PART-A
PROBLEM SOLVING AND PYTHON PROGRAMMING

1. Define Algorithm

Algorithm : It is a sequence of instructions designed in such a way that if the instructions are executed in the specified sequence, the desired results will be obtained. The instructions in an algorithm should not be repeated infinitely. The algorithm should be written in sequence.

2. What are the properties of algorithm?
- It is written in simple English.
- Each step of an algorithm is unique and should be self
- explanatory. An algorithm must have at least one input.
- An algorithm must have at least one
- output. An algorithm has finite number of steps.

3. What are the building block of algorithm?

The three building block of algorithm are :
- Sequence
- Selection
- Iteration

4. What is meant by selection, iteration and sequence controlstructures?

Sequence:

A sequence is one of the basic logic structures in computer programming. In a *sequence* structure, an action, or event, leads to the next ordered action in a predetermined order.

Selection:

A selection (also called a decision) is also one of the basic logic structures in computer programming. In a *selection* structure, a question is asked, and depending on the answer, the program takes one of two courses of action, after which the program moves on to the next event.

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5. Define Flowchart

It is a pictorial representation of an algorithm. The flowchart uses different shape symbols to denote the different appropriate instructions and these instructions can be written within the boxes using clear statements.

6. Write the Characteristics of Pseudo code.
Named variables represent data and identifiers denote higher level
functions.
Composed of a sequence of statements or steps.
- Statements are often numbered sequentially.
- Operational (Imperative) statements include assignment, input, and outpu
Control structures provide iterative and conditional execution.
Indentations used for grouping b

8. What is need for flowchart symbol?
The need for flowchart symbols because each symbols of different shapes denotes different types of instructions. The program logic through flowcharts is made easier through the use of symbol that has standardized planning.

9. Write some rules for drawing a flowchart.

10. What are the advantages of using a flowchart
- Communication
- Effective
- Proper
- Documentation
- Efficient Coding
- Proper
- Debugging
- Efficient Program Maintenance

11. Write any two disadvantages of flowchart ?
- It is not visual
- We do not get a picture of the design.

12. What is Pseudo code?
―Pseudo‖ means imitation of false and ―code‖ refers to the instruction written in a programming language. Pseudo code is programming analysis tool that is used for planning program logic.

13. Write the Characteristics of Pseudocode.
- Named variables represent data and identifiers denote higher level
- functions.
- Composed of a sequence of statements or steps.
- Statements are often numbered sequentially.
- Operational (Imperative) statements include assignment, input, and
- output.
- Control structures provide iterative and conditional execution.

- Indentations used for grouping blocks of statement

14. What are the rules for writing pseudo code?
- Write one statement
- per line. Capitalize
- initial keywords.
- Indent to show hierarchy.
- End multiline structure.
- Keep statements language independent.

15. Write any two advantages of pseudo code.

It can be done easily in any word
processor.
- It can be written easily.
- It can be easily modified as compared to flowchart.

16. Write any two disadvantages of flowchart?
- It is not visual
- We do not get a picture of the design.

17. Differentiate Algorithm and Pseudo code

S.No	Algorithm	Pseudo code
1.	It is a well-defined procedure that allows a computer to solve a problem.	It is a simple way of writing programming code in English.
2.	Algorithms can be described in various ways, from pure mathematical formulas to complex graphs	Pseudo code describes how you would implement an algorithm without getting into syntactical details.

18. What is the difference between algorithm and flowchart

S.No	Algorithm	Flow Chart
1.	Step by Step formation	Box by box formation
2.	Mostly run to complete or manage a program implementation.	Can be used in general terms to solve any problem related to an individual or a group.
3.	More detailed but difficult to understand	Lessdetailed but easyto understand by everyone.

PART-B

1. Define algorithm. Explain in detail about the building blocks of algorithm.
2. What is flowchart. Explain the Basic design structures in Flowchart
3. What is pseudo code? Explain its guidelines and benefits.
4. Explain the design structures in pseudo code.
5. Explain the steps involved in program development cycle.
6. Write the algorithm, pseudocode and draw the flowchart for the following:
   a. Find minimum in a list.
   b. Insert a card in a list of sorted cards.
   c. Guess an integer number in a range.
   d. Towers of Hanoi.
7. Write the algorithm, pseudocode and draw the flowchart for the following:
   a) To find the sum of square root of any three numbers.
   b) To find the sum of first 100 integers.
   c) To find the sum of all odd numbers till 100.
   d) To find the sum of any five integers.
   e) To find the factorial of number n.
   f) To find the first n numbers in a Fibonacci series.
   g) To find the sum of digits of a number.
   h) To find whether a number is prime or not.
   i) To convert temperature from Fahrenheit to Celsius
   j) To solve the quadratic equation.
   k) To find sum first 100 natural numbers.
   l) To find factorial of a number.