Number System.

Their are four Types of number System.

1. Binary $(\quad)_2$
2. Octal $(\quad)_8$
3. Decimal $(\quad)_{10}$
4. Hexadecimal $(\quad)_{16}$

Binary 0, 1

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

Decimal 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Hexadecimal. 0, 1, 2, 3, 4, 5, 6, 7
8, 9, A, B, C, D, E, F

① Convert Binary to Octal.

$(1011\,0\,1001)_2$ $(551)_8$

Convert Octal to Binary.

$(7\,1\cdot3)_8$ $(011\,100\,01\cdot001)_2$

DATE : / /201

Convert Binary to Octal.

$(10.110)_2$ $(2.6)_8$

(2) Convert Binary to Hexadecimal.

0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

Que. $(0110\ 0001)_2 = (61)_{16}$

Que. $(1000\ 1010 \cdot 1101)_2 = (8A \cdot D)_{16}$

Que. $(0101\ 1101)_2 = (5D)_{16}$

Convert Hexadecimal to Binary.

Que. $(7DF)_{16} = (0111\ 1101\ 1111)_2$

Que. $(22.C)_{16} = (0010\ 0010.1100)_2$

cimal.

(3) Convert Octal to Hexadecimal.

Solve- Octal → Binary → Hexadecimal

Que. $(257)_8$ $(0A7)_{16}$

Firstaly we'll convert Octal to Binary

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

$\therefore (010\ 101\ 111)_2$

Now we'll convert into Hexadecimal

$(0A7)_{16}$ Solved.

Que. $(76.1)_8 = (111\ 110.\ 001)_2$

$(3E.2)_{16}$ Solved.

Convert Hexadecimal to Octal.

Que. $(7A6C)_{16} = (075154)_8$

Solve. firstly we'll convert Hexadecimal to Binary.

$(0111\,1010\,0110\,1100)_2$

Now we'll convert into ~~Hexadecimal~~ Octal.

$(075154)_8$ Solved.

Que. $(6A.2)_{16} = (152.10)_8$

firstly we'll convert Hexadecimal to Binary.

$(0110\,1010.0010)_2$

Now convert into Octal

$(152.10)_8$ Solved.

Convert Decimal to Binary.

Que. $(198)_{10}$ $(11000110)_2$

2	198	
2	99	0
2	49	1
2	24	1
2	12	0
2	6	0
2	3	0
2	1	1
	0	

Que $(179)_{10}$ $(11000111)_2$

2	179	
2	89	1
2	49	1
2	24	1
2	12	0
2	6	0
2	3	0
	1	1

Decimal to Octal.

Que $(798)_{10}$ $(1436)_8$

8	798	
8	99	6 ↑
8	12	3
	1	4

Decimal to Hexadecimal.

Que $(798)_{10}$ $(31E)$

16	798	
16	49	E ↑
	3	1

With point Convert Decimal to Binary.

Que. $(.625)_{10}$ $(.101)_2$.

$.625 \times 2 =$	1.25	1
$.25 \times 2$	0.5	0
$.5 \times 2$	1.0	1 ↓

PAGE No
DATE : / /201

With point Convert Decimal to Octal.

$(.015625)_{10} = (.01)_8$

$.015625 \times 8 = 0.125$ 0
$.125 \times 8 = 1.000$ 1

With point Decimal to Hexadecimal.

$(.93)_{10} = (EE197)_{16}$

$.93 \times 16 = 14.88 = 14$
$.88 \times 16 = 14.08 = 14$
$.08 \times 16 = 1.28 = 1$
$.28 \times 16 = 4.48 = 4$
$.48 \times 16 = 7.68 = 7$

Convert Binary to Decimal.

$(1011)_2 = (11)_{10}$ Ans.

Binary.

1 0 1 1

$1 \times 2^0 = 1$
$1 \times 2^1 = 2$
$0 \times 2^2 = 0$
$1 \times 2^3 = +8$
11

PAGE No
DATE : / /201

Convert Octal to Decimal.

$(106)_8 = (70)_{10}$ Ans.

1 0 6

$6 \times 8^0 = 6$

$0 \times 8^1 = 0$

$1 \times 8^2 = 64$

70

Convert Hexadecimal to Decimal.

