$

$$\underline{\text{Ans}} = 2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0$$

$$= 128 + 0 + 32 + 16 + 8 + 4 + 2 + 1$$

$$= 175_{10}$$

$$\underline{\text{Now}} \quad \frac{175}{6} = 29 \text{ R } 1 = 0.875 \times 8 = 7$$

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(G) (7777)₈

$$= \frac{7777}{16} = 486.062 = 0.662 \times 16 = 0$$

$$= \frac{486}{16} = 30.375 = 0.375 \times 16 = 6$$

$$= \frac{30}{16} = 1.875 = 0.875 \times 16 = 14$$

$$= \frac{1}{16} = 0.0025 \times 16 = 1$$

$$= (06E1)_{16}$$

(D) (10)₁₀

$$\Rightarrow \frac{10}{16} = 0.625 \times 16 = 10 = (B)_{16}$$

(E) (101010)₂

$$= 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0$$

$$= 32 + 0 + 8 + 0 + 2 + 0 = (42)_{10}$$

= Now

$$\Rightarrow \frac{42}{8} = 5.25 = 0.25 \times 8 = 2$$

$$\Rightarrow \frac{5}{8} = 0.625 \times 8 = 5 = (5E)_{8}$$

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Q. 2

A. $\overline{A\bar{B}(C+\bar{D})}$
solution

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

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

$$= \bar{A} + B + \bar{C}D \quad \underline{\text{Ans}}$$

B. $\overline{(A+\bar{B}+C+\bar{D})} + A\bar{B}C\bar{D}$
solution

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

$$= \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A} + \bar{B} + \bar{C} + \bar{D} \quad \underline{\text{Ans}}$$

Q No 3

(A) $\bar{x}\bar{y}\bar{z} + \bar{x}y\bar{z} + x\bar{y}z + \bar{x}yz + xyz$

Solution

x	y	z	x
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

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

Solution

A	B	C	D	x
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0

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Q No 4

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

Solution

$$= BC + DE B\bar{C} + DEDE$$

$$A \cdot A = A$$

$$= BC + DE B\bar{C} + DE$$

(B) $BC (\bar{C}\bar{D} + CE)$

solution

$$BC\bar{C}\bar{D} + BCCE$$

$$C \cdot \bar{C} = 0$$

$$= 0 + BCCE$$

$$C \cdot C = C$$

$$= BCE$$

(C) $B + C [B\bar{D} + (C + \bar{D})E]$

solution

$$= B + C [B\bar{D} + EC + E\bar{D}]$$

$$= B + CB\bar{D} + CEC + CE\bar{D}$$

$$C \cdot C = C$$

$$= B + CB\bar{D} + CE + CE\bar{D}$$