## **1.0 Introduction**

A computer is a very powerful and versatile machine capable of performing a multitude of different tasks, yet it has no intelligence or thinking power. The intelligence Quotient (I.Q) of a computer is zero. A computer performs many tasks exactly in the same manner as it is told to do. This places responsibility on the user to instruct the computer in a correct and precise manner, so that the machine is able to perform the required job in a proper way. A wrong or ambiguous instruction may sometimes prove disastrous.

In order to instruct a computer correctly, the user must have clear understanding of the problem to be solved. A part from this he should be able to develop a method, in the form of series of sequential steps, to solve it. Once the problem is well-defined and a method of solving it is developed, then instructing he computer to solve the problem becomes relatively easier task.

Thus, before attempt to write a computer program to solve a given problem. It is necessary to formulate or define the problem in a precise manner. Once the problem is defined, the steps required to solve it, must be stated clearly in the required order.

## 1.1 Procedure (Steps Involved in Problem Solving)

A computer cannot solve a problem on its own. One has to provide step by step solutions of the problem to the computer. In fact, the task of problem solving is not that of the computer. It is the programmer who has to write down the solution to the problem in terms of simple operations which the computer can understand and execute.

In order to solve a problem by the computer, one has to pass though certain stages or steps. They are

- 1. Understanding the problem
- 2. Analyzing the problem
- 3. Developing the solution
- 4. Coding and implementation.

1. Understanding the problem: Here we try to understand the problem to be solved in totally. Before with the next stage or step, we should be absolutely sure about the objectives of the given problem.

2. Analyzing the problem: After understanding thoroughly the problem to be solved, we look different ways of solving the problem and evaluate each

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of these methods. The idea here is to search an appropriate solution to the problem under consideration. The end result of this stage is a broad overview of the sequence of operations that are to be carries out to solve the given problem.

**3.** Developing the solution: Here the overview of the sequence of operations that was the result of analysis stage is expanded to form a detailed step by step solution to the problem under consideration.

4. Coding and implementation: The last stage of the problem solving is the conversion of the detailed sequence of operations in to a language that the computer can understand. Here each step is converted to its equivalent instruction or instructions in the computer language that has been chosen for the implantation.

1.2 Algorithm

## Definition

A set of sequential steps usually written in Ordinary Language to solve a given problem is called **Algorithm**.

It may be possible to solve to problem in more than one ways, resulting in more than one algorithm. The choice of various algorithms depends on the factors like reliability, accuracy and easy to modify. The most important factor in the choice of algorithm is the time requirement to execute it, after writing code in High-level language with the help of a computer. The algorithm which will need the least time when executed is considered the best.

## Steps involved in algorithm development

An algorithm can be defined as "a complete, unambiguous, finite number of logical steps for solving a specific problem "

**Step1. Identification of input**: For an algorithm, there are quantities to be supplied called input and these are fed externally. The input is to be indentified first for any specified problem.

**Step2: Identification of output**: From an algorithm, at least one quantity is produced, called for any specified problem.

**Step3 : Identification the processing operations** : All the calculations to be performed in order to lead to output from the input are to be identified in an orderly manner.

**Step4 : Processing Definiteness** : The instructions composing the algorithm must be clear and there should not be any ambiguity in them.