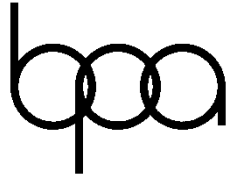


Contestant ID: _____

Time: _____

Rank: _____



**BUSINESS
PROFESSIONALS
of AMERICA**
Giving Purpose to Potential

COMPUTER PROGRAMMING CONCEPTS

(390)

REGIONAL 2026

CONCEPT KNOWLEDGE:

Multiple Choice (50 @ 2 points each)

_____ (100 points)

Test Time: 60 minutes

GENERAL GUIDELINES.

Failure to follow any of these rules may result in disqualification:

1. **Submission Requirements:** Contestants must submit this test booklet along with any printouts.
2. **Permitted Items:** Only the equipment, supplies, and materials specified for this event are allowed in the testing area. Previous BPA tests and sample tests (whether handwritten, photocopied, or typed) are not permitted.
3. **Electronic Devices:** Electronic devices will be monitored according to ACT standards.

Multiple Choice Questions

Directions: Identify the letter of the choice that best completes the statement or answers the question.

1. What is the result of $9 \% 4$ in most programming languages?
 - A. 1
 - B. 2.25
 - C. 3
 - D. 0
2. Which data structure is used to implement a recursive algorithm?
 - A. Queue
 - B. Array
 - C. Linked list
 - D. Stack
3. What is the primary purpose of a "constructor" in object-oriented programming?
 - A. To destroy an instance of a class
 - B. To update the properties of an instance
 - C. To create a new instance of a class
 - D. To monitor the performance of an instance
4. In the context of SQL, what is a "view"?
 - A. A tool for visualizing database schemas
 - B. A database optimized for updating data
 - C. A virtual table based on the result-set of an SQL statement
 - D. A security feature that restricts access to certain data
5. Which of the following is considered a referenced datatype in most languages?
 - A. String
 - B. Float
 - C. Linked list
 - D. Array
6. In object-oriented programming, what does "overloading" refer to?
 - A. Changing the way operators work with specific objects
 - B. Reusing the same variable names within different scopes
 - C. Creating multiple classes with the same name but different properties
 - D. Allowing a single function or method to have multiple signatures
7. How does a "hash table" manage collisions?
 - A. By creating a linked list for each entry within the table
 - B. By resizing the table and rehashing all entries
 - C. By storing all entries in a single, linear array
 - D. Both A and B

8. What is the primary characteristic of "immutable" objects in programming?
 - A. Their state cannot be modified after they are created
 - B. They can change state based on user actions or inputs
 - C. They can be cloned to create exact copies
 - D. They are deleted from memory once they go out of scope
9. In SQL, what is an "index"?
 - A. A tool for managing database transactions
 - B. A method for encrypting database files
 - C. A command to create new tables in the database
 - D. A database optimization technique that speeds up data retrieval operations
10. What is "refactoring" in the context of software development?
 - A. The process of adding new features to an application without changing its existing behavior
 - B. The process of debugging and fixing errors in an application
 - C. The process of altering an application's internal structure without changing its external behavior
 - D. The process of converting software from one programming language to another
11. Which of the following is NOT a principle of "Agile" software development?
 - A. Customer collaboration over contract negotiation
 - B. Responding to change over following a plan
 - C. Individual interactions over processes and tools
 - D. Comprehensive documentation
12. What does "MVC" stand for in software design patterns?
 - A. Model-View-Controller
 - B. Multiple-View-Configuration
 - C. Model-Vector-Component
 - D. Memory-Value-Cache
13. In the context of databases, what is a "transaction"?
 - A. A sequence of operations performed as a single logical unit of work
 - B. An exchange of information between different databases
 - C. A request to retrieve data from a database
 - D. A method of changing the database schema
14. What is the purpose of the finally block in Java?
 - A. To finalize objects before they are garbage collected
 - B. To execute code after a try block regardless of whether an exception was thrown or not
 - C. To declare final variables or methods
 - D. To ensure that a loop is executed at least once

