Computer Programming Concepts

(390)

STATE 2025

CONCEPT KNOWLEDGE:

Multiple Choice (50 @ 2 points each) _____ (100 points)

Test Time: 60 minutes

Multiple Choice Questions
Directions*:* Identify the letter of the choice that best completes the statement or answers the question.

1. In programming, what is a semantic error?
   A. An error that occurs when there is an issue with the syntax of the code.
   B. An error that occurs when the program runs without crashing but produces the wrong result.
   C. An error that prevents the program from running.
   D. An error related to the logic or algorithm used in the program.

2. What is the use of the ALTER TABLE statement in SQL?
   A. To change the data type of a column in a table.
   B. To add, delete, or modify columns in an existing table.
   C. To delete the entire table and its data.
   D. To change the table name.

3. In CSS, what does #id selector match?
   A. Every element of the specified id.
   B. The first element of the specified id.
   C. The unique element with the specified id.
   D. All elements that are children of the specified id.

4. How does JavaScript handle null and undefined values in comparison operations?
   A. null and undefined are equal in value.
   B. null and undefined are not equal.
   C. null is greater than undefined.
   D. null is considered to be false in all comparisons.

5. Which keyword in Java declares a constant variable?
   A. final
   B. const
   C. static
   D. immutable

6. In C programming, what does the #include <stdio.h> directive do?
   A. Includes the standard input and output library
   B. Starts the program
   C. Declares a function
   D. Initializes variables

7. How is memory management in Python primarily handled?
    A. Manual Garbage Collection
    B. Automatic Garbage Collection
    C. Using the free keyword
    D. By the programmer using pointers

8. What does the new keyword do in JavaScript?
    A. Creates a new variable
    B. Declares a new function
    C. Creates a new object instance
    D. Initializes a new array

9. In a CSS file, what does font-size: 12px; do?
    A. Changes the font color to #121212
    B. Sets the size of the font to 12 points
    C. Sets the size of the font to 12 pixels
    D. Changes the font style to pixelated

10. What is a characteristic of functional programming?
    A. Stateful operations
    B. Object inheritance
    C. Pure functions
    D. Class-based design

11. In SQL, what is the purpose of the HAVING clause?
    A. To specify a search condition for a group or an aggregate
    B. To specify a search condition for the columns retrieved
    C. To add or modify columns in a table
    D. To delete rows from a table based on a condition

12. In Python, what does the del keyword do?
    A. Deletes variables, lists, or parts of a list
    B. Declares a new variable
    C. Removes all variables from the current namespace
    D. Defines a delegate function

13. What does the protected access modifier do in Java?
    A. Allows access from any class
    B. Restricts access to the same package and subclasses
    C. Restricts access to the same class only
    D. Allows access only from within the same class and its subclasses in any package

14. Which HTML element is used for writing JavaScript code?
    A. <script>
    B. <js>
    C. <javascript>
    D. <code>

15. What does the && operator return in JavaScript when used with non-boolean values?
    A. true if both values are true
    B. false if either value is false
    C. The first falsy value or the last value if none are found
    D. An error

16. What principle does the acronym DRY stand for in software development?
    A. Do Reuse Your code
    B. Don't Repeat Yourself
    C. Debug and Refactor Yourself
    D. Data Rendering Yearly

17. In Git, what command is used to create a copy of an existing repository?
    A. git clone
    B. git copy
    C. git fork
    D. git duplicate

18. Which of the following is a mutable data type in Python?
    A. Tuple
    B. String
    C. List
    D. Integer

19. In CSS, what property is used to set the background color of an element?
    A. color
    B. background-color
    C. bgcolor
    D. background-style

20. What is the main use of the throw keyword in Java?
    A. To discard an object
    B. To exit a method
    C. To create a new thread
    D. To throw an exception

21. What is the output of the following Python code snippet? print(8 // 3)
    A. 2.67
    B. 2
    C. 3
    D. 2.66

22. In HTML, which attribute is used to specify the URL in an <a> tag?
    A. href
    B. src
    C. url
    D. link

23. In programming, what is a loop invariant?
    A. A condition that is true at the beginning of every iteration of the loop
    B. A variable that cannot be changed inside the loop
    C. The maximum number of iterations a loop can perform
    D. A special type of loop that runs indefinitely

24. How do you comment multiple lines in C/C++?
    A. Using // at the beginning of each line
    B. Using /* to start the comment and */ to end it
    C. Using <!-- and -->
    D. Using # at the beginning of each line

25. What does the assert statement do in Python?
    A. Compares two values for equality.
    B. Ensures that a condition is true.
    C. Declares a variable.
    D. Checks for errors in the current script.

26. Which of the following is true about static methods in Java?
    A. They can be called on instances of a class.
    B. They are called on the class itself, not on instances of the class.
    C. They cannot access class variables.
    D. They override methods in a superclass.

