TYPE-A:INTRODUCTION TO PROBLEM SOLVING:CH-4

1. What are the phases of program solving cycle?

sol:

- Problem Analysis – Understand the problem.
- Algorithm Design – Write steps to solve it.
- Flowchart / Pseudocode – Show the steps clearly.
- Coding – Write the program.
- Testing and Debugging – Find and fix errors.
- Execution – Run the program.
- Documentation and Maintenance – Record and improve the program

2. What do you do while analysing a problem ?

sol:

While analysing a problem, we do the following:

- Understand the problem clearly.
- Identify the input (what is given).
- Identify the output (what is required).
- Find the steps needed to solve the problem.
- Break the problem into small parts.
- Decide the method to solve the problem.

3. What is done during coding phase ?

sol:

During the coding phase, we do the following:

- Convert the algorithm or flowchart into a program.
- Write instructions using a programming language.
- Follow correct syntax and rules of the language.
- Use proper variables and statements.
- Make the program clear and readable.
- Check the program for small mistakes.

4. What is testing and debugging?

sol:

Testing

- Testing means running the program to check whether it works correctly or not.
- It helps to find errors in the program.
- Different inputs are used to see if the output is correct.

Debugging

- Debugging means finding and correcting the errors in the program.
- It is done after testing.
- Errors may be due to wrong logic, wrong syntax, or wrong values.

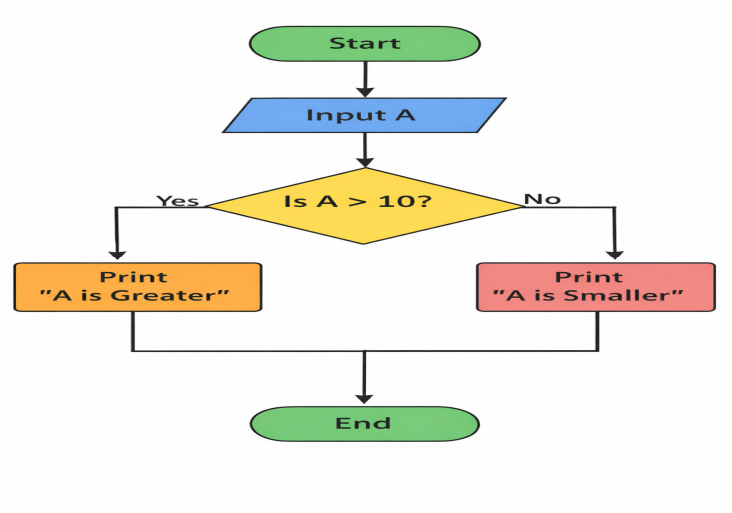
5. Distinguish between a condition and a statement

sol:

Condition	Statement
A condition is a test or comparison.	A statement is an instruction in a program.
It checks whether something is true or false.	It tells the computer what action to perform.
It gives only two results: True or False.	It does not give True or False.
Used in decision-making (if, while).	Used to perform operations (input, output, assignment).

6. Draw a flowchart for conditional statement.

sol:



7. Both conditional statement and iterative statement have a condition and a statement. How do they differ ?

sol:

Conditional Statement	Iterative Statement
It is used for decision making.	It is used for repetition (looping).
The condition is checked once.	The condition is checked again and again.
The statement is executed once.	The statement is executed many times.
It selects one path based on the condition.	It repeats the same steps while the condition is true.
Examples: if, if–else	Examples: while, for, do–while

8. What is decomposition?

sol:

Decomposition is the process of breaking a big problem into smaller and simpler parts. Each small part is solved one by one.

9. Name some tools used for problem solution development.

sol:

- Algorithms – Step-by-step instructions to solve a problem.
- Flowcharts – Diagrams showing the flow of steps.
- Pseudocode – Simple description of steps using plain language.
- Decision Tables – Tables showing conditions and corresponding actions.
- Programming Languages – Tools to write the actual program (like C, Python, Java).

10. What is the difference between an algorithm and a program?

sol:

Algorithm	**Program**
A step-by-step method to solve a problem.	A set of instructions written in a programming language.
Written in plain language or pseudocode.	Written in a programming language like Python, C, or Java.
Focuses on **logic and steps**.	Focuses on **execution by computer**.
Not directly executable by a computer.	Can be executed by a computer.
Helps in planning the solution.	Implements the solution practically.

11. What is dry run? How is it useful ?

sol:

- A dry run is a method of manually checking a program step by step without actually running it on a computer.
- We track the values of variables and the flow of the program.
- It is done on paper or in mind

12. What is trace table?

sol:

- A trace table is a table used to track the values of variables in a program during a dry run.
- It helps us follow how variables change step by step.
- It is usually made with columns for variables and rows for each step of the program.