**Lab Title: Introduction to Algorithm & Flow Charts**

**Objective**

* To understand the basics of algorithms and flowcharts.
* To practice writing algorithms for problem-solving.
* To design flowcharts to visually represent algorithms.

**Lab Outline**

**1. Introduction of Algorithm**

* **Definition**: An algorithm is a step-by-step procedure to solve a specific problem in a finite amount of time.
* **Lab Task**:
  1. Write down an algorithm to add two numbers.

**Example:**

Step 1: Start

Step 2: Input two numbers, A and B

Step 3: Compute Sum = A + B

Step 4: Output Sum

Step 5: End

**2. Characteristics of Algorithm**

* **Characteristics**:
  1. Must have a clear end.
  2. Steps must be clear and unambiguous.
  3. Accept zero or more inputs.
  4. Produce at least one output.
  5. Achievable within finite time and resources.
* **Lab Task**: Analyse the provided algorithm for addition (above) and verify its characteristics.

**3. How to Write an Algorithm**

* **Steps for Writing**:
  1. Understand the problem clearly.
  2. Break it into smaller tasks.
  3. Write steps to solve these tasks logically.

**Lab Task**: Write an algorithm for:

* 1. Finding the largest of three numbers.
  2. Converting Celsius to Fahrenheit.

**4. Advantages of Algorithm**

* Simplifies problem-solving.
* Helps in debugging and testing.
* Provides a blueprint for coding.
* **Lab Task**: Discuss and document three additional advantages based on your own understanding.

**5. Examples of Algorithm**

* **Examples**:
  1. Sorting an array.
  2. Searching for a number in a list.
  3. Calculating factorial.
* **Lab Task**: Choose one of the above examples and write an algorithm for it.  
  Example for calculating factorial:

Step 1: Start

Step 2: Input a number, N

Step 3: Initialize Factorial = 1

Step 4: Loop from i = 1 to N

Factorial = Factorial \* i

Step 5: Output Factorial

Step 6: End

**Expected Outcomes**

* Students can define and describe algorithms.
* Students can write simple algorithms.
* Students understand the characteristics and advantages of algorithms.