

Chapter I : Problem Solving

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Q.1. Define problem.

A problem is a situation or matter that requires proper attention to be resolved.

Q.2. What Is problem statement?

A problem statement is a brief description of the problem to be solved. It describes the problem and identifies its causes and solutions. The problem statement must be prepared before finding the solution of the problem.

Q.3. What Is problem solving?

Problem solving is a process of identifying a problem and finding its best solution. Problem solving is a thinking process. It is a skill that can be developed by following a well-organized approach.

Q.4. Write the names of steps that are involved in problem solving.

The steps involved in problem solving are defining the problem, analyzing the problem, planning the solution, finding solutions and selecting the best solution.

Q.5. Why is it important to define a problem?

A problem cannot be solved if it is not defined correctly. The clearly defined problem helps the user to find the solution.

Q.6. List three strategies to define a problem.

Three strategies to define a problem include gain back knowledge, use guesses, and draw a picture.

Q. 7. Why is It important to gain background knowledge of a problem?

It is important to understand the situation and circumstances in which the problem is occurring. It allows the user to understand the given state. It also helps to know what the solution will look like and how to measure the solution.

Q.8. What Is problem analysis? Why Is It Important?

Problem analysis is a process of understanding the given problem. It is very important to understand a problem before trying to solve it. A clear understanding of a problem helps the user to solve it correctly and easily. It also saves money, time and resources.

Q.9. List five Ws to understand a problem.

The five Ws to understand a problem are What, Who, Why, When and Where.

Q.10. What happens in the phase of planning the solution of a problem?

The solution of a problem is planned after defining and analyzing the problem. The problem is assessed to find the right strategy to solve the problem. This phase specifies the actions required to solve the problem. It also specifies the resources required for the solution.

Q. 11. State different strategies to plan the solution of a problem.

Different strategies to plan the solution of a problem include divide and conquer; guess, check and improve; and act it out.

Q. 12. Which strategy divides a complex problem into smaller problems and why?

The divide and conquer strategy divide a complex problem into smaller problems. The smaller problems can be solved separately. The process of solving the problem becomes easier. It also reduces the complexity of the solution.

Q: 13. What Is candid solution of a problem?

The word candid means something unplanned. The candid solution is typically found using guess without detailed planning. It saves a lot of time but may not be the actual solution of the problem.

Q. 14. What is flowchart?

Flowchart is a graphical representation of the solution of a problem. Standard symbols are used to represent different steps of solution. Different symbols are used in flowcharts to represent different operations.

Q. 15. Write any four flowchart symbols.

The four flowchart symbols include terminal. input/output, process, and flow line.

Q. 16. What Is the Importance of flowcharts?

The flowchart is an important tool in problem solving. It can be used to plan the solution in problem solving. The solution can be understood easily with the help of a flowchart. It also helps the user to verify if the solution is correct or not.

Q.17. Write any three advantages of flowchart.

Flowchart is easy to draw. It helps to understand the problem solution easily. It clearly shows the flow from one step to other.

Q. 18. How Is a flowchart constructed?

A flowchart is constructed by determining different requirements for the given problem. These requirements Include input processing, decision, and output.

Q.19. How can you show the sequence of the execution of the steps in flowchart?

The sequence of the execution of the steps in flowchart are shown using the flow lines. The sequence is generally shown from top to bottom.

Q.20. Which symbol Is used to show processing in flowchart?

The rectangle is used to represent a processing or computational operation in flowchart.

Q.21. What Is the purpose of parallelogram and rectangle symbol in flowchart?

Parallelogram Is used to represent input or output step in the flowchart. Rectangle is used to represent a processing or computational operation in the flowchart.

Q.22. Which symbol Is used to start and end the flowchart?

The oval symbol is used to start and end the flowchart. It is also called terminal symbol.

Q.23. What is the use of decision symbol?

The decision symbol is used to represent decision in flowchart. A condition is given in the diamond symbol. The flow of control from diamond symbol may go in two possible directions. It goes to one direction if condition is TRUE and to second direction if the condition is false.

Q.24. Define algorithm.

An algorithm is a finite number of steps to solve a problem. Th steps given in the algorithm are in a specific order. The steps may consist of input, process, decision, and output.

Q.25. Differentiate between flowchart and algorithm.

Flowchart: use of standard symbols but algorithm uses of simple English. Flowchart is more time-consuming, but algorithm is less time-consuming. Flowchart is difficult to modify but algorithm is easier to modify.

Q.26. What Is the role of algorithm in solving a problem?

An algorithm plays an important role in solving a problem. It is the plan for solving the problem. It helps the user to find the solution of the problem. The process of solving a problem becomes simpler and easier with the help of algorithm.

Q.27. Is it necessary for an algorithm to solve problem in finite number of steps? If yes, why?

Yes, it is necessary for an algorithm to solve problem in finite number of steps. The reason is that the solution of any problem cannot consist of infinite steps. The algorithm has a clear start and end. The solution is found when all steps are performed in a sequence.

Q.28. What Is the role of input in the efficiency of an algorithm?

The role of input is very important in the efficiency of an algorithm. An efficient algorithm must clearly define the required input to solve the problem.

Q.29. What factors are used to measure the efficiency of an algorithm?

The efficiency of an algorithm is measured on the basis of number of steps in algorithm and space in computer memory. An algorithm is more efficient if it takes less number of steps to solve a problem. An algorithm is more efficient if it takes less space in computer memory.

Q.30. What is test data?

The test data is used to check the correctness of an algorithm. It is important to test the output of the algorithm after solving a problem. Different values of test data is given to the algorithm as input. The output is checked to confirm that the algorithm works correctly.

Q.31. Why testing of a solution important?

Testing is very important to ensure the correctness of the solution. It can be used to find any errors in the solution. It helps the user to modify and improve the solution. "The testing becomes even more critical if the solution is used commercially.

Q.32. Differentiate between valid and invalid test data.

A type of test data that is according to the input requirements of an algorithm is called valid test data. A type of test data that is not according to the input requirements of an algorithm is called invalid test data.

Q.33. What Is boundary test data?

The smallest or the largest data values from the range of valid test data is called boundary test data. An algorithm is tested with the boundary test data to ensure that it handles these values correctly.

Q.34. What do you mean by absent data?

The absent data means that the number of values given to a solution is less than expected.

Q.35. What Is the process of verification?

Verification is the process to test if the solution is solving the same problem for which it was designed. Suppose an algorithm is prepared to find the percentage of a student and assign the grade. The user can observe if the algorithm inputs marks and displays grade.

Q.36. What is the process of validation?

Validation is the process to test if the solution is correct or not. Suppose an algorithm is prepared to find the percentage of a student and assign the grade. The user can check the output of the algorithm to confirm that the grade is assigned correctly.

Q.37. What is trace table?

A trace table is a technique of testing the algorithm to ensure that it does not have any logical errors. The trace table usually consists of multiple rows and columns. Each column shows the name of the data element. Each row shows the value of data element in each step.

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