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Mid term exam

Subject DLD

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IQRA NATIONAL UNIVERSITY.

Q 1

Part = A.

$$(1011100.10101)_2 = (?)_{10}$$

$$\overset{6}{\uparrow}\overset{5}{\uparrow}\overset{4}{\uparrow}\overset{3}{\uparrow}\overset{2}{\uparrow}\overset{1}{\uparrow}\overset{0}{\uparrow}\quad\overset{-1}{\uparrow}\overset{-2}{\uparrow}\overset{-3}{\uparrow}\overset{-4}{\uparrow}\overset{-5}{\uparrow}$$

Sol:- 1011100.10101_2

$$2^6+2^4+2^3+2^2+2^{-1}+2^{-3}+2^{-5}$$

$$64+16+8+4+\frac{1}{2}+\frac{1}{2}+\frac{1}{2^5}$$

$$92+\frac{1}{2}+\frac{1}{8}+\frac{1}{32} = 92+\frac{16+4+1}{32}$$

$$92+\frac{21}{32}$$

$$(1011100.10101)_2 = \boxed{(92.656)_{10}} \text{ Ans.}$$

Part B.

$$(1111100.101)_2 = (\quad)_{10}$$

Sol:- $\overset{5}{1}\overset{4}{1}\overset{3}{1}\overset{2}{1}\overset{1}{0}\overset{0}{0}.\overset{-1}{1}\overset{-2}{0}\overset{-3}{1}$

$$2^5+2^4+2^3+2^2+2^{-1}+2^{-3}$$

$$32+16+8+4+0.5+\frac{1}{8}$$

$$60.625$$

$$(1111100.101)_2 = (60.625)_{10} \text{ Ans.}$$

Part C:

$$(ABCD)_{16} = (\quad)_2$$

Sol:: A B C D

Compare with table.

A	B	C	D
1010	1011	1100	1101

So $(ABCD)_{16} = (1010101111001101)_2$

Part D:

$$(10)_{10} = (\phi?)_{16}$$

Sol:: $(10)_{10} = (\quad)_{16}$

$$\frac{10}{16} = 0.625$$

$$.625 \times 16 = 10$$

$$(10)_{10} = \boxed{(10)_{16}}_{Ans}$$

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Part E

$(7777)_8 = (?)_{10}$

Sol:. $(7777)_8 = (\ )_2$

$$\begin{array}{cccc} 3 & 2 & 1 & 0 \\ 7 & 7 & 7 & 7 \\ \downarrow & \downarrow & \downarrow & \downarrow \\ 8 & 8 & 8 & 8 \end{array} = 7\times8^3 + 7\times8^2 + 7\times8^1 + 7\times8^0$$

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

$$(7777)_8 = (4095)_{10} \text{ Ans}$$

Part F.

$(7777)_8 = (\ )_2$

Sol:. $(7777)_8 = (\ )_2$

Table.

0	0 0 0
1	0 0 1
2	0 1 0
3	0 1 1
4	1 0 0
5	1 0 1
6	1 1 0
7	1 1 1

$(7777)_8 = (111111111111)_2$ Ans.

Part G.

$(7777)_8 = (\quad)_{16}$

1st binary Three pair

111 111 111 111 , make it four pairs

So According to table

15 15 15 = $(FFF)_{16}$ Ans.

Part H.

$(10101111)_2 = (\quad)_8$

Sol:

$1^7\ 0^6\ 1^5\ 0^4\ 1^3\ 1^2\ 1^1\ 1^0$

$1\times2^7 + 1\times2^5 + 1\times2^3 + 1\times2^2 + 1\times2^1$

$128 + 32 + 8 + 4 + 2 + 1$

$(175)_{10}$

$1\times8^2 + 7\times8^1 + 5\times8^0$

$64 + 56 + 5$

$(125)_8$

$(10101111)_2 = (125)_8$ Ans

Part I

$(101010)_2 = (?)_8$

Sol:. $(101010)_2 = (\ )_8$

1st we make Three pairs and Compare with table

101	010
5	2

$(52)_8$ Ans.

Part J

$(98)_{10} = (\ )_{BCD}$

Part J. Sol:. $(98)_{10} = (\ )_{BCD}$

As BCD table compair 98 with table

$(98)_{10} = (10011000)_{BCD}$ Ans.

Q 2

Part A

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

Applying demorgans Theoram

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

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

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

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

Part B

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

Applying Demorgans Theoram

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

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

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

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

Q 4

Part A

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

Sol:- $BC + DE\,B\bar{C} + DE\,DE$ $\qquad A \cdot A = A$

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

Part B

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

Sol:-

$BC\,\bar{C}\bar{D} + BCCE$ $\qquad C \cdot \bar{C} = 0$

$0 + BCCE$ $\qquad C \cdot C = C$

$\boxed{BCE}$ Ans