Practical No. 13

Title: Introduction to 8085 Microprocessor Kit

Objective:

To study and understand the architecture, components, and working of the **8085 Microprocessor Kit** used for programming and hardware interfacing.

Theory:

Introduction to the 8085 Microprocessor:

The **8085 microprocessor** is an **8-bit** microprocessor developed by Intel. It follows the **Von Neumann architecture** and has a **16-bit address bus**, allowing it to access **64KB of memory**. It operates on a **+5V power supply** and runs at a **clock speed of 3 MHz**.

Features of the 8085 Microprocessor:

- **8-bit data bus** (processes 8-bit data at a time).

- **16-bit address bus** (can access 64KB memory).

- **74 instructions** (supports a variety of arithmetic, logical, branching, and control operations).

- **5 flag registers** (Sign, Zero, Auxiliary Carry, Parity, Carry).

- **5 addressing modes** (Immediate, Direct, Register, Indirect, and Implicit).

Components of an 8085 Microprocessor Kit:

The **8085 Microprocessor Kit** is a development board used for executing assembly language programs. It contains:

1. **8085 CPU** – The main processing unit of the kit.

2. **Memory Unit (ROM & RAM)** – Stores programs and data.

3. **Input and Output Ports** – Used to interface external devices.

4. **Keypad & Display (Optional)** – Allows user interaction.

5. **Power Supply (+5V DC)** – Provides power to the system.

6. **Crystal Oscillator (3 MHz)** – Provides clock signals.

7. **Data and Address Buses** – Used for data transfer.

8. **Monitor Program (Stored in ROM)** – Helps in executing programs.

Materials/Tools Required:

- **8085 Microprocessor Kit**

- **Power Supply (5V DC Adapter)**

- **LEDs, Switches, and 7-Segment Display (for interfacing)**
- **Assembler Software (for programming)**
- **Computer with Serial Interface (if required for programming)**

Procedure:

1. **Power ON the Kit:**

   o Connect the **5V power supply** to the microprocessor kit.

   o Ensure that the system is **properly initialized**.

2. **Understanding the Keyboard and Display:**

   o If the kit has a **hexadecimal keyboard**, use it to enter machine code.

   o Use the **7-segment display or LCD screen** (if available) to view results.

3. **Writing and Executing a Simple Program:**

   o Write a simple assembly language program (e.g., adding two numbers).

   o Enter the machine code into the kit memory.

   o Execute the program using the **RUN command**.

   o Observe the output on the display.

4. **Interfacing with External Devices:**

   o Connect **LEDs, switches, or sensors** to the I/O ports.

   o Write a program to **control LEDs or read switch inputs**.

5. **Reset and Shutdown:**

   o Use the **RESET button** to restart the kit.

   o Power OFF the kit after execution.

Observations:

- The **8085 microprocessor kit** successfully runs **assembly language programs**.
- Input and output devices can be controlled using **IN and OUT instructions**.
- The memory unit stores programs and processes data efficiently.

Conclusion:

The 8085 Microprocessor Kit provides a **practical platform** to understand **low-level programming, hardware interfacing, and microprocessor operations**. It plays a crucial role in **embedded systems and digital electronics applications**.

Applications:

- Used in **embedded systems development**.

- Applied in **traffic signal control, automation, and industrial control systems**.

- Essential for **teaching microprocessor programming and interfacing techniques**.