Introduction to Computer

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. Therefore computer needs to be instructed correctly and for that the user must have clear understanding of the problem to be solved.

Problem solving technique (Procedure for solving problem):

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 of these methods. The idea here is to search an appropriate solution to the problem under consideration.

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.

Algorithm:

Algorithm can be defined as the sequence of precise instructions that leads to a solution. 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.

Steps involved in algorithm development:

Step 1: Identification of input

The input for the problem to be solved needs to be identified at first.

Step 2: Identification of output

The expected output of the problem is identified.

Step 3: Identification of processing operations

All the calculations to be performed in order to lead to output from the input is identified.

Step 4: Processing definiteness

It should be ensured that the algorithm is clear and doesn't posses any ambiguity.

Step 5: Processing finiteness

It should be ensured that the program terminates after certain steps and the terminating condition should be specified.

Step 6: Processing effectiveness

It should be ensured that the instructions in the algorithm are practicable and can be carried out easily.

Algorithm should posses following properties:

1. Finiteness:
An algorithm must terminate in a finite number of steps.

2. Definiteness:
Each step of the algorithm must be precisely and unambiguously stated.

3. Effectiveness:
Each step must be effective, in the sense that it should be primitive easily convert able into program statement) can be performed exactly in a finite amount of time.

4. Generality:
The algorithm must be complete in itself so that it can be used to solve problems of a specific type for any input data.

5. Input/output:
Each algorithm should take one or more input and produce relevant output. An algorithm can be written in English like sentences or in any standard

representation. Smetimes, algorithm written in English like languages are called Pseudo Code .

Example:

Suppose we want to find the average of three numbers, the algorithm is as follows:

Step 1: Read the numbers a, b, c .
Step 2 :Compute the sum of a, b and c.
Step 3 :Divide the sum by 3 .
Step 4 :Store the result in variable d.
Step 5: Print the value of d .
Step 6: End of the program .

Flow Chart:

A flow chart is a step by step diagrammatic representation of the logic paths to solve a given problem. Or A flowchart is visual or graphical representation of an algorithm.

Advantages of Flowcharts

1. The flowchart shows the logic of a problem displayed in pictorial fashion which facilitates easier checking of an algorithm.

2. The Flowchart is good means of communication to other users. It is also a compact means of recording an algorithm solution to a problem.

3. The flowchart allows the problem solver to break the problem into parts. These parts can be connected to make master chart.

4. The flowchart is a permanent record of the solution which can be consulted at a later time.

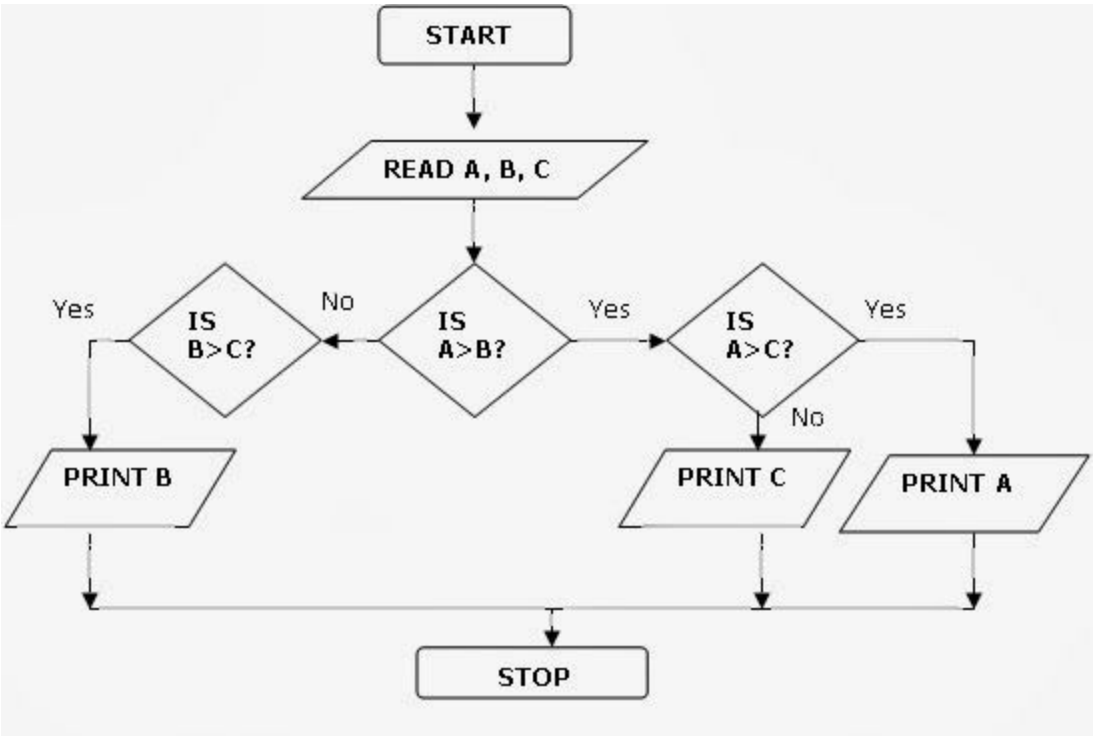
Flow Chart Symbols

Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision

Fig: Flow Chart Symbols

Example:

Flowchart to find the largest among three numbers



Assignment Questions:

1. Explain unstructured programming, procedural programming, modular programming (Structured Programming) and Object Oriented Programming.
2.