1. Which data structure is used to implement a queue?  
 A: Array  
 B: Linked List  
 C: Stack  
 D: Tree  
 Correct Answer: B  
  
2. What is the time complexity of binary search on a sorted array of size n?  
 A: O(n^2)  
 B: O(n log n)  
 C: O(log n)  
 D: O(n)  
 Correct Answer: C  
  
3. What is the purpose of a class constructor?  
 A: To initialize object data members  
 B: To handle object destruction  
 C: To provide a way to compare objects  
 D: To override inherited methods  
 Correct Answer: A  
  
4. Which of the following is NOT a feature of object-oriented programming?  
 A: Encapsulation  
 B: Polymorphism  
 C: Multiple inheritance  
 D: Functional programming  
 Correct Answer: D  
  
5. What is the difference between a local and a global variable?  
 A: Local variables are declared inside functions, while global variables are declared outside functions  
 B: Global variables are stored in RAM, while local variables are stored in registers  
 C: Local variables cannot be accessed by other functions, while global variables can be accessed by all functions  
 D: Local variables are destroyed when the function returns, while global variables persist throughout the program  
 Correct Answer: A  
  
6. What is the purpose of a pointer?  
 A: To store the address of another variable  
 B: To store the value of another variable  
 C: To reference an object in memory  
 D: To perform arithmetic operations  
 Correct Answer: A  
  
7. Which of the following is a benefit of using a debugger?  
 A: To identify errors in code  
 B: To step through code line by line  
 C: To monitor variable values  
 D: All of the above  
 Correct Answer: D  
  
8. What is the difference between a compile-time error and a runtime error?  
 A: Compile-time errors are detected before the program runs, while runtime errors are detected while the program is running  
 B: Runtime errors are more severe than compile-time errors  
 C: Compile-time errors can be fixed by modifying the code, while runtime errors cannot  
 D: None of the above  
 Correct Answer: A  
  
9. What is the purpose of a function template?  
 A: To create generic functions that can work with different data types  
 B: To reduce code duplication  
 C: To improve code performance  
 D: All of the above  
 Correct Answer: D  
  
10. Which of the following is a type of data structure?  
 A: Array  
 B: Linked List  
 C: Queue  
 D: All of the above  
 Correct Answer: D  
  
11. What is the difference between a class and a struct?  
 A: A class is a blueprint for creating objects, while a struct is a lightweight data structure  
 B: A class can have methods, while a struct cannot  
 C: A class can have multiple constructors, while a struct can only have one  
 D: All of the above  
 Correct Answer: D  
  
12. What is the purpose of a virtual function?  
 A: To allow for dynamic binding  
 B: To improve code reusability  
 C: To reduce code complexity  
 D: None of the above  
 Correct Answer: A  
  
13. Which of the following is a type of inheritance?  
 A: Single inheritance  
 B: Multiple inheritance  
 C: Hierarchical inheritance  
 D: All of the above  
 Correct Answer: D  
  
14. What is the difference between a shallow copy and a deep copy?  
 A: A shallow copy copies the reference to the data, while a deep copy copies the actual data  
 B: A deep copy is more efficient than a shallow copy  
 C: A shallow copy is faster than a deep copy  
 D: None of the above  
 Correct Answer: A  
  
15. What is the purpose of a destructor?  
 A: To release resources when an object is destroyed  
 B: To handle exceptions  
 C: To provide a way to compare objects  
 D: None of the above  
 Correct Answer: A  
  
16. Which of the following is a feature of the C++ programming language?  
 A: Object-oriented programming  
 B: Template metaprogramming  
 C: Exception handling  
 D: All of the above  
 Correct Answer: D  
  
17. What is the difference between a static and a dynamic array?  
 A: A static array has a fixed size, while a dynamic array can grow and shrink  
 B: A dynamic array is more efficient than a static array  
 C: A static array can be accessed using pointers, while a dynamic array cannot  
 D: None of the above  
 Correct Answer: A  
  
18. Which of the following is a type of sorting algorithm?  
 A: Bubble sort  
 B: Insertion sort  
 C: Merge sort  
 D: All of the above  
 Correct Answer: D  
  
19. What is the purpose of a search tree?  
 A: To store data in a hierarchical structure  
 B: To perform efficient searches  
 C: To sort data  
 D: None of the above  
 Correct Answer: B  
  
20. Which of the following is a type of graph?  
 A: Directed graph  
 B: Undirected graph  
 C: Weighted graph  
 D: All of the above  
 Correct Answer: D  
  
21. What is the purpose of a hash table?  
 A: To store data in a key-value pair  
 B: To perform fast lookups  
 C: To sort data  
 D: None of the above  
 Correct Answer: B  
  
22. Which of the following is a type of network topology?  
 A: Bus topology  
 B: Star topology  
 C: Ring topology  
 D: All of the above  
 Correct Answer: D  
  
23. What is the difference between TCP and UDP?  
 A: TCP is a connection-oriented protocol, while UDP is a connectionless protocol  
 B: TCP is more reliable than UDP  
 C: UDP is faster than TCP  
 D: All of the above  
 Correct Answer: D  
  
24. Which of the following is a type of web server?  
 A: Apache  
 B: Nginx  
 C: IIS  
 D: All of the above  
 Correct Answer: D  
  
25. What is the purpose of a database?  
 A: To store and manage data  
 B: To perform data analysis  
 C: To provide data security  
 D: All of the above  
 Correct Answer: D