



CLASS NOTES-ANSWERS

Assess Yourself

4) Think and answer.

a) What is an octal number system?

Answer: A number system made up of eight digits from 0 to 7, is known as the octal number system. In octal number system, every number is formed using the digits 0,1,2,3,4,5,6 and 7. The base of the octal number system is 8. It is also known as the base-8 system. Each positioning number represents the power of base 8.

b) What do you understand by the number system? Give an example.

Answer: A number system is a way to express quantities used for counting, comparing amounts, performing calculations and representing values.

c) What do you mean by base in a number system?

Answer: The total number of digits used in a number system is called its base or radix.

d) How do you represent data on a computer?

Answer: The smallest piece of data that can be recognised and used by the computer is known as the bit or binary digit. A bit is a single binary value i.e., 1 or 0. A computer is an electronic device which has two states: On and Off. These two states of the computer are represented by two digits: 1 and 0. 1 represents the electronic state ON, and 0 represents the electronic state OFF.



e) How can we convert a binary number into a decimal number? Give an example.

Answer: To convert a binary number into a decimal number, follow the given steps:

1. Multiply each digit of the binary number by 2 to the power of n, where n is the position of the digit starting from 0 on the right.
2. Add the result.

Example:

Convert $(101001)_2$ to decimal number.

$$= (1 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$$

$$\text{Sum of the products} = 32 + 0 + 8 + 0 + 0 + 1 = (41)_{10}$$

$$\text{Hence, } (101001)_2 = (41)_{10}$$

f) Write the rules to subtract two binary numbers

Answer:

X	Y	X-Y
0	0	$0 - 0 = 0$
0	1	$0 - 1 = 1$ (borrow 1, so that $10 - 1 = 1$)
1	0	$1 - 0 = 1$
1	1	$1 - 1 = 0$

5) Solve the following:

a) Convert these into the given number system and write their results.



- i) $(101)_2$ to decimal number system - 5
- ii) $(250)_{10}$ to binary number system - $(11111010)_2$
- iii) 101011_2 to decimal number system - $(43)_{10}$
- iv) 10111011_2 to Decimal number system - $(187)_{10}$

b) Perform the following operations on binary numbers.

- i) Subtract $(1101)_2$ from $(100110)_2$ - $(011001)_2$
- ii) Add $(1000)_2$ and $(101)_2$ - $(01101)_2$

6) Competency-based/Application-based questions:

a) Kartik noticed the following numbers while working. $(256)_8$ and $(2AF)_{16}$.

Which number system do they belong to? How can he tell?

Answer: $(256)_8$ → This number belongs to octal number system.

$(2AF)_{16}$ → This number belongs to hexadecimal number system.

He can tell by observing the base of the number system

b) A number system has made the representation of large values easy. It is made up of 16 symbols, 0 to 9 and A to F. Which number system we are talking about?

Answer: We are talking about hexadecimal number system.

{Coding zone}

1) Write the largest and smallest six-digit numbers having four different digits.

Answer: 99876 and 100023

2) If $35 \# 5 = 7$ and $49 \# 7 = 7$, then $125 \# 5 = ?$

Answer: 25