15. In computer science, what is "Big O notation" used to describe?
- A. The worst-case runtime complexity of an algorithm
 - B. The encryption strength of an algorithm
 - C. The amount of memory an algorithm uses
 - D. The number of inputs an algorithm can handle
16. You have an array with 16 elements. What is the index of the last element?
- A. 16
 - B. 15
 - C. 0
 - D. 1
17. In web development, what is AJAX primarily used for?
- A. Creating asynchronous web applications that can send and receive data from a server asynchronously
 - B. Generating static web pages
 - C. Encrypting data sent over the internet
 - D. Designing user interfaces
18. What principle does the "Single Responsibility Principle" (SRP) advocate for in software development?
- A. A class should be responsible for a single part of the software's functionality, not its entirety
 - B. A software module or class should focus on a single task or functionality
 - C. Every piece of software should be responsible for its own maintenance
 - D. A class should have only one reason to change
19. In SQL, what does the HAVING clause do?
- A. Specifies which database to use
 - B. Filters records that work with aggregate functions like COUNT, AVG, MAX, MIN, SUM
 - C. Updates data in a database
 - D. Deletes data from a database
20. Which pattern in software design is typically used to reduce communication complexities between multiple objects or classes?
- A. Adapter Pattern
 - B. Singleton Pattern
 - C. Factory Pattern
 - D. Observer Pattern
21. In programming, what is "recursion"?
- A. A function that calls another function as part of its execution
 - B. A loop that executes indefinitely until stopped manually
 - C. A method of solving problems by breaking them down into smaller, manageable tasks
 - D. A function that calls itself directly

22. In the context of software version control, what is a "branch"?
- A. A duplicate of the codebase that can be developed in parallel
 - B. A previous version of the software that is maintained for legacy support
 - C. A locked version of the software for archival purposes
 - D. A bug fix applied directly to a production version of the software
23. Which SQL keyword is used to sort the result-set?
- A. GROUP BY
 - B. SORT BY
 - C. ORDER BY
 - D. ALIGN BY
24. What does the term "polymorphism" refer to in object-oriented programming?
- A. The ability to create multiple classes from a single class
 - B. The capacity to change the data type of a variable
 - C. The ability of different classes to respond to the same functionality differently
 - D. The process of wrapping data and methods into a single unit
25. Which data structure would be most efficient for implementing a browser's back button functionality?
- A. Stack
 - B. Queue
 - C. Array
 - D. LinkedList
26. In SQL, what is the difference between the INNER JOIN and OUTER JOIN keywords?
- A. INNER JOIN returns all rows from both tables, regardless of match
 - B. OUTER JOIN deletes the rows that do not match
 - C. INNER JOIN returns only the rows that match in both tables, while OUTER JOIN returns all rows
 - D. INNER JOIN modifies rows in both tables
27. How do you ensure code quality and correctness in the software development process?
- A. By using a version control system
 - B. By writing documentation
 - C. By conducting peer code reviews
 - D. By focusing solely on testing
28. What principle is demonstrated when a child class inherits all the properties and behavior of a parent class?
- A. Inheritance
 - B. Encapsulation
 - C. Abstraction
 - D. Polymorphism

