MIDTERM EXAMINATION
Fall 2009
CS302- Digital Logic Design

Question No: 1 (Marks: 1) - Please choose one

According to Demorgan's theorem:

$\overline{A+B+C}$ =

- ► $A.B.\overline{C}$
- ► $A+\overline{B.C}$
- ► $\overline{A}.\overline{B}.\overline{C}$
- ► $\overline{A.B}+C$

Question No: 2 (Marks: 1) - Please choose one

The Extended ASCII Code (American Standard Code for Information Interchange) is a _____ code

- ► 2-bit
- ► 7-bit
- ► **8-bit**
- ► 16-bit

Question No: 3 (Marks: 1) - Please choose one

The AND Gate performs a logical _____function

► Addition
► Subtraction
►**Multiplication**
► Division

Question No: 4 (Marks: 1) - Please choose one

NOR gate is formed by connecting _____

►**ORGateandthenNOTGate**
► NOT Gate and then OR Gate
► AND Gate and then OR Gate
► OR Gate and then AND Gate

Question No: 5 (Marks: 1) - Please choose one

Generally, the Power dissipation of _____ devices remains constant throughout their operation.

►**TTL**
► CMOS 3.5 series
► CMOS 5 Series
► Power dissipation of all circuits increases with time

Question No: 6 (Marks: 1) - Please choose one

Two 2-bit comparator circuits can be connected to form single 4-bit comparator

► **True**
► False

Question No: 7 (Marks: 1) - Please choose one

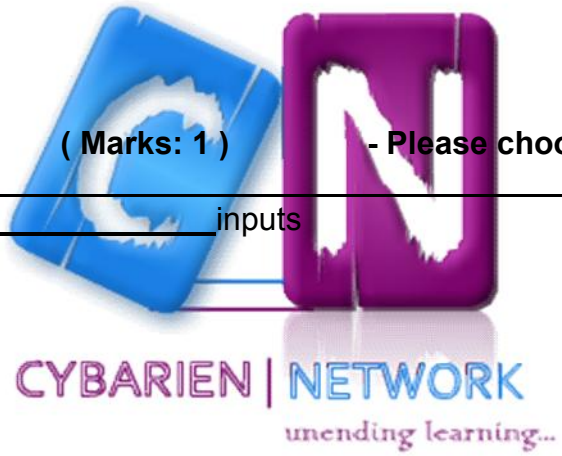
When the control line in tri-state buffer is high the

buffer operates like a _____ gate

► AND
► OR
► NOT
► **XOR**

Question No: 8 (Marks: 1) - Please choose one

The GAL22V10 has _____inputs



► 22
► **10**
► 44
► 20

Question No: 9 (Marks: 1) - Please choose one

The ABEL symbol for “OR” operation is

► !
►**&**
► #
► $

Question No: 10 (Marks: 1) - Please choose one

The OLMC of the GAL16V8 is _____ to the OLMC of the GAL22V10

► Similar
► Different
►**Similarwithsomeenhancements**
► Depends on the type of PALs input size

Question No: 11 (Marks: 1) - Please choose one

All the ABEL equations must end with _____

► " . " (a dot)
► " $ " (a dollar symbol)
►**";" (asemicolon)**
► " endl " (keyword "endl")

Question No: 12 (Marks: 1) - Please choose one

The Quad Multiplexer has _____outputs

►**4**
► 8
► 12
► 16

Question No: 13 (Marks: 1) - Please choose one

"Sum-of-Weights" method is used _____

► **to convert from one number system to other**
► to encode data
► to decode data
► to convert from serial to parralel data

Question No: 14 (Marks: 1) - Please choose one

Circuits having a bubble at their outputs are considered to have an active-low output.

► **True**
► False

Question No: 15 (Marks: 1) - Please choose one

(A B)(A $\overline{B}$ C)(A $\overline{C}$) is an example of _____

► **Productofsumform**
► Sum of product form
► Demorgans law
► Associative law

Question No: 16 (Marks: 1) - Please choose one

Which one is true:

► **Power consumption of TTL is higher than of CMOS**

► Power consumption of CMOS is higher than of TTL

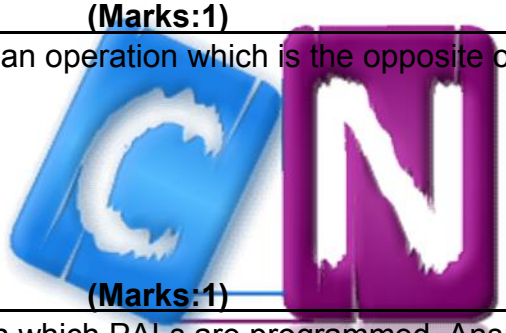
► Both TTL and CMOS have same power Consumption

► Power consumption of both CMOS and TTL depends on no. of gates in the circuit.

