Class 7
Subject- Computer Science
Topic-Number System

Answer Sheet:-

A) Fill in the blanks:-

1) 10
2) Base
3) Positional value
4) Power
5) Last digit
6) Even

B) State true or false and correct it:-

1) False
   The power is reaching to the right of the base as a subscript.
2) True
3) True
4) False
   A byte consists of 8 bits.
5) False
   Tax system in number system consists of 9 digits and symbols.
6) True

C) Answer these questions:-

1) A number system is the notation for representing the numbers of a given set by using digits or other symbols.
   There are four types of number systems.
   - Decimal number system
   - Binary number system
   - Octal number system
   - Hexadecimal number system
2) Positional value system is a system where a number is defined not only e by its digits but also by its position.

3) Bit- Each digit in a binary number is called a bit.
   Nibble- Four bits together form a Nibble.
   Bytes- Eight bits form a byte.
   A word- Two bytes form a word.
   A double word- Two words form a double word.

4) The letters in hexadecimal number with their represented decimal number are:-
   A=10
   B=11
   C=12
   D=13
   E=14
   F=15
5) Write steps-
   a. Steps to convert a decimal number into a binary number:-
   I. Divide the decimal number with the base 2.
   II. Note the remainder to the digit of the dividend. Since we are converting a number into its binary equivalent. Therefore if the dividend is even the remainder will be 0 and if the dividend is odd the remainder will be 1.
   III. Divide the quotient Again by two. The quotient becomes the dividend in the next successive division.
   IV. Repeat step 2 till the quotient is 0.
   V. Write the reminders in the reverse order.
   b. Steps to convert a binary number into a decimal number:-
      I. Each digit is multiplied by 2 raised to the power its position.
      II. Add all the products calculated in step 1.
      III. The total is equivalent to the value in the decimal number system.
6) **Explain:-**
   Base- The base of a number system tells us the total number of digits used in that system.
   Subscript- It is the letter or symbol written below the line of text.
   Superscript- It is a letter or symbol written above the line of text to.

Exercise from the textbook:-

A) Tick (✓) the correct answers:-

1) a
2) a
3) c
4) c
5) d

B) Write T for true or F for false.

1. T
2. T
3. T
4. F
5. F
6. T

C) Answer these questions:-

1. The decimal number system is the number system that we use in our daily life. This number system consists of 10 digits 0 to 9. Therefore, the base of the decimal number system is 10. The base of the number system tells us the total number of digits used in that number system. Example 547 10 denotes that the decimal number 547 has base 10. It is a positional value system.

2. A computer system understands only two state on and off, which are represented by 1 and 0. The binary number system uses only 2 digits 0 and 1. This is the reason why computer uses binary number system. Since this number system uses only 2 digits therefore the base is 2. The base of a number system is placed as a subscript of a number. For example the binary number $(101011)_2$ 2 has base 2. This number system is also a positional value system.

PROJECT WORK

1. Convert the following decimal numbers into binary numbers.

a) $(88)_{10}$

		Remainder
2	88	0
2	44	0
2	22	0
2	11	1
2	5	1
2	2	0
2	1	1
	0	

$\therefore (88)_{10} \rightarrow (1011000)_2$

b) $(789)_{10}$

		Remainder
2	789	1
2	394	0
2	197	1
2	98	0
2	49	1
2	24	0
2	12	0
2	6	0
2	3	1
2	1	1
	0	

$\therefore (789)_{10} \rightarrow (1100010101)_2$

c) $(1024)_{10}$

		Remainder
2	1024	0
2	512	0
2	256	0
2	128	0
2	64	0
2	32	0
2	16	0
2	8	0
2	4	0
2	2	0
2	1	0
	0	1

$(1024)_{10} \rightarrow (10000000000)_2$

d) $(233)_{10}$

		Remainder
2	233	1
2	116	0
2	58	0
2	29	1
2	14	0
2	7	1
2	3	1
2	1	1
	0	

$\therefore (233)_{10} \rightarrow (11101001)_2$

2. Convert the following binary numbers into decimal numbers.

a) $(101110)_2$

No → 1 0 1 1 1 0

Place Value → 2^4 2^3 2^2 2^1 2^0

$\Rightarrow 0\times2^4+1\times2^3+1\times2^2+1\times2^1+0\times2^0$

$\Rightarrow 0+8+4+2+0$

$\Rightarrow 14$

$\therefore (101110)_2 \rightarrow (14)_{10}$

b) $(101010)_2$

No → 1 0 1 0 1 0

PV → 2^5 2^4 2^3 2^2 2^1 2^0

$\Rightarrow 1\times2^5+0\times2^4+1\times2^3+0\times2^2+1\times2^1+0\times2^0$

$\Rightarrow 32+0+8+0+2+0$

$\Rightarrow 42$

$\therefore (101010)_2 \rightarrow (42)_{10}$

c) $(111001)_2$

No → 1 1 1 0 0 1

PV → 2^5 2^4 2^3 2^2 2^1 2^0

$\Rightarrow 1\times2^5+1\times2^4+1\times2^3+0\times2^2+0\times2^1+1\times2^0$

$\Rightarrow 32+16+8+0+0+1$

$\Rightarrow 57$

$\therefore (111001)_2 \rightarrow (57)_{10}$

d) $(000101)_2$

No → 0 0 0 1 0 1

PV → 2^5 2^4 2^3 2^2 2^1 2^0

$\Rightarrow 0\times2^5+0\times2^4+0\times2^3+1\times2^2+0\times2^1+1\times2^0$

$\Rightarrow 0+0+0+4+0+1$

$\Rightarrow 5$

$\therefore (000101)_2 \rightarrow (5)_{10}$