29. Which of the following best describes "agile" software development?
- A. A rigid, sequential approach to software development
 - B. A flexible and iterative approach to software development
 - C. A documentation-centered software development process
 - D. A software development process that emphasizes on end-user satisfaction only
30. In a database, what is a "schema"?
- A. A query language specific to that database
 - B. A tool for visualizing database data
 - C. A protocol for database replication
 - D. A layout that defines the structure of the database
31. What does "continuous integration" mean in the context of software development?
- A. The practice of automating the deployment process
 - B. The practice of merging all developer working copies to a shared mainline several times a day
 - C. The practice of keeping code in a state where it can be released at any time
 - D. The process of testing each part of the software continuously
32. Which of the following SQL statements is used to remove data from a database?
- A. DELETE FROM
 - B. REMOVE FROM
 - C. DROP TABLE
 - D. ALTER TABLE
33. What is a "deadlock" in the context of concurrent programming?
- A. A situation where a process is waiting indefinitely for a resource that has been allocated to it
 - B. A bug that causes a program to crash unexpectedly
 - C. A type of error that occurs when incorrect data is input into a program
 - D. A situation where two or more processes are unable to proceed because each is waiting for the other
34. What is the main purpose of the software design pattern known as "Singleton"?
- A. To encapsulate a group of individual factories
 - B. To ensure a class has only one instance and provide a global point of access to it
 - C. To separate the construction of a complex object from its representation
 - D. To dynamically add functionality to an object
35. Which concept in database management prevents transactions from interfering with each other?
- A. Isolation
 - B. Normalization
 - C. Serialization
 - D. Indexing

36. In the context of version control systems, what is a "merge conflict"?
- A. An error that happens when the version control system is updated
 - B. A difference that occurs when merging branches due to changes in the same part of the file
 - C. A conflict that happens when files are deleted
 - D. A problem that arises when network access is lost during a merge
37. Which of the following programming paradigms focuses on the use of objects and classes to organize code and data?
- A. Procedure Programming
 - B. Object-Oriented Programming
 - C. Functional Programming
 - D. Logic Programming
38. In software development, what is meant by "unit testing"?
- A. Testing individual components or functions of a software for correctness
 - B. Testing the interaction between components of a software
 - C. Testing the entire system at once
 - D. Testing the user interface of the software
39. Which of the following is a characteristic of "NoSQL" databases?
- A. They are primarily relational databases
 - B. They use structured query language exclusively
 - C. They do not support storing data in tables
 - D. They are optimized for horizontal scaling
40. What is "function overloading"?
- A. Changing the output of functions based on the current time
 - B. Allowing a function to have multiple definitions with different parameters
 - C. Using a single function to perform different types of operations
 - D. Creating a function without any parameters
41. In the context of web development, what is RESTful API design?
- A. A style of software architecture for distributed systems
 - B. A set of protocols for designing network applications
 - C. A methodology for building APIs in a client-server relationship
 - D. A protocol for securing web applications
42. What role does "continuous delivery" play in software development?
- A. It ensures that software is developed in a continuous, linear fashion
 - B. It continuously monitors software for bugs and vulnerabilities
 - C. It delivers continuous feedback to developers on their code's performance
 - D. It automates the delivery of software to ensure that it can be released to production at any time

43. Which keyword in SQL is used to return only distinct (different) values?
- A. UNIQUE
 - B. DISTINCT
 - C. DIFFERENT
 - D. SEPARATE
44. In programming, what does IDE stand for?
- A. Internal Database Engine
 - B. Integrated Development Environment
 - C. Intelligent Design Engine
 - D. Integrated Debugging Environment
45. What is the result of the logical operator AND (&&) if one of the operands is false?
- A. TRUE
 - B. Null
 - C. FALSE
 - D. Undefined
46. Which data structure uses a first-in, first-out (FIFO) method?
- A. Queue
 - B. Stack
 - C. Array
 - D. LinkedList
47. What is encapsulation in object-oriented programming?
- A. The concept of combining methods and attribute into a single unit
 - B. The mechanism of hiding of data implementation by restricting access to public methods
 - C. The inheritance of parent class methods by a child class
 - D. The ability of different classes to respond to the same message in different ways
48. Which loop structure is known for executing its body at least once before checking its condition?
- A. For loop
 - B. While loop
 - C. Recursion
 - D. Do-while loop
49. What does UML stand for?
- A. Universal Markup Language
 - B. Unified Modeling Language
 - C. User Mode Linux
 - D. Unified Markup Language
50. In SQL, what is the purpose of the GROUP BY statement?
- A. To sort the result set in ascending or descending order
 - B. To aggregate rows that have the same values in specified columns into summary rows
 - C. To specify the search condition for the rows returned by the query
 - D. To insert new records into a database table