Chapter-1st
Number System

A. Objective Type Questions:

1. Which of the following is the smallest number in the hexadecimal system?
   a) 0 b) 1 c) A d) F
2. What is the binary equivalent of the decimal number 15?
   a) 0111 b) 1111 c) 0101 d) 0011
3. Which number system is most commonly used in everyday arithmetic?
   a) Binary b) Decimal c) Hexadecimal d) Octal
4. Radix of hexadecimal numbers System is
   a) 2 b) 5 c) 8 d) 16
5. $(38CB)_{16}$ is an example of which number system is?
   a) Binary b) Decimal c) Hexadecimal d) Octal

Ans: 1) a) 0 2) b) 1111 3) b) Decimal 4) d) 16 5) c) Hexadecimal

B. Write True or False for the following Statements:

1. The Binary Number 1111 represents the decimal number 15.
2. The hexadecimal system uses 2 as its base/radix.
3. Octal word comes from Latin word Oct which means 8.
4. The Binary Number System can represent any number using digits only 0 and 1.
5. In the Octal Number System, the digit '9' is valid.
6. In the Hexadecimal System, the letter 'B' represents the Decimal value 12.
7. Roman Number System is an example of Positional Number System

Ans: 1) True 2) False 3) True 4) True
5) False 6) False 7) False

C. Short Answer Type Questions:

Que 1: What is Number System? Write the name of basic categories of Number Systems?

Ans: Number systems are used to represent numbers. Each number system has its own set of symbols and rules to represent numbers. Number systems can be divided into two basic categories:

1. Non-Positional Number Systems – Example: Roman numeral system
2. Positional Number Systems – Example: Decimal, Binary, Octal and Hexadecimal systems

Que 2: Explain Decimal Number System?

Ans: This is a Positional Number System. In this Number System, 10 different symbols 0,1, 2, 3, 4, 5, 6, 7, 8 and 9 are used to represent numbers. For this reason, this number system is called the Decimal Number System. The base/radix value of this number system is 10. This number system is also known as Base-10 system. It is the most widely used number system in daily life.

Que 3: What is Binary Number System? Who is the inventor of this Number System?

Ans: This is a Positional Number System. In this Number System, 2 different symbols 0 and 1 are used to represent numbers. For this reason, this number system is called Binary Number System. The base/radix value of this number system is 2. This number system is also known as Base-2 system. This number system is used in computer science and digital electronics. The inventor of binary number system is Gottfried Wilhelm Leibniz.

Que 4: Explain Octal Number System?

Ans: It is a Positional Number System. In this number system, 8 different symbols 0,1, 2, 3, 4, 5, 6 and 7 are used to represent numbers. For this reason, this number system is called the Octal Number System. The base/radix value of this number system is 8. This number system is also known as Base-8 system. This number system is often used in various fields such as Computer Programming, setting file permissions in the Unix OS.

Que 5: What is Hexadecimal Number System?

Ans: It is a Positional Number System. The word Hexadecimal is made up of two words 'Hexa' and 'Decimal', where 'Hexa' means 6 and 'Decimal' means 10. Therefore, this number system uses 16 symbols: ten Decimal Digits from 0 to 9 and six letter A, B, C, D, E, F (or a to f). The base/radix value of this number system is 16. This number system is also known as Base-16 system. Hexadecimal numbers are commonly used in Programming and Digital Electronics.

D. Perform the following Conversions of Number Systems:

1. $(25)_{10}$ = $(11001)_2$ = $(31)_8$ = $(19)_{16}$
2. $(10111)_2$ = $(23)_{10}$ = $(27)_8$ = $(17)_{16}$
3. $(47)_8$ = $(39)_{10}$ = $(100111)_2$ = $(27)_{16}$
4. $(A4)_{16}$ = $(164)_{10}$ = $(10100100)_2$ = $(244)_8$

1.1 Complete the following Table: (Lab Activity)

Decimal	Binary	Octal	Hexa-Decimal
0	0000	0	0
1	0001	1	1
2	0010	2	2
3	0011	3	3
4	0100	4	4
5	0101	5	5
6	0110	6	6
7	0111	7	7
8	1000	10	8
9	1001	11	9
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F

1.2 Complete the following Table: (Lab Activity)

Decimal	Binary	Octal	Hexa-Decimal
23	10111	27	17
61	111101	75	3D
23	10111	27	17
908	1110001100	1614	38C
89	1011001	131	59
17	10001	21	11
143	10001111	217	8F
31	11111	37	1F
154	10011010	232	9A
99	1100011	143	63