$(13A)_{16} = (314)_{10}$

1 3 10

$10 \times 16^0 = 10$

$3 \times 16^1 = 48$

$1 \times 16^2 = 256$

314

With point: Convert Binary to Decimal

$(.101)_2$ $(.625)_{10}$

$.1\ 0\ 1$

$1 \times 2^{-3} = 1/8$

$0 \times 2^{-2} = 0$

$1 \times 2^{-1} = 1/2$

$.625$

Octal to Decimal.

$(.32)_8 = (.40625)_{10}$

$.3\ 2$

$2 \times 8^{-2} = 2/64$

$3 \times 8^{-1} = 3/8$

Hexadecimal to Decimal.

$(.B8)_{16}$ $(.71875)_{10}$

$B\ 8$

$8 \times 16^{-2} = 8/256$

$11 \times 16^{-1} = 11/16$

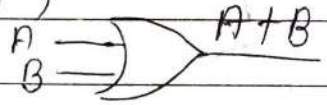
PAGE No
DATE : / / 201

Logic Gate :-

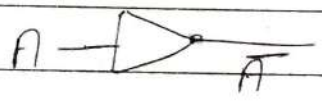
There are three types of Gate.

1. AND Gate (·)

2. OR Gate (+)

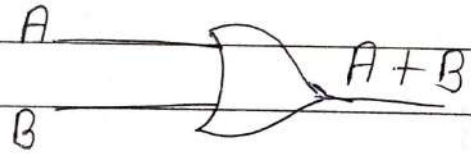


3. NOT Gate. (or −)



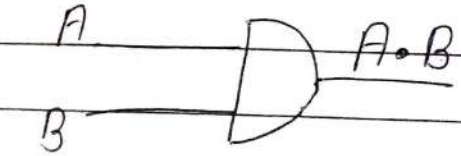
Que.1. Drow the circuit digram of (A+B)

Ans-



Que.2 Drow the circute digram of (A·B)

Ans-

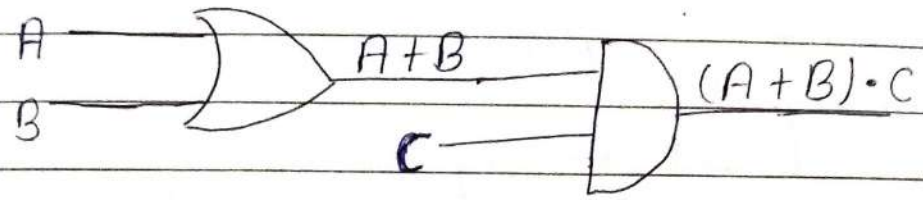


Que3. Drow the circute digram of $\bar{A}$ or A'

