

# Number system

# TYPES OF NUMBER SYSTEM

- 1. NON POSITIONAL NUMBER SYSTEMS
- 2. POSITIONAL NUMBER SYSTEMS

# nonpositional number system

- each symbol represents same value regardless of its position in number
- TO FIND THE VALUE one has to count the symbols present in the number

- NON-POSITIONAL NUMBERSYSTEM HAVE SYMBOLS SUCH AS *roman numbers*
- 1-2
- II-2
- III-3
- IV-4

# In **POSITIONAL** number system

- Only few symbols called digits
- These symbols represent different values
- These values depending on the position they occupy in number

- To determine the value of each digit
- 1.the digit it self
- The position of the digit in the number
- The base of the number system

# Base of a number system

Total number of digits available in the number system is called base of that number system

# DECIMAL NUMBER

- In our daily life we use decimal number system
- It has base ten
- Because there are 10 different symbols(0,1,2,3,4,5,6,7,8,9 ) in this system to represent any number.



- EXAMPLE-
- Decimal number 2586 represent as

$$(2 \times 10^3) + (5 \times 10^2) + (8 \times 10^1) + (6 \times 10^0) = 2586_{10}$$

# Binary number system

- It like decimal number system
- Except that the base is 2
- We can use only two symbols(0,1) to represent  
Any number

# Octal number system

- There are only eight symbols in this number system
- 0,1,2,3,4,5,6,7
- The largest single digit is 7.

# Hexadecimal number system

- The base is 16 in this number system
- First 10 digits are same digits of decimal number system(0,1,2,3,4,5,6,7,8,9)
- The remaining six digit denoted by symbols A,B,C,D,E,F represent decimal value 10,11,12,13,14,15 respectively.

# Relationship among decimal, hexadecimal, binary and octal numbersystems

decimal	hexadecimal	binary	octal
0	0	0	0
1	1	1	1
2	2	10	2
3	3	11	3
4	4	100	4
5	5	101	5
6	6	110	6
7	7	111	7
8	8	1000	10
9	9	1001	11
10	A	1010	12
11	B	1011	13
12	C	1100	14
13	D	1101	15
14	E	1110	16
15	F	1111	17
16	10	10000	20