QuestionNo:17 (Marks:1)

Which device performs an operation which is the opposite of the Decoder function?

Ans:
Encoderfunction.



QuestionNo:18 (Marks:1)

Name any two modes in which PALs are programmed. Ans:

PAL devices are programmed by blowing the fuses permanently using over voltage.

QuestionNo:19 (Marks:2)

Explain Combinational Function Devices?

Ans;
Xor,Xnor,NAND,NOR are combinational function devices.

QuestionNo:20 (Marks:3)

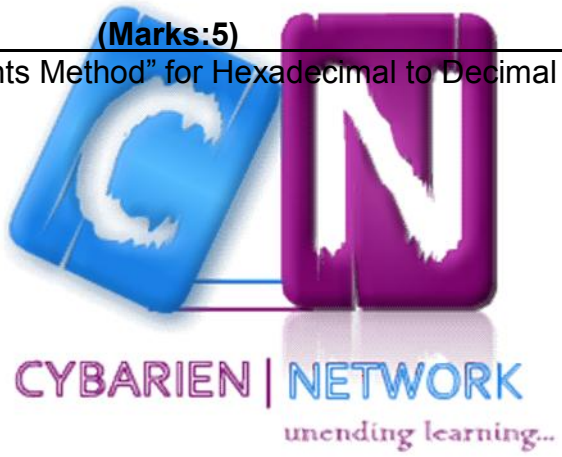
Differentiate between hexadecimal and octal number system

octal - base 8 hexadecimal - base 16
Octal and hex are used to represent numbers instead of decimal because there is a very easy and direct way to convert from the "real" way that computers store numbers (binary) to something easier for humans to handle (fewer symbols)**. To translate a binary number to octal, simply group the binary digits three at a time and convert each group. For hex, group the binary digits four at a time.**

QuestionNo:21 (Marks:5)

Explain “Sum-of-Weights Method” for Hexadecimal to Decimal Conversion with at least one example ?

Ans:



The **hexadecimal (Hex) numbering system provides even shorter notation than octal. Hexadecimal uses a base of 16. It employs 16 digits: number 0 through 9, and letters A through F, with A through F substituted for numbers 10 to 15, respectively,**

Hexadecimal numbers can be expressed as their decimal equivalents by using the sum of weights method, as shown in the following example:

Weight	**2**	**1**	**0**	
Hex. Number		**1**	**B**	**7**
				7 x 16^0 = 7 x 1 = **7**
176				**11 x 16^1 = 11x 16 =**
256				**1 x 16^2 = 1 x 256 = Sum**

43910 **of products**

Like octal numbers, hexadecimal numbers can easily be converted to binary or vise versa. Conversion is accomplished by writing the 4-bit binary equivalent of the hex digit for each position, as illustrated in the following example:

Hex. Number 1 B 7

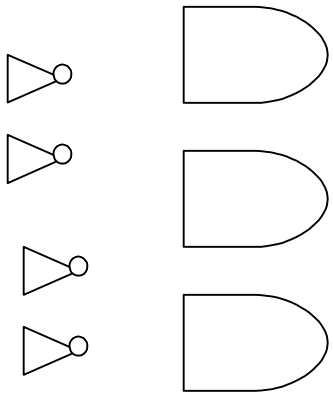
0001 1011 0111 Binary number

Hexadecim al	Binary	Decimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
A	1010	10
B	1011	11
C	1100	12
D	1101	13
E	1110	14
F	1111	15

QuestionNo:22 (Marks:10)

Draw the function table of two-bit comparator circuit, map it to K-Map and derive the
expression for (A > B) Ans:

X_1	X_0	Y_1	Y_0	X<Y	X=Y	X>Y
0	0	0	0	0	1	0
0	0	0	1	1	0	0
0	0	1	0	1	0	0
0	0	1	1	1	0	0
0	1	0	0	0	0	1
0	1	0	1	0	1	0
0	1	1	0	1	0	0
0	1	1	1	1	0	0
1	0	0	0	0	0	1
1	0	0	1	0	0	1
1	0	1	0	0	1	0
1	0	1	1	1	0	0
1	1	0	0	0	0	1
1	1	0	1	0	0	1
1	1	1	0	0	0	1
1	1	1	1	0	1	0



The circuit has inputs X_1X_0 and Y_1Y_0 and outputs X > Y,

the expression for > is

$X_1\overline{Y_1} \quad X_0\overline{Y_1}\,\overline{Y_0} \quad X_1X_0\overline{Y_0}$

time is out……