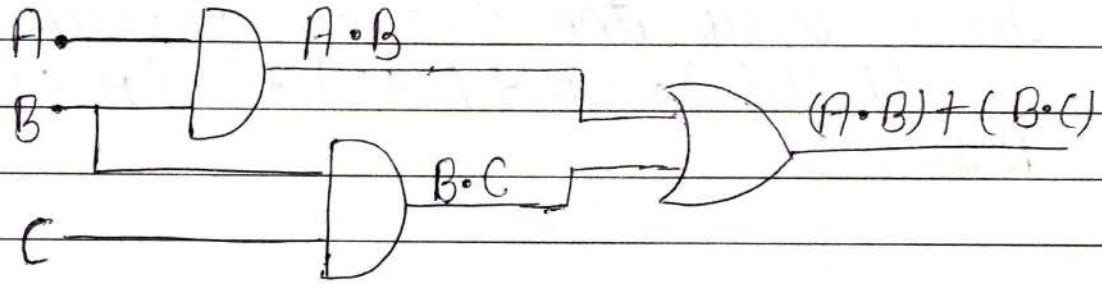
Ans-

Que.4 Drow the circute digram of
$(A+B)\cdot C$

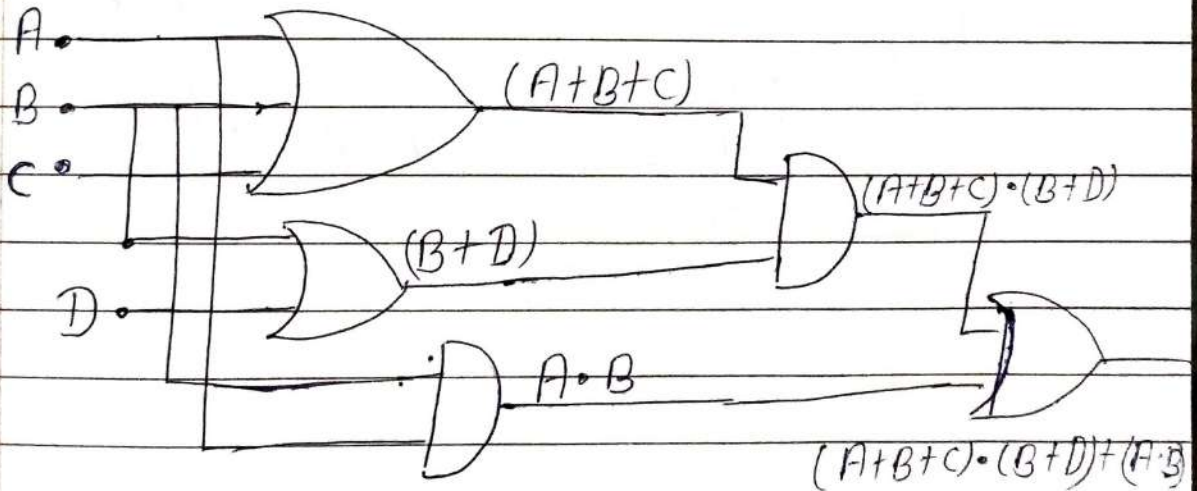
Ans



Que.5 Drow the circute digram of
$(A\cdot B)+(B\cdot C)$

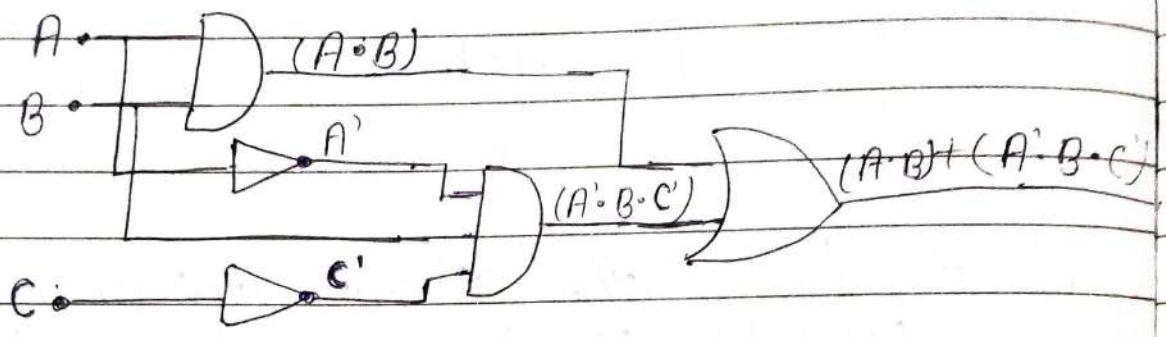


Que.6 Drow the circute digram of
$(A+B+C)\cdot(B+D)+(A\cdot B)$



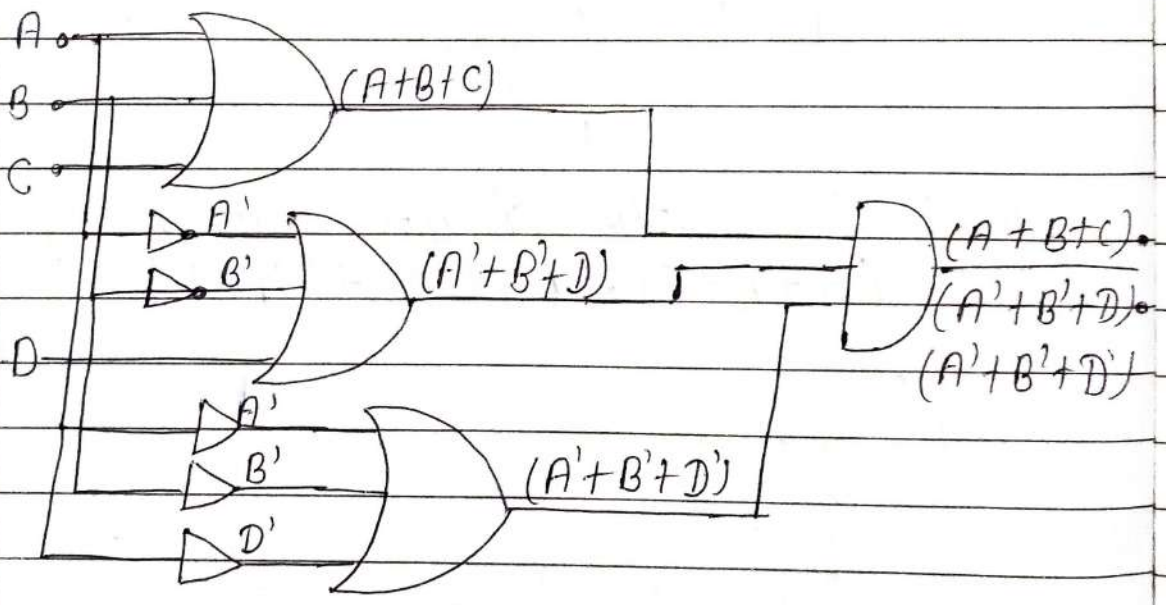
Que. 7 Draw the circute digram of
$(A \cdot B) + (A' \cdot B \cdot C')$

Ans



Que. 8 Draw the circute digram of
$(A+B+C) \cdot (A'+B'+D) \cdot (A'+B'+D')$

Ans



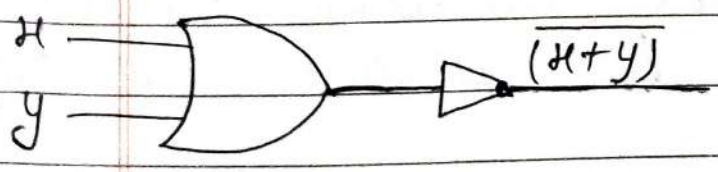
More about logical Gate.

We have convert uit three basic logic Gate NOT, OR, AND So for but their are some more logic Gate also wich are derived from three basic Gate. These Gate are more popular than AND, OR, NOT are widly used. This section introduse NOR, NAND, XOR, XNOR Gates.

NOR Gate :-

