What is number system?

A number system is a system of writing for expressing numbers. It is the mathematical notation for representing numbers of a given set by using digits or other symbols in a consistent manner. It provides a unique representation to every number and represents the arithmetic and algebraic structure of the figures. It also allows us to operate arithmetic operations like addition, subtraction, and division.

Different number systems are mentioned below.

1. Decimal number system (Base- 10)
2. Binary number system (Base- 2)
3. Octal number system (Base-8)
4. Hexadecimal number system (Base- 16)

Computer numeral system

When we type any letter or word, the computer translates them into numbers since computers can understand only numbers. A computer can understand only a few symbols called digits, and these symbols describe different values depending on the position they hold in the number.

The value of any digit in a number can be determined by

-The digit

-Its position in the number

-The base of the number system

Decimal Number System

Decimal number system has base 10 because it uses ten digits from 0 to 9. In decimal number system, the positions successive to the left of the decimal point represent units, tens, hundreds, thousands and so on.

Every position shows a particular power of the base (10). For example, the decimal number 1457 consists of the digit 7 in the units position, 5 in the tens place, 4 in the hundreds position, and 1 in the thousands place whose value can be written as

$(1×1000) + (4×100) + (5×10) + (7×1)$

$(1×10^3) + (4×10^2) + (5×10^1) + (7×1)$

$1000 + 400 + 50 + 7$

1457

Base 2 Number System

Base 2 number systems are also known as Binary number system wherein, only two binary digits exist, i.e., 0 and 1. Specifically, the usual base-2 is a radix of 2. The figures described under this system are known as binary numbers which are the combination of 0 and 1. For example, 110101 is a binary number.

We can convert any system into binary and vice versa.

For Example, to write $(14)_{10}$ as binary number

Solution:

$(14)_{10} = 1110_2$

Base 10 Number System

This system is expressed in decimal numbers. The base to the decimal is 10. This shows that there are ten symbols, 0 to 9. Similarly, the system using the symbols 0, 1, two will be of base 3, four symbols will be of base 4 and so on.