Computer Science Fundamentals Quiz & Answers

This document contains the questions and correct answers for the computer science fundamentals quiz.

1. Which of the following operations on a stack data structure has a time complexity of O(1)?

Push

Search

Traversal

Delete middle element

2. What is the average case time complexity for searching in a Binary Search Tree (BST)?

O(n)

O(log n)

O(n^2)

O(1)

3. Which data structure is used by the Depth First Search (DFS) graph traversal algorithm?

Queue

Stack

Heap

Hash Table

4. What is the minimum number of edges required for a connected graph with 'n' vertices?

n

n-1

n+1

n/2

5. Which of the following sorting algorithms is not comparison-based?

Quick Sort

Merge Sort

Heap Sort

Counting Sort

6. What is the worst-case time complexity of the Quick Sort algorithm?

O(n log n)

O(n^2)

O(log n)

O(n)

7. Which SQL clause is used to rename a column in the result set of a query?

RENAME

ALTER

AS

UPDATE

8. In the context of relational databases, what is a foreign key?

The primary key of the current table.

A key that is always unique.

A key that references the primary key of another table.

A key used for indexing only.

9. Which of the following is an example of a Data Definition Language (DDL) command in SQL?

SELECT

INSERT

UPDATE

CREATE

10. Which OOP principle is primarily concerned with restricting direct access to some of an object's components?

Inheritance

Polymorphism

Abstraction

Encapsulation

11. Which normalization form is aimed at preventing partial dependencies?

First Normal Form (1NF)

Second Normal Form (2NF)

Third Normal Form (3NF)

Boyce-Codd Normal Form (BCNF)

12. In SQL, the HAVING clause is used to filter results...

Before the GROUP BY clause is applied.

After the GROUP BY clause is applied.

For sorting the final result set.

Instead of a WHERE clause.

13. Which of the following SQL commands belongs to the Data Control Language (DCL)?

GRANT

CREATE

SELECT

INSERT

14. The ability of an object to take on many forms is a core concept of which OOP principle?

Inheritance

Abstraction

Encapsulation

Polymorphism

15. In Object-Oriented Programming, the 'is a' relationship is represented by which concept?

Aggregation

Composition

Inheritance

Dependency

16. Function overloading, where multiple functions share the same name but have different parameters, is an example of what?

Run-time polymorphism

Compile-time polymorphism

Inheritance

Abstraction

17. In C++, which keyword can be used to prevent a class from being inherited?

static

abstract

final

private

18. Which of the following transport layer protocols provides reliable, connection-oriented delivery of packets?

UDP (User Datagram Protocol)

TCP (Transmission Control Protocol)

IP (Internet Protocol)

ICMP (Internet Control Message Protocol)

19. An IPv4 address consists of how many bits?

128 bits

64 bits

48 bits

32 bits

20. In the OSI model, which layer is responsible for organizing raw bit streams into frames and handling error detection?

Physical Layer

Network Layer

Data Link Layer

Transport Layer

21. The CSMA/CD (Carrier Sense Multiple Access with Collision Detection) protocol is primarily used in which networking technology?

Wi-Fi

Ethernet

Bluetooth

Satellite Communication