27. In web development, what is the purpose of AJAX?
    A. To create asynchronous web applications.
    B. To increase server processing time.
    C. To reduce website security.
    D. To simplify the syntax of JavaScript.

28. What does the float function do in Python?
    A. Converts a string or a number to a floating point number.
    B. Rounds a floating point number to the nearest integer.
    C. Sets the precision of floating point numbers.
    D. Creates a floating action button.

29. Which command is used to remove changes from the working directory in Git?
    A. git reset
    B. git revert
    C. git remove
    D. git clean

30. What is the output of the following JavaScript code? console.log(typeof null);
    A. null
    B. object
    C. undefined
    D. type

31. In CSS, what is the difference between the visibility: hidden; and display: none; properties?
    A. visibility: hidden; removes the element from the document, display: none; makes it invisible.
    B. There is no difference; both hide the element from view.
    C. visibility: hidden; keeps the element in the document flow, display: none; removes it from the document flow.
    D. display: none; makes the element invisible but still clickable.

32. Which SQL statement is used to insert new data into a database?
    A. INSERT INTO
    B. ADD RECORD
    C. CREATE NEW
    D. UPDATE

33. In Java, which of the following is used to handle multiple conditions?
    A. if
    B. for
    C. switch
    D. while

34. What is the principle of "fail fast" in software development?
    A. To ensure the system fails in a safe state.
    B. To delay error handling as long as possible.
    C. To quickly return feedback if there is an error in the system.
    D. To make systems as complex as possible to test robustness.

35. How do you declare a list that contains only integers in TypeScript?
   A. let list: int[];
   B. let list: number[];
   C. int[] list = [];
   D. number[] list = [];

36. In Python, what is a lambda function?
   A. A function that is defined without a name.
   B. A function that can only be used in lambda expressions.
   C. A special method of the Lambda class.
   D. A named function that is used in high-order functions.

37. What is the main difference between == and === in JavaScript?
   A. == compares values after type coercion, === compares values without type coercion.
   B. There is no difference, both are used for equality checks.
   C. == is used for equality, while === is used for inequality.
   D. == is a strict comparison operator, while === is not.

38. In HTML, what is the purpose of the <meta> tag?
   A. To refresh the page automatically after a specified number of seconds.
   B. To specify the character set, page description, keywords, author of the document, and viewport settings.
   C. To link JavaScript and CSS files to the HTML document.
   D. To define metadata about an HTML document.

39. What is the use of decorators in Python?
   A. To modify the behavior of function or class.
   B. To decorate the Python code with comments.
   C. To add functionality to an existing code block without modifying its structure.
   D. To mark certain parts of the code for the compiler to optimize.

40. In object-oriented programming, what is composition?
   A. A way of inheriting methods from multiple classes.
   B. A design principle that models a has-a relationship between objects.
   C. The process of creating new classes from existing ones.
   D. A pattern used to simplify complex operations.

41. What does the modulus operator (%) do in most programming languages?
   A. Divides two numbers and returns the quotient.
   B. Divides two numbers and returns the remainder.
   C. Multiplies two numbers.
   D. Adds two numbers.

42. How is data stored in a JSON file?
    A. As function calls
    B. As plain text in key-value pairs
    C. In a proprietary binary format
    D. As XML

43. In CSS, how do you select an element with the id "container"?
    A. .container
    B. #container
    C. container
    D. *container*

44. What does the yield keyword do in Python?
    A. Pauses function execution and returns a value but retains enough state to enable the function to resume where it left off.
    B. Stops the execution of a function immediately.
    C. Produces a new set of values.
    D. Yields control of the current thread.

45. What does CRUD stand for in software development?
    A. Create, Read, Update, Delete
    B. Connect, Retrieve, Use, Disconnect
    C. Create, Retrieve, Upload, Download
    D. Control, Read, Update, Disconnect

46. In a UML class diagram, what does an arrow with a solid line and a closed arrowhead represent?
    A. Dependency
    B. Association
    C. Aggregation
    D. Inheritance

47. Which SQL statement is used to extract data from a database?
    A. UPDATE
    B. DELETE
    C. INSERT
    D. SELECT

48. What is the output of the following Python code snippet? for i in range (2, 5): print(i)
    A. 2, 3, 4, 5
    B. 2, 3, 4
    C. 1, 2, 3, 4
    D. 3, 4, 5

49. In software development, the term "waterfall model" is best described as:
    A. A flexible and iterative development approach
    B. A type of agile software development method
    C. A sequential design process where each phase must be completed before the next begins
    D. A database development methodology

50. Which data structure allows elements to be added or removed from both ends?
    A. Array
    B. Stack
    C. Queue
    D. Deque