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>> **Name of Student -** _____

>> **Enrollment No -** _____

>> **Subject -** Digital Electronics Lab

>> **Subject code -** BTCE205

>> **Batch -** _____

>> **Division -** _____

>> **Dept /Branch / Program -** _____

>> **School -** School of Technology, GSFC University, Vadodara

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Sr.No	Name of Experiment	Date	Sign	Remarks

Experiment - 1

Aim - Study of Digital Number System & Its Significance

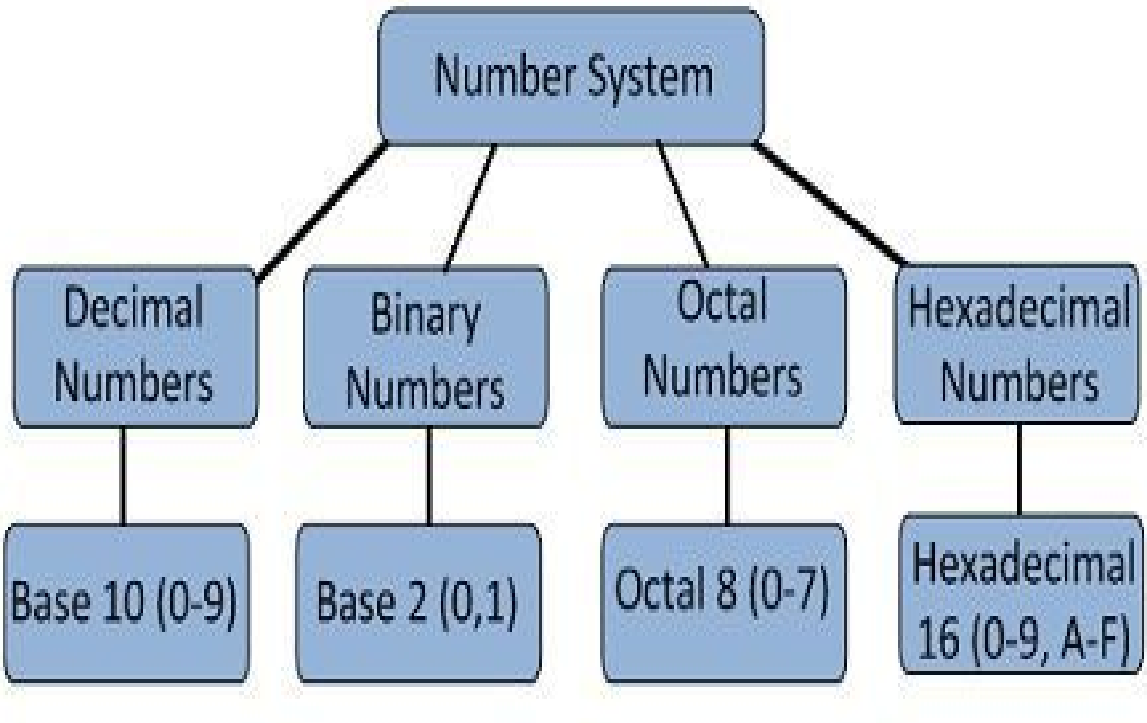
Theory -

Definition: In digital electronics, the number system is used for representing the information. The number system has different bases and the most common of them are the decimal, binary, octal, and hexadecimal. The base or radix of the number system is the total number of the digit used in the number system. Suppose if the number system representing the digit from 0 – 9 then the base of the system is the 10.

Types of Number Systems

Some of the important types of number system are

1. Decimal Number System
2. Binary Number System
3. Octal Number System
4. Hexadecimal Number System



1. Decimal Number Systems

The number system has digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9; this number system is known as a decimal number system because a total ten digits are involved.The base of the decimal number system is 10.

2. Binary Number Systems

The modern computers do not process decimal number; they work with another number system known as a binary number system which uses only two digits 0 and 1.The base of binary number system is 2 because it has only two digit 0 and 1.The digital electronic equipments are works on the binary number system and hence the decimal number system is converted into binary system. The table is shown below the decimal, binary, octal, and hexadecimal numbers from 0 to 15 and their equivalent binary number.

3. Octal Numbers

The base of a number system is equal to the number of digits used, i.e., for a decimal number system the base is ten while for the binary system the base is two. The octal system has the base of eight as it uses eight digits 0, 1, 2, 3, 4, 5, 6, 7.
All these digits from 0 to 7 have the same physical meaning as by decimal symbols, the next digit in the octal number is represented by 10, 11, 12, which are equivalent to decimal digits 8, 9, 10 respectively. In this way, the octal number 20 will represent the decimal digit and subsequently, 21, 22, 23.. Octal numbers will represent the decimal number digit 17, 18, 19… etc. and so on.

