

### 8) conversion of binary number in to decimal numbers

#### 1) 00111

Ans-

$$\begin{aligned}00111_2 &= (0 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) \\ &= 0 + 0 + 4 + 2 + 1 = 7_{10}\end{aligned}$$

#### 2) 11001

$$\begin{aligned}\text{And - } (11001)_2 &= (1 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) \\ &= 16 + 8 + 0 + 0 + 1 \\ (11001)_2 &= 16 + 8 + 0 + 0 + 1 \\ (11001)_2 &= 25_{10}\end{aligned}$$

#### 3) 1010.001

$$\begin{aligned}\text{And - } (1010.001)_2 &= (1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) + (0 \times 2^{-1}) + (0 \times 2^{-2}) + (1 \times 2^{-3}) \\ &= 8 + 0 + 2 + 0 + 0 + 0 + 0.125 + 0 \\ &= (10.125)_{10}\end{aligned}$$

#### 4) 111.11

$$\begin{aligned}\text{Ans- } (111.11)_2 &= (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) + (1 \times 2^{-1}) + (1 \times 2^{-2}) \\ &= 4 + 2 + 1 + 0.5 + 0.25 \\ &= 7.75_{10}\end{aligned}$$

### Q9) conversion of hexadecimal number into binary number

#### 1) ABC

$$\begin{aligned}\text{ans- } abc_{16} &= 10 \times 16^2 + 11 \times 16^1 + 12 \times 16^0 \\ &= 2560 + 176 + 12 \\ &= 2748_{10}\end{aligned}$$

$$2748_{10} = 1010101111002$$

$$\text{Hence } ABC_{16} = 1010101111002$$

**2) CD42<sub>16</sub>**

**Ans:**  $CD42_{16} = 12 \times 16^3 + 13 \times 16^2 + 4 \times 16^1 + 2 \times 16^0$

$$= 49152 + 8328 + 64 + 2$$

$$= 52546_{16}$$

$$52546_{10} = 1100110101000010_2$$

$$CD42_{16} = 1100110101000010_2$$

**3) F329**

**Ans:**  $f329 = 15 \times 16^3 + 3 \times 16^2 + 2 \times 16^1 + 9 \times 16^0$

$$= 61440 + 768 + 32 + 9$$

$$= 62249_{10}$$

$$62249_{10} = 11110011001010012$$

$$F329 = 11110011001010012$$

**Q10) conversion following binary number into hexadecimal number**

**1) 11101000**

**Ans :**  $11101000 = (1 \times 2^7 + 1 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0)$

$$= 128 + 64 + 32 + 0 + 8 + 0 + 0 + 0$$

$$= 232_{10}$$

$$11101000 = 232_{10}$$

$$232_{10} = E_{16}$$

$$11101000 = E_{16}$$

**2) 10101110110**

**Ans :**  $10101110110 = 1 \times 2^{10} + 0 \times 2^9 + 1 \times 2^8 + 0 \times 2^7 + 1 \times 2^6 + 1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$

$$= 1024 + 0 + 256 + 0 + 64 + 32 + 16 + 0 + 4 + 2 + 0$$

$$= 1398_{10}$$

$$1398_{10} = 576_{16}$$

$$10101110110 = 576_{16}$$

**3)11001011**

$$\text{Ans : } 11001011 = 1 \times 2^7 + 1 \times 2^6 + 0 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$$

$$= 128 + 64 + 0 + 0 + 8 + 0 + 2 + 1$$

$$= 203_{10}$$

$$203_{10} = \text{CB}_{16}$$

**4) 1000101111010110<sub>2</sub>**

$$\text{Ans : } 1000101111010110_2 =$$

$$1 \times 2^{15} + 0 \times 2^{14} + 0 \times 2^{13} + 0 \times 2^{12} + 1 \times 2^{11} + 0 \times 2^{10} + 1 \times 2^9 + 1 \times 2^8 + 1 \times 2^7 + 1 \times 2^6 + 0 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$$

$$= 32768 + 0 + 0 + 0 + 2048 + 0 + 515 + 256 + 128 + 64 + 0 + 16 + 0 + 4 + 2 + 0$$

$$= 35798_{10}$$

$$35798_{10} = 8BD6_{16}$$

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