

Number System

Represent a number using different forms using different base value.

- Decimal number System

base value - 10 - digit place

Representation :- 0-9 digits and powers of 10.

$$\text{Ex - } 520 = 5 \times 10^2 + 2 \times 10^1 + 0 \times 10^0$$

- Binary number System

base value - 2

Representation :- 0, 1 digits, powers of 2.

If subscript = 2, no is binary.

$$1010_2 = 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$$

* The subscript represents the base of different no system.

Hexadecimal \rightarrow base value = 16

Representation: 0-15, powers of 16

$$4ASC_{16} = 4 \times 16^3 + 10 \times 16^2 + 5 \times 16^1 + 12 \times 16^0$$

10 - A

11 - B

12 - C

13 - D

14 - E

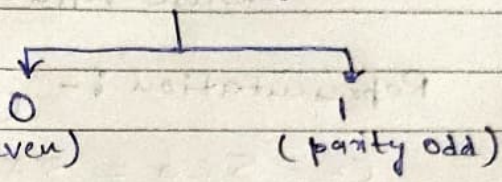
15 - F

Conversion of Binary to Decimal

$$\begin{aligned}
 101_2 &= 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\
 &= 4 + 0 + 1 \\
 &= 5_{10}
 \end{aligned}$$

Conversion of Decimal to Binary

Parity digit - $n_2 \rightarrow$ remainders



Parity digit	No (decimal form)
	remainders

Ex -

0	14
0	7
1	3
1	1
0	0

(parity digit) remainder	No (decimal form) Quotient

0	14
1	7
1	3
1	1
0	0

$$\begin{aligned}
 1110_2 &= 14 \\
 \text{(Binary)} &\quad \text{(Decimal)}
 \end{aligned}$$