

NAME : UMAIR KHAN

I.D : 34596

SEMESTER : 4th BS(SE)

SECTION : A

SUBJECT : DIGITAL LOGIC AND DESIGN

INSTRUCTOR : MUHAMMAD AMIN

Q2) CONVERT EACH OF THE FOLLOWING:

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

SOLUTION:

We first take 45

2	45
2	22 - 1
2	11 - 0
2	5 - 1
2	2 - 1
	1 - 0

10110

Now we take .25

$.25 \times 2 = 1$

$.25 \times 2 = 1$

$1 = 1$

Now combining all

10110111

So $(45.25)_{10} = (10110111)_2$

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

SOLUTION:

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

$$= 128 + 0 + 0 + 0 + 0 + 0 + 0 + 0$$

$$= 128$$

Now .1010

$$(1 \times 2^{-3}) + (0 \times 2^{-2}) + (1 \times 2^{-1}) + (0 \times 2^{-0})$$

$$= -8 + 0 + (-2) + 0$$

$$= -8 - 2$$

$$= -10$$

combining

$(128. -10)_{10}$

c) $(3A6F)_{16} = (?)_2$

SOLUTION:

First we will write down the

hexa number

3	A	6	F
3	10	6	15
↓	↓	↓	↓
0011	1010	0110	1111

Q.
i) $198 = (?)_{BCD}$

SOLUTION:

$$\begin{array}{ccc} 1 & 9 & 8 \\ \downarrow & \downarrow & \downarrow \\ 0001 & 1001 & 1000 \end{array}$$

$$198 = (00011001000)_{BCD}$$

j) $11111111_2 = \pm (?)_{10}$

SOLUTION:

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

$$= 128 + 64 + 32 + 16 + 8$$

$$+ 4 + 2 + 1$$

$$= 255$$

$$11111111_2 = \pm (255)_{10}$$

Now read 1's and 0's from left to right to get hexa binary number.

$$(3AF)_{16} = (001110100110111)_2$$

n) $1001010_2 = (?)_{\text{Gray}}$

SOLUTION:

Binary	Gray
0000	0000
0001	0001
0010	0010
0011	0011
0100	0100
Binary =	1001010
Gray =	1100111

$$(1001010)_2 = (1100111)_{\text{Gray}}$$

a) $11000 = (?)_{\text{e.p}}$

SOLUTION:

Even parity

(011000)

Even -

$$0111111_2 = 00000111 \text{ (use 2's complement)}$$

SOLUTION:

