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Subject: Digital logic

MiD term Assignment.

MID TERM ASSIGNMENT

Ans to the Q.NO.1

Octal to Decimal:

$(26.24)_8$

Solution:

$$(26.24)_8 = (2\times8^1)+(6\times8^0)+(2\times8^{-1})+(4\times8^{-2})$$

$$= 16+6+0.25+0.0625$$

$$= (22.3125)_{10}$$ (Ans)

Ans to the Q.NO. 2.

Binary to hexadecimal:

$$(110.010)_2 = \underbrace{0110}_{6}.\underbrace{0100}_{4}$$

$$=(6.4)_{16}$$ Ans

Binary to decimal:

$$(110.010)_2 = (1\times2^2)+(1\times2^1)+(0\times2^0)+(0\times2^{-1})+(1\times2^{-2})+(0\times2^{-3})$$

$$= 4+2+0+0+0.25+0$$

$$= 6+0.25$$

$$=(6.25)_{10}$$ (Ans)

Ans to the Q.NO.3

Division in binary: 111011 ÷ 101

```
         1011.110
101 ) 111011
     -101
      100
      - 0
      1001
     -101
      1000
      -101
        110
       -101
         10
         -0
         10
```

∴ 111011 ÷ 101 = 1011.110

Ans to the Q. No. 4

Obtain 2's complements.

10000101
01111010 → 1's complements.

now,

$$\begin{array}{r} 01111010 \\ +\quad 1 \\ \hline 01111011 \end{array}$$ → 2's complements.

~~Ans~~

Ans to the Q. No. 5

Represent the decimal mambe to (a) BCD (b) excess-3 code

(a) $(6248)_{10}$ → 6 ↓ 0110, 2 ↓ 0010, 4 ↓ 0100, 8 ↓ 1000

∴ $(6248)_{10} = (0110001001001000)_{BCD}$

(b) $(6248)_{10}$ →

6	2	4	8
+3	+3	+3	+3
= 9	= 5	= 7	= 11
↓	↓	↓	↓
1001	0101	0111	1011

∴ $(6248)_{10}$ → $(1001\ 0101\ 0111\ 1011)_{XS-3}$

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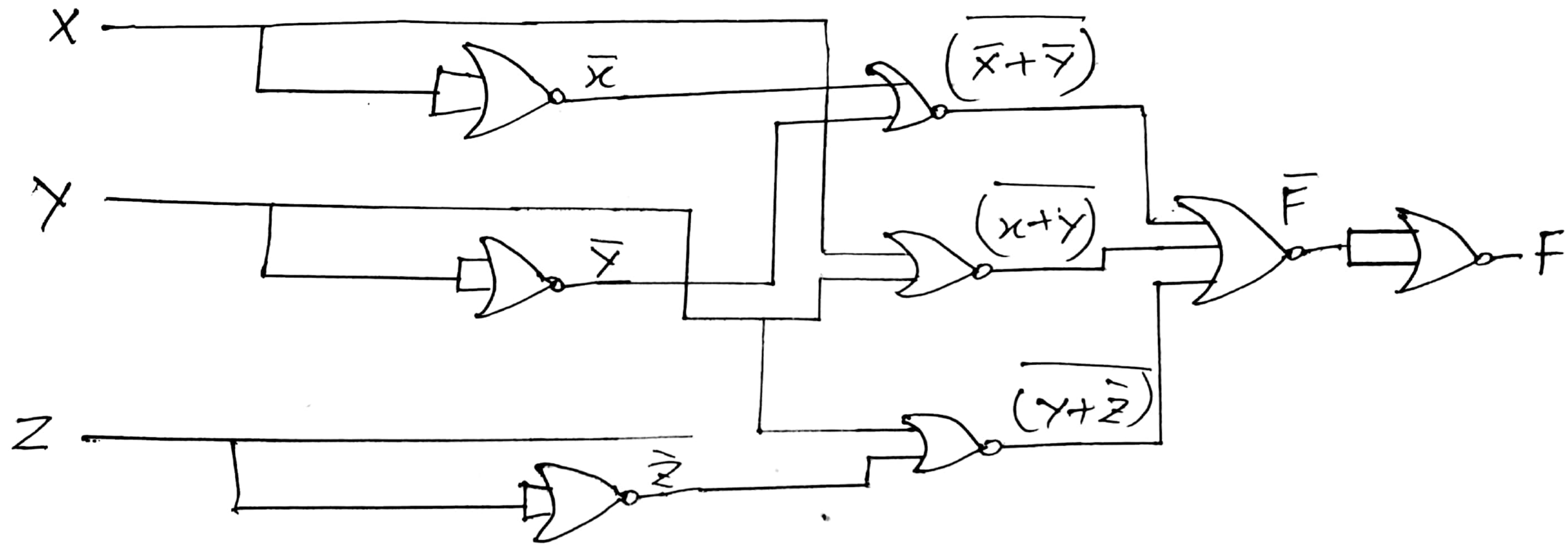
Ans to the Q. No. 6.

Implement the Boolean function with only NOR gate.

$$F = XY + \bar{X}\bar{Y} + \bar{Y}Z$$

$$= \overline{(\bar{X} + \bar{Y})} + \overline{(x + y)} + \overline{(y + \bar{z})}$$



Ans to the Q. NO. 7.

Solution: $F(A,B,C,D) = B'D + A'D + BD$

$= B'D(C+C') + A'D(B+B') + BD(A+A')$

$= B'CD + B'C'D + A'BD + A'B'D + BDA + A'BD$

$= B'CD(A+A') + B'C'D(A+A') + A'BD(C+C')$
$+ A'B'D(C+C') + ABD(C+C') + A'B'D(C+C')$

$= AB'CD + A'B'CD + AB'C'D + A'B'C'D + A'BCD$
$+ A'BC'D + A'B'CD + A'B'C'D + ABCD + ABC'D$
$+ A'BCD + A'BC'D$

AB \ CD	00	01	10	11
00	0	1	0	1
01	0	1	0	1
10	0	1	0	1
11	0	1	0	1

SOP: $f = \Sigma(1, 3, 5, 7, 9, 11, 13, 15)$

POS: $f = \Pi(0, 2, 4, 6, 8, 10, 12, 14)$

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Ans to the Q. No. 8.

~~F(W, X~~ Boolean function

$F(W, X, Y, Z) = \Sigma(1, 3, 7, 11, 15)$

Don't care condition $d(W, X, Y, Z) = \Sigma(0, 2, 5)$

WX \ YZ	00	01	10	11
00	X	1	X	1
01		X		1
10				1
11				1

$\therefore \; F = W'X' + YZ + W'Y'Z$