**8th June, 2020 JESUS AND MARY SCHOOL AND COLLEGE MODULE 3**

**CLASS 7**

**COMPUTER SCIENCE**

**Chapter 2 - Introduction to Number System**

**Topic -**

* **Number System and its types**
* **Binary Number System**
* **Decimal Number System**
* **Octal Number System**
* **Hexadecimal Number System**
* **Binary Arithmetic (Addition, Subtraction, Multiplication and Division)**

**EXPLANATION**

**The Number System :**

* A number system is a way of writing or expressing number of a given set using digits or other symbols.
* The number system that we ordinarily use is called decimal numbers.
* Base or radix is the number of unique digits used in a number system.

**Types of Number System :**

There are four types of number system-

1. Binary number system
2. Decimal number system
3. Octal number system
4. Hexadecimal number system
5. **Binary Number System :**

* The number system which has 2 as the base is called Binary number system.
* In digital computers, the numbers, characters and special symbols are stored in the form of codes.
* Binary number system has just two numbers, they are 0 and 1.
* Every number, character, symbols can be represented by a group of binary numbers.
* This number system is used by the digital computer system.

1. **Decimal number system :**

* In decimal number system there are ten digits (numbers).
* They are : 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.
* They have ten numbers this number system is Base 10 number system.

1. **Octal number system :**

* The base 8 number system is called octal number system.
* There are only 8 digits in this system.
* The numbers are 0, 1, 2, 3, 4, 5, 6, 7.
* Octal number system can be easily converted into decimal numbers.

1. **Hexadecimal number system :**

* The base 16 number system is called hexadecimal number system.
* It uses 16 digits to represent all the numbers.
* These are the digits from 0 to 9 (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) and characters

A, B, C, D, E, F.

* This number system is also called ‘strings of digits’.
* **Binary Arithmetic :**
* Arithmetic Operations (addition, subtraction, multiplication, and division) are very common in day to day life.
* We have been doing these operations with decimal numbers only.
* We can perform these operations with binary numbers as well.
* **Binary Addition :**

We have to remember certain points before starting the binary addition.

BIT 1 BIT 2 SUM

1. + 0 = 0

0 + 1 = 1

1. + 0 = 1

1 + 1 = 0

Carry 1 = 10

**Example : (1001)2 + (1111)2 = (11000)2**

1 1 1 carry

1 0 0 1

+ 1 1 1 1

1 1 0 0 0

* **Binary Subtraction :**

For binary subtraction you need to borrow from left higher digit as in decimal subtraction.

BIT 1 BIT2 SUM

1 - 1 = 0

1 - 0 = 1

0 - 0 = 0

0 - 1 = 1

1 Borrowed from left higher digit

**Example : (111001)2- (1101)2 = (101100)2**

1 1 Borrow

1 1 1 0 0 1

- 1 1 0 1

1 0 1 1 0 0

* **Binary Multiplication :**

Multiplication of two binary numbers goes as follows-

0 × 0 = 0

0 × 1 = 0

1 × 0 = 0

1 × 1 = 1

**Example : (1101)2 × (11)2 = (100111)2**

1 1 0 1

× 1 1

1 1 0 1

1 1 0 1 ×

1 0 0 1 1 1

* **Binary Division :**

We know the addition and subtraction rules for binary numbers, we can carry the division of binary numbers.

**Example : (1101)2 ÷ (10)2 = (10)2**

1 1 0 Quotient

10 1 1 0 1 Dividend

-1 0

1 0

-1 0

1

- 0

1 Remainder

Answer will be: 110 with remainder 1

**WORKSHEET 3**

**Question/Answer :**

**Q 1.** What is number system? Explain its types.

**Q 2.** Define radix or base.

**Q 3.** Name the number system with 10 as base.

**Q 4.** In which number system, letters A, B, C, D, E and F are used?

**Q 5.** Which number system uses only 0 and 1 digits?

**Q 6.** Name the number system whose radix is 8.

**Fill in the blanks :**

1. The octal number system has ………………. unique digits.
2. The computers process the user’s data after converting it into its ……………..…. form.
3. In hexadecimal number system, the number 15 is represented by …………….………. .
4. The value of each digit in a number depends upon its position from …..…… to …….. .
5. The digits 0 and 1 are called ……………. in binary number system.
6. All digital computers use ……………….. number system.
7. ….…………….. is the only machine understandable language.
8. The number of unique digits used in a number system is known as ………………. .

**Match the following :**

1. (11)10 Binary number system
2. (1001)2 Decimal number system
3. 0, 1, 2, 3, ………… 7. Hexadecimal number system
4. 0, 1, 2, 3, ……., F. Octal number system

**Given below are the answers to module 2 uploaded on 25th May 2020.**

**WORKSHEET 2**

* **Question / Answer :**

**Q1.** What is a sound card?

**Ans.** Sound card is an electronic card that provides input and output of audio signals to and from a computer.

**Q2.** What is a touchscreen?

**Ans.** Touchscreen is a device which gives input to a computer by sensing the touch of a finger. We use our finger to point directly to objects on the screen and select them.

**Q3.** What is a motherboard?

**Ans.** The motherboard, which is also referred to as the main board, is an electronic circuit board which connects all parts of the computer together. The devices like CPU, memory, hard drives, ports and other expansion cards are connected directly or via cable to the motherboard.

**Q4.** What is the use of VGA port?

**Ans.** VGA is a standard type of connection used to connect video devices such as monitors and projectors. It is mainly used to transfer analog video signals from one machine to another through VGA cable.

**Q5.** What is the USB port?

**Ans.**  USB port is a standard cable connection for PCs and other electronic devices. USB connected devices cover a board range from keyboard to mouse, music player, pen drives, etc.

* **Fill in the blanks :**

1. **Dot matrix printer** is an example of impact printer.
2. **VGA** port is used to connect monitor to a computer’s video card.
3. A **motherboard** is connected to all other hardware components, internal or external, of the computer directly or indirectly.
4. **OMR** device is used to read mark made by a pencil or a pen on a special sheet.
5. **SMPS** is used to supply the electric current to all parts of a computer.

* **Give the full forms of :**
  + - 1. CPU - Central Processing Unit
      2. SMPS - Switched Mode Power Supply
      3. RAM - Random Access Memory
      4. ROM - Read Only Memory
      5. HDMI - High Definition Multimedia Interface

**Note- Please do all this work in your “Copies” OR “Notebooks” which will be checked when school reopens. Please consider this important.**

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