The NOR Gate has two or more input signals but only one output Signal.

X	Y	F
0	0	1
0	1	0
1	0	0
1	1	0

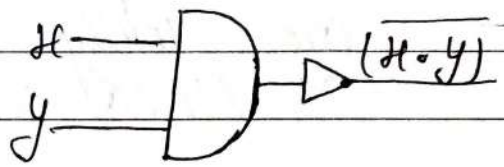


X	Y	Z	F
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
0	1	1	0

NAND Gate :-

NAND Gate have two or more input Signals but only one output Signal if all the inputs are one (high) Then Output produse is 0 (low).

X	y	z	F.
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0



XOR Gate :-

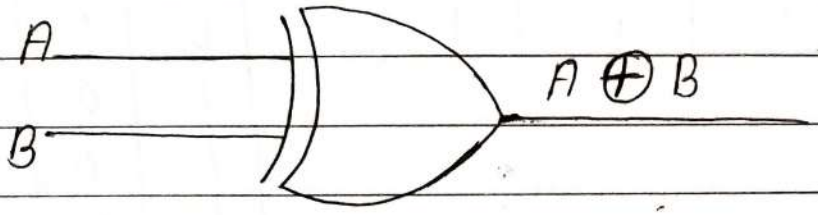
XOR Gate produse Output on for only those input combination that are numbers of n in other word.

The XOR Gate can also two or four input but produse one output Signal.

Exclusive OR defrent from ~~or~~ OR Gat OR Gate produse Output one for any input combination having one

DATE : / /201

or more once. But XOR Gate produse output one for only those input combination that have as numbers of once.



