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Paper: D.L.D

Semester: 3rd

Assignment: Mid term

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Q. No 1 ⇒

Conversion

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

Solution :-

$(1011100.10101)_2$

$= (1\times2^6)+(0\times2^5)+(1\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(0\times2^0)+(1\times2^{-1})+(0\times2^{-2})$
$+(1\times2^{-3})+(0\times2^{-4})+(1\times2^{-5})$

$= 64+0+16+8+4+0+0+0.5+0+0.125+0+0.0312$

$= (92.6562)_{10}$

$= (1011100.10101)_2 = (92.6562)_{10}$

B. $(111100.101)_2 = (\quad)_{10}$

SOLUTION :-

$(111100.101)_2$

$(1\times2^5)+(1\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(0\times2^0)+(1\times2^{-1})+$
$+(0\times2^{-2})+(1\times2^{-3})$

$= 32+16+8+4+0+0+0.5+0+0.125$

$= 60.625$

$= (111100.101)_2 = (60.625)_{10}$

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

SOLUTION:-

A = $(1010)_2$
B = $(1011)_2$
C = $(1100)_2$
D = $(1101)_2$

$(ABCD)_{16} = (1010\ 1011\ 1100\ 1101)_2$

D- $(10)_{10} = (\quad)_{16}$

SOLUTION:-

$(10)_{10}$

Decimal	Hex
0	0
1	1
2	2
3	3
:	
10	A
11	B
12	C
:	:

So $(10)_{10} = (A)_{16}$

E. $(7777)_8 = (\quad)_{10}$

SOLUTION:-

$7\times8^3 + 7\times8^2 + 7\times8^1 + 7\times8^0$

$= 3584 + 448 + 56 + 7$

$= 4095$

$(7777)_8 = (4095)_{10}$

F: $(7777)_8 = (\quad)_2$

SOLUTION:

We know that

$(7777)_8 = (4095)_{10}$

2	4095
2	2047 - 1
2	1023 - 1
2	511 - 1
2	255 - 1
2	127 - 1
2	63 - 1
2	31 - 1
2	15 - 1
2	7 - 1
2	3 - 1
	1 - 1

$(7777)_8 = (111111111111)_2$

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

Solution:-

$(7777)_8 = (1100\ 1101\ 1111)_2$

1100 = C

1101 = D

1111 = F

$(7777)_8 = (CDF)_{16}$

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

Solution:-

$= (1\times2^7) + (0\times2^6) + (1\times2^5) + (0\times2^4) + (1\times2^3) + (1\times2^2) + (1\times2^1) + (1\times2^0)$

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

$(175)_{10}$

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

$= 64 + 56 + 5$

$= (125)_8$

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

1: $(101010)_{10} = (\quad)_8$

Solution:

$= 1\times8^5 + 0\times8^4 + 0\times8^3 + 0\times8^2 + 1\times8^1 + 0\times8^0$

$=$

$32768 + 0 + 512 + 0 + 8 + 0$

$= 33288$

$(101010)_8 = (33288)_8$

2: $(98)_{10} = (\quad)_{BCD}$

Solution:-

2	98
2	46 - 0
2	23 - 0
2	11 - 1
2	5 - 1
2	2 - 1
	1 - 0

1011100

$=$ 0101 1100

$\Rightarrow (10011000)_{BCD}$

Q: 2 Apply Demorgan theorm for each expression:.

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

Solution:-
We know that

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

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

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

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

$$= \bar{A}+\bar{C}+B+C$$ Ans:-

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

Solution:-

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

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

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

P-T-O

Day: M T W T F S (8) Date: / /

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

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

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

Q: 4

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

Solution:

= Convert into SOP

$BC + DEB\bar{C} + DDEE$

Using rule No. 7 $A.A = A$

~~$BC +$~~

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

$BC + DE(1 + B\bar{C})$

Using rule No. 2 $A + 1 = 1$

$X = BC + DE$

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

Solution:

Convert into SOP

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

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

Using rule No 8 $A.\bar{A} = 0$

$BD(0) + BCCE$

$BCCE$ Ans

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

Solution:

Convert into SOP

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

$= B(1+CD) + C(C\bar{E} + CE\bar{D}$

Using rule No. 2 $A+1=1$

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

Using rule No. 7 $A \cdot A = A$

$= B + (CE + CE\bar{D})$

Using rule No. 2 $A+1=1$

$\boxed{X = B + CE}$ Required SOP

Day: M T W T F S Date: / /

Q = 3

A:-

$$\bar{x}\bar{y}\bar{z} + \bar{x}y\bar{z} + x\bar{y}z + \bar{x}yz + xyz$$

x	y	z	$\bar{x}$	$\bar{y}$	$\bar{z}$	$\bar{x}\bar{y}\bar{z}$	$\bar{x}y\bar{z}$	$x\bar{y}z$	$\bar{x}yz$	xyz	$\bar{x}\bar{y}\bar{z} + \bar{x}y\bar{z} + x\bar{y}z + \bar{x}yz + xyz$
0	0	0	1	1	1						
0	0	1	1	1	0						
0	1	0	1	0	1						
0	1	1	1	0	0						
1	0	0	0	1	1						
1	0	1	0	1	0						
1	1	0	0	0	1						
1	1	1	0	0	0						

$\bar{x}\bar{y}\bar{z}$	$\bar{x}y\bar{z}$	$x\bar{y}z$	$\bar{x}yz$	$xy\bar{z}$	$\bar{x}\bar{y}\bar{z} + \bar{x}y\bar{z} + x\bar{y}z + \bar{x}yz + xyz$
1	0	1	1	0	1
0	0	0	1	1	1
0	0	0	0	0	0
0	1	1	1	0	1
0	0	1	0	0	1
0	0	0	1	1	1
0	1	1	1	0	1
0	0	0	0	1	1

Day: M T W T F S

Date: / /

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