4. Hexadecimal Numbers

These numbers are used extensively in microprocessor work.The hexadecimal number system has a base of 16, and hence it consists of the following sixteen number of digits.
0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.
The size of the hexadecimal is much shorter than the binary number which makes them easy to write and remember. Let 0000 to 000F represent hexadecimal numbers from zero to fifteen, then 0010, 0011, 0012, …etc. Will represent sixteen, seventeen, eighteen… etc. till 001F which represent thirty open and so on.

Conversion Table

Decimal	Binary	Octal	Hexadecimal
0	0000	000	0000
1	0001	001	0001
2	0010	002	0002
3	0011	003	0003
4	0100	004	0004
5	0101	005	0005
6	0110	006	0006
7	0111	007	0007
8	1000	010	0008
9	1001	011	0009

Task -

Birth Date - DD - MM - YYYY < _ _ - _ _ - _ _ _ _ >

Convert Your Birth date in following

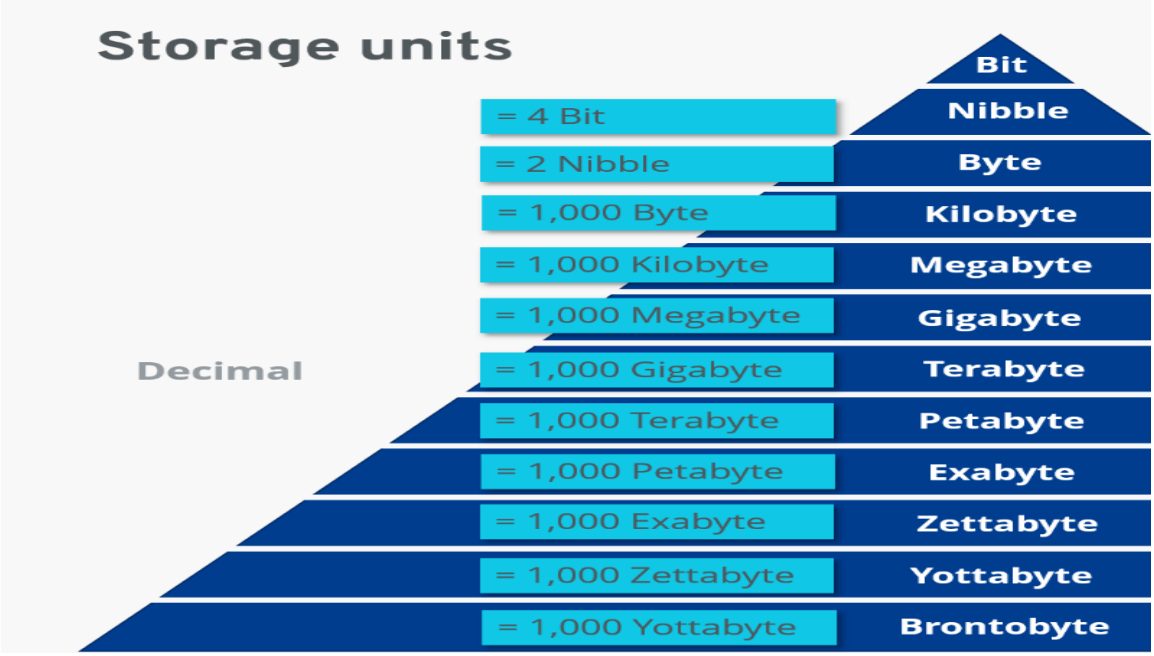
Binary _____

Octal _____

Hexa _____

ASCII stands for **American Standard Code for Information Interchange**. It is an encoding standard that represents digits, letters, and symbols using numbers. The digits can be 1, 2, 3, etc. while the letters are a, b, c, A, B, C, etc. The symbols are characters like !, $, and #. Therefore, it is possible to convert any piece of text to the corresponding set of numbers using ASCII. This conversion makes it easier to store them in the computer memory.

EBCDIC stands for **Extended Binary Coded Decimal Interchange Code**. It is mainly used on IBM mainframe and IBM midrange computer operating systems. It is also supported by some platforms other than IBM. EBCDIC uses 8 bits to represent a single character, and it represents a 256 (2_8) alphanumeric and special characters.



Birth Date (Data) _____ (bytes)

Conclusion -

_____

_____

_____

_____

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