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Number System: 2-1 (9)

Decimal number System :-
We are familiar with the decimal number System with its ten digits : 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. In this system when we write a number greater than (9) we combine the decimal digits and get the desired number.

Binary Number System :- It is a two valued System developed by George Boole. Two digits 0 and 1 called bits are used in binary System. A number of decimal System can be converted into binary by the successive division of 2 until a quotient is zero. The remainder obtained in the successive divisions taken in the reverse order give to binary representation of that number.

For example :-

Decimal number	Binary number
0	0
1	1
2	10
3	11
4	100
5	101

Decimal no.	binary no.
6	110
7	111
8	10000
9	1001

Binary representation of 27.

2	27	R
2	13	1
2	6	1
2	3	0
2	1	1
.	0	1

The remainders in reverse order are 11011

$$\therefore (27)_{10} = (11011)_2$$

In binary representation of any number the first bit is the most significant bit (MSB) and the last bit is the least significant bit (LSB). Similarly, a decimal number can be obtained from a binary number by adding all the products multiplication of bits and 2 increases by a factor of 2 for each bit from MSB to LSB

Example :- $(11011)_2 = 1 \times (2)^0 + 1 \times (2)^1 + 0 \times (2)^2 + 1 \times (2)^3 + 1 \times (2)^4$

$= 1 + 2 + 0 + 8 + 16 = (27)_{10}$