X	Y	F
0	0	0
0	1	1
1	0	1
1	1	0

X	Y	Z	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

XNOR Gate:-

XNOR Gate produse output one for only those input combination that has even number of once. Another word XNOR Gate is logical equabalence two and inverted XOR.

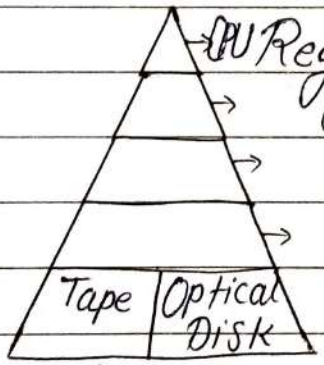
XOR Gate followed by a NOt Gate XNOR gate produse one (high) output when the input Combination as even numbers of once.

III Unit

PAGE No.
DATE : / /201

Memory Hierarchy :-

The memory Hierarchy consist of total memory system of cache from highly slow auxilary memory to a relatively fast memory to cache memory that can be accessible to the high speed proccessing logic five level of memory Drive.



at the top of it hierarchy their is CPU register wich is access at the full CPU speed processing logic.

Their arie local memory to CPU CPU as required this types of memory.

Cache memory wich is currently on the order of 32 kB to few megabite.

Next is main memory with size currently running from 16mB for intrilevel system to few Gegabyte out the other in.
Next is magnetic disk and finaly we have magnetic tape.
The study has we move down hierarchy mainly depend upon 3 key paramiter.

1. Access ctiome
2. Storage Capacity
3. Cost

Access time :-
C.P.U registers are CPU loccal memory and access in few megabites. Cache memory take a small mulitipal of C.P.U register.
main memory access time are critiely few tens of nano seconds now come a big gape as disk access time at leadst 10 m/s second and opticaul disk access maybe masured in seconds.

DATE : / /201

Storage Capacity :-

The storage capacity increase as the go down hierarchy C.P.U registers are good for 128 bytes cache memory are few megabites main memory. are ~~to~~ to 10 to 1000 megabyte. Magnetic disk capacity are few Gegabytes.

Assosiative Memory :-

- A memory unit ~~const~~ accessed by content is called an assosiative memory or content addresable memory. (C.A.M)
- When a word is written on an assosiative memory no address is given the memory is couple of finding a empty location to store the word.
- When a word is to be read from an assosiative memory the content of the word is specify.
- The memory locat ~~at~~ all words wich mach the spacify contant and mark them for reading
- This type of memory access is Simultaneously and the parular on

the basis of data rather than by specific address or location an associative memory is more expensive than a random access memory because each cell must have storage capacity as well as logic circuit for matching its content with an external argument.

- The associative memory are used in application where the searching time is must very fast.

DATE : / /201

Memory Organisation :-

An electronic cercuit that allow data do be store and retry. when required. It process is called memory.

Memory unit that comunicate directly with the CPU this is known as main memory. The storage that provide backup storage is called as auxiliary memory It storage the set of instruction Program, data and intermedient of the computation.

Main Memory :-

The memory unit that comunicate directly with the CPU is called main memory. It is ~~relatily redact~~ relaitedly large and fast memory. besicly use for store program and data daing computer operation The main memory can be classificle into two categoriese.

1. Ram
2. Rom

Ram :-

It is use to read and write User can write information into ram and read information from it. It is bodatile in nadure the information written in it.

Their aire two type of Ram.

1. Static Ram
2. Dinamic Ram

Static Ram :-

The Static ram consist of internal flipflops that stores the binary information

Dinamic Ram :-

The Dinamic ram store information in the form of the electric charges that aire applide to capaciter. The capaciters aire prouide inside the ram chip. by the instruction.

PAGE NO
DATE : / /201

Rom :-

Rom Stand for read only memory It is nonvolatile. Information stored in it is not lost even if the power suply goes off.
It is use for parmanently storage of information.
The stored information can only read from rom as the time of operation and nothing can be written into rom by user.

Defrent Types of Rom :-

PROM :- Programable read only memory
EROM :- Earesiable read only memory
EEPROM :- Electronicaully erasible only memory.