CHAPTER NO. 01 PROGRMMING TECHNIQUES

EXERCISE

Short Questions

Q. No. 01: Define Computer.

Ans: Computer is an electronic general purpose machine used to solve different problems according to a set of instructions given to it. It can accept input from input devices and process that input by using processing unit called CPU and produce accurate results. The word computer is derived from compute that means to calculate. It can also solve different problems quickly and efficiently.

Q. No. 02: What is algorithm and what is the role of algorithm in problem solving?

Ans: An algorithm is a step by step problem solving procedure used to solve a specific problem before writing actual program. It is written in a simple English language called pseudo code i.e start, take input , read , get, print etc.

Characteristics of an algorithm:
Steps should be finite in number.
Statements should be clear and precise.
At the time of termination it produces some output.

Role of algorithm in problem solving:
Algorithm plays very important role in problem solving. Programmers before writing actual program must write an algorithm first because it is the first step before writing any program in any programming language.

Q. No. 03: What is flowchart?

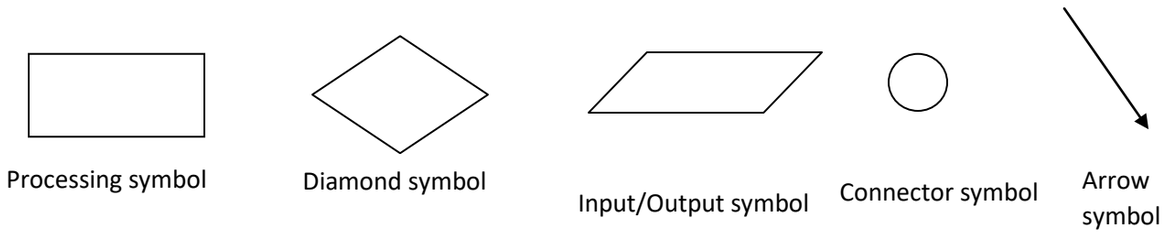
Ans: A flowchart is a pictorial representation of an algorithm or a process. It shows the steps of the algorithm with the help of different symbols, these symbols are linked together with arrows to show the flow of process. Once the flowchart is drawn, it becomes very easy to write the program in any high level language.

Q. No. 04: What are the advantages of using flowcharts?

Ans: Following are the advantages of using the flowchart:
Flowchart provides an easy way to analyze and find the solutions of a problem.
It helps in communicating the problem solving method to other people.
It also helps in finding and removing errors in computer programs.

Q. No. 05: Draw any four graphical symbols used in flowchart and explain them.

Ans: Following are the symbols of Flowchart:



Processing Symbol: It is called rectangle symbol. It is used to represent manipulation/calculations in flowchart.

Diamond Symbolo: It is used to take decisions in the flowchart i.e if 5>4 etc.

Input/Output Symbol: It is called parallelogram symbol and used to represent input and output operations in flowchart.

Connector Symbol: It is used to connect two or more flow lines in the flowchart.

Arrow Symbol: It is used to connect one symbol to other symbol in the flowchart.

Extensive Questions

Q. No. 01: Describe the steps involved in problem solving.

Ans: The following five steps are involved in problem solving on the computer:

1. Defining the problem
2. Analyzing the problem
3. Planning the solution of the problem
4. Candid solutions of a problem
5. Select the best solution

1. Defining the problem:- The first phase or step of problem solving is to clearly define the problem to be solved. All requirements related to the problem/software/project are documented and approved by the customer or the company.
2. Analyzing the problem:- In analyzing step of problem solving is to study the current system in detail to find how it works and how to improve it by gathering much information from system users.
3. Planning the solution of the problem:- In planning step of the problem solving we determine the objective of the problem/project. It refers to dividing the solution into steps and arranging them into proper order that will solve the problem. It is also used to prepare an estimate of different resources such as personnel and costs.
4. Candid Solutions of a problem:- Candid solutions means all the possible solutions of a problem that produce correct result are known as candid solutions. The programmer has to look for different methods to solve the problem and come up with several solutions.
5. Select the best solution:- After candid solutions, only one solution can be selected on the basis of the following criteria i.e speed, cost and complexity.

Q. No. 02: Write an algorithm to calculate the area of rectangle for given breath and length.

Ans: Algorithm to calculate area

Step-1: Start
    Take length and width
Step-2
    Multiply length and width to calculate area
Step-3
    Print area

Q. No. 03: Write an algorithm that inputs length in inches and calculates and prints it in centimeters.

Ans: Algorithm to calculate in inches to centimeters

Step-1: Start

    Take length in inches
Step-2
    Multiply length in inches with 2.54
Step-3
    Print result in centimeters

Q. No.04: Write an algorithm that inputs marks and prints the message " PASS" or "FAIL" . Passing marks are 33.

Ans: Algorithm to print pass or fail

Step-1: Start
Take marks i.e M
Step-2
Check if<33 then print "Fail" goto step 4
Step-3
Else print "Pass"
Step-4
Stop

Q. No. 05: Write an algorithm to find the sum of given sequence.

Sum=20+35+25+30+35+40+45+50+55+60

Ans: Algorithm to find sum

Step-1: Start
Take sum to 0 and k=5
Step-2
Add k to sum i.e sum=sum+k
Step-3
Increment k by 5 i.e k=k+5
Step-4
Check if value of k is less than or equal to 60 i.e
If(k<=60) then goto step 2 else goto step 5
Step-5
Print sum
Step-6
Stop

Q. No. 06: Write an algorithm to find the product of given numbers.

Product=1X3X5X7x9X11X13X15

Ans: Algorithm to find product

Step-1: Start
Take k to 1 and prod to 1
Step-2
Increase k by 2 i.e k=k+2
Step-3
Multiply prod by k and assign value to prod i.e prod=prod X k
Step-4
Check if value of k is less than 16 i.e
If(k<16) then goto step 2 else goto step 5
Step-5
Print prod
Step-6
Stop

Q.No. 07: Write an algorithm to print multiplication table of a number in reverse order.

Ans: Algorithm to print table in reverse order

Step-1: Start
Take N to 5 and I to 10
Step-2
Multiply N with I and assign to T i.e T= N * I
Step-3
Print N , I and T
Step-4
Decrease the value of I by 1 i.e I=I-1
Step-5
Check the value of I is greater than 0 then goto 2 else goto step 6
Step-6
Stop

Q. No. 08: Convert the algorithm of questions Q.4 to Q.9 to flowcharts.

Home work for students to draw flowcharts of this question