$$\begin{array}{r} 1111111 \\ 0000111 \\ \hline 1111000 \end{array}$$

Now add 1 : $1111000 + 1 = 1111001$

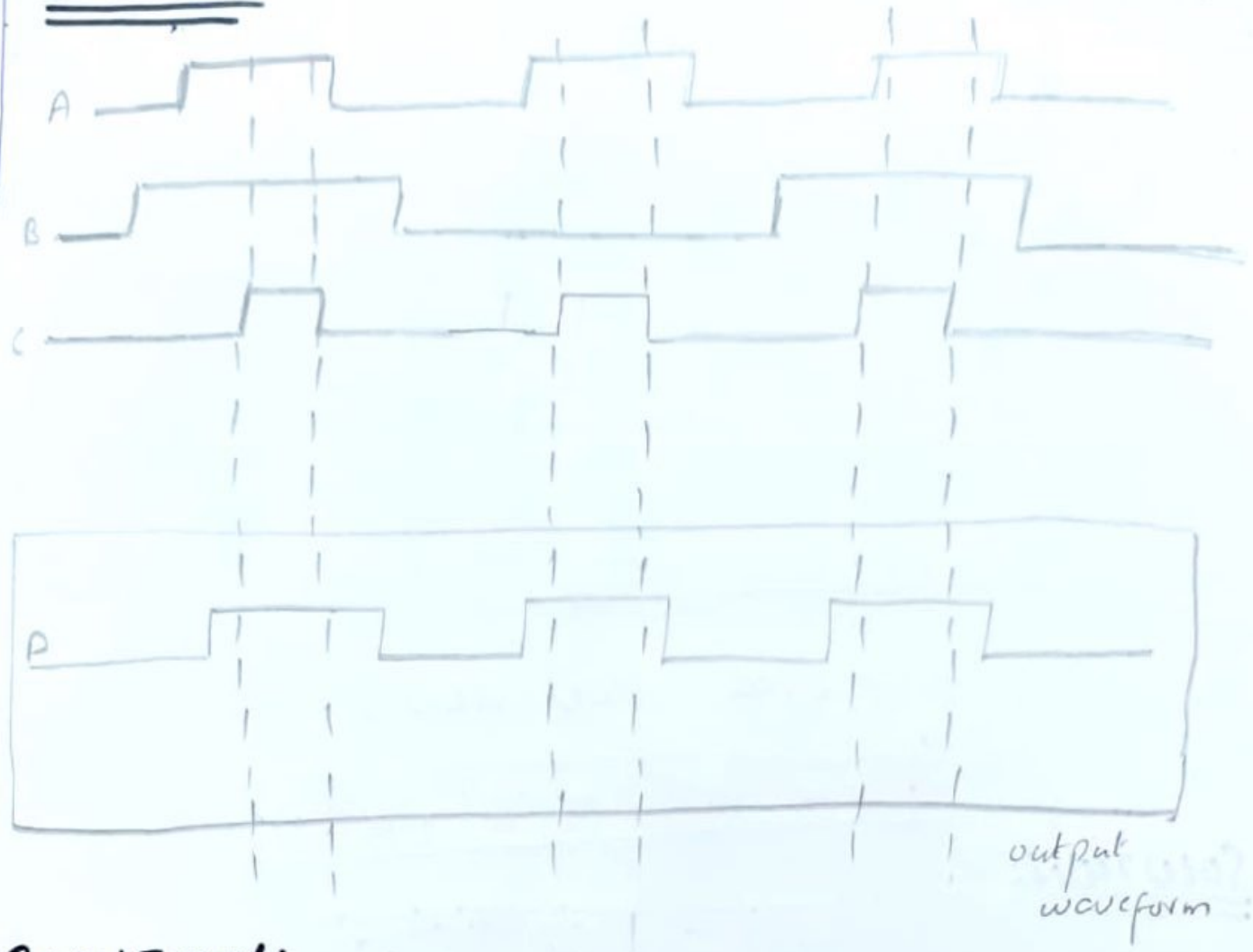
$$\begin{array}{r} 1111111 \\ 0111111 \\ + 1111001 \\ \hline 1011100 \end{array}$$

01111000

Ans
✓



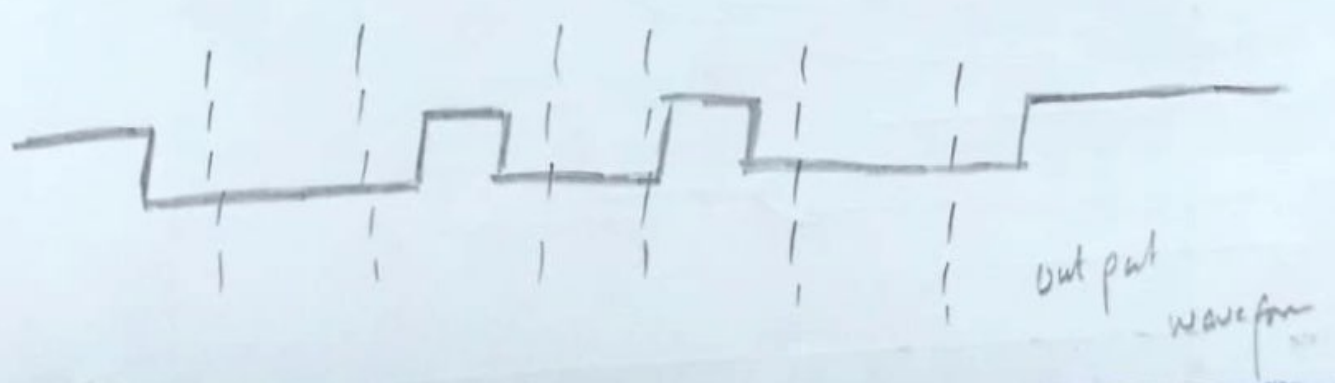
Q 6) SOLUTION:



Q 7) SOLUTION:



Q 8) SOLUTION:



Q 11)

SOLUTION:

$$A\bar{B} + A\bar{B}C + A\bar{B}CD + A\bar{B}CDE$$

$$A\bar{B}(1+c) + A\bar{B}CD(1+E)$$

$$A\bar{B}(1) + A\bar{B}CD(1)$$

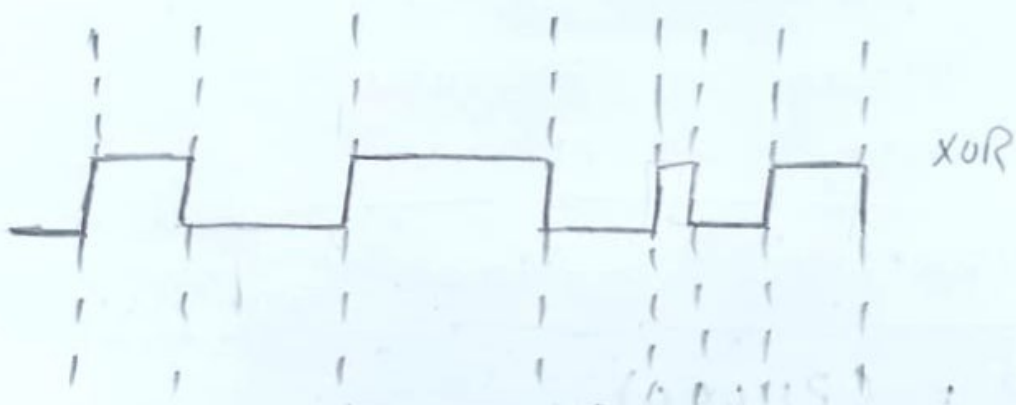
$$A\bar{B}(1 + cD)$$

$$A\bar{B}(1)$$

$$\Rightarrow \boxed{A\bar{B} \text{ Ans}}$$

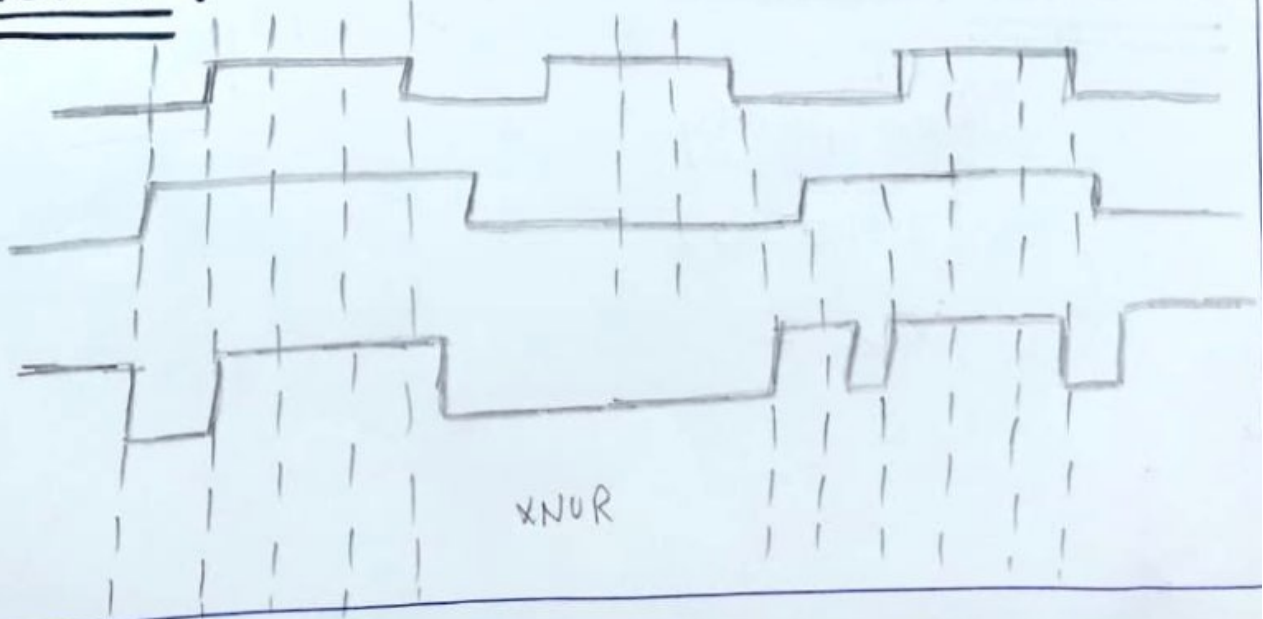
Q 9)

SOLUTION:



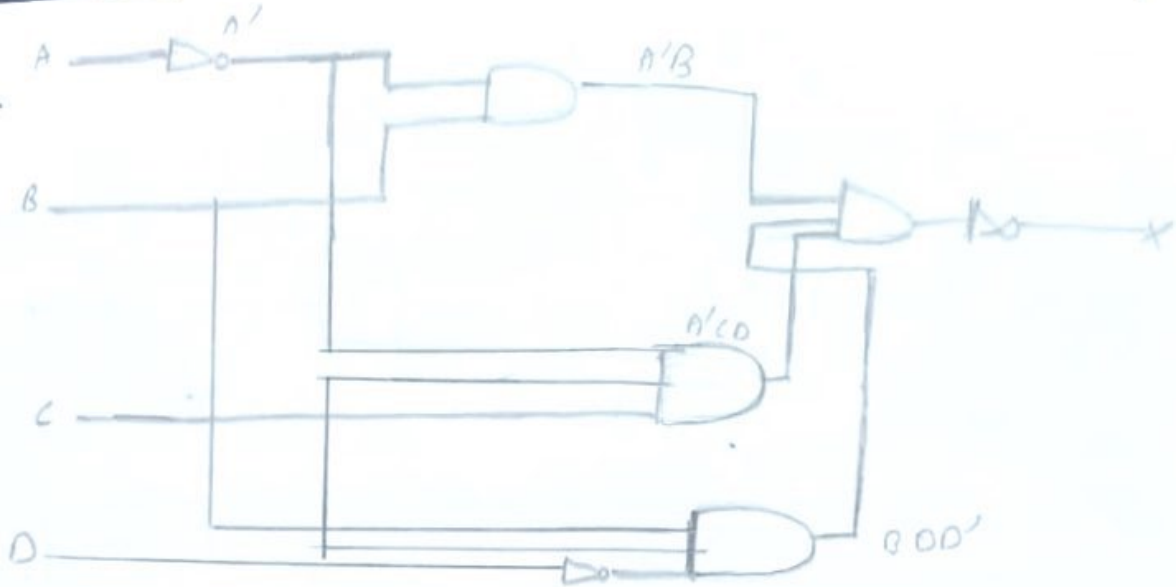
10)

SOLUTION:



Q 17)

SOLUTION:



$$X = (AB' + A'CD + BDD')$$

So

$$X = AB' + A'CD' + B'D'D$$

Q 18)

SOLUTION:

		C	
	0	0	1
	1	0	0
	0	0	1
A	0	1	1
			D

$$X = A + CD + CB' + B$$

