Computational Thinking

MCQs and Short Questions

Q1. Define computational thinking.

Computational thinking is a problem-solving method that involves breaking down problems, recognizing patterns, using abstraction, and designing step-by-step solutions that a computer can follow.

Q2. What is decomposition in computational thinking?

Decomposition is breaking a large and complex problem into smaller, more manageable parts.

Q3. Explain pattern recognition with an example.

Pattern recognition means identifying similarities or trends in problems. Example: When solving math equations like 2+2, 3+3, and 4+4, you notice a pattern that each number is doubled.

Q4. Describe abstraction and its importance in problem-solving.

Abstraction is focusing only on important details and ignoring unnecessary information. It helps simplify problems and prevents confusion.

Q5. How does problem understanding help in computational thinking?

It helps to clearly identify the requirements, set goals, avoid mistakes, and create efficient solutions.

Q6. Why problem understanding is important in computational thinking?

Problem understanding provides clarity, define a goal, avoid mistakes and create efficient solution.

Q7. What are flowcharts and how are they used?

A flowchart is a graphical representation that shows the steps of an algorithm using symbols. It is used to plan, design, and explain problem-solving steps clearly.

Q8. Why flowchart is important in computational thinking?

Flowchart is use to plan, design, understand and identify the problem-solving steps clearly.

Q9. What is the use of oval /terminal symbol in flowchart?

Oval / terminal symbol is used to start or end of flowchart.

Q10. Write the use of rectangle symbol of flowchart?

Rectangle symbol is used to represent operation on data, store a value or computational result.

Q11. What is the purpose of Parallelogram symbol of flowchart?

Parallelogram symbol represent data input or output. e.g taking value from user and display result to user.

Q12. What is use of diamond symbol of flowchart?

Diamond symbol of flowchart is used for decision making. Decision is taken on the result of condition that can be true or false.

Q13. What is the purpose of arrow of flowchart?

Arrow called flow line show the flow of data from one step to another. Flow line connect different symbols of flowchart to indicate sequence of steps

Q14. What is an algorithm?

An algorithm is a step-by-step set of instructions used to solve a problem or perform a task.

Q15. Explain the purpose of pseudocode.

Pseudocode is a plain or simple language description of an algorithm. It helps programmers plan the logic of a program before writing the actual code.

Q16. How do you differentiate between flowcharts and pseudocode?

Flowchart	Pseudocode
Flowcharts use symbols and arrows to represent steps of problem.	Pseudocode uses simple language statements to describe steps of problem.

Q17. How to measure the efficiency of an algorithm?

Efficiency of an algorithm can be measure by two methods, time complexity and space complexity.

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Q18. What is the difference between Time complexity and space complexity?

Time Complexity	Space Complexity
Time complexity measures the amount of time an algorithm takes to run when size of input is change. e.g O(n) take less time as compare to $O(n^2)$	Space complexity measures the amount of memory space an algorithm use when the size of input is change. e.g O(1) use less memory as compare to O(n)

Q19. What is a dry run and why is it important?

A dry run is manually testing an algorithm or flowchart with sample data before actual coding. It is important because it helps detect errors early.

Q20. Describe LARP and its significance in learning algorithms.

LARP stands for Logic of Algorithm for Resolution Problems. It is educational software teach the fundamentals of structured programming using pseudocode and flowcharts. LARP helps to understand how algorithm work, seeing the result for different inputs and output and practice writing, improving your own algorithm.

Q21. Why LARP is important?

LARP helps to understand how algorithm work, seeing the result for different inputs and output and practice writing, improving your own algorithm.

Q22. What is bug or error? How many its types

When writing an algorithm or drawing flowcharts some mistakes can be occur. These mistakes are called bugs or errors. Three types of errors can occur in your algorithm or flowchart. These errors are syntax errors, Logical errors and runtime errors.

Q23. What is meant by debugging?

Debugging is a process to finding and removing errors in your algorithm or program.

Q24. What is syntax error?

When your algorithm or flowchart has violated some grammatically rules then syntax error has been raised. e.g missing some step, or using wrong symbol in flowchart.

Q25. When does runtime error can occur in your flowchart or algorithm?

When your algorithm or flowcharts behave unexpectedly during their execution then runtime error will occur. e.g value divide by zero.

Q26. State logical error and how it is difficult to find it.

Logical errors are mistake in your logic when writing an algorithm or flow chart. It is difficult to find because algorithm still run but does not produce correct answer.

Q27. List the debugging techniques.

Here are common debugging techniques:

Trace the steps, use comments, check conditions, and simplify the problem

Q28. List and explain two debugging techniques.

Trace the steps: Go through each step of your algorithm or flowchart to find mistakes.

Check condition: Ensure that all conditions in decision steps are correct.

Q29. List the some common errors message in LARP.

Some common error messages are missing step, undefined variable and invalid operation.

Q30. Write a pseudocode to find the maximum number of two numbers.

```
START
        WRITE" Enter Two Numbers"
        READ A,B
        IF A > B THEN
                WRITE A
        ELSE
                WRITE B
        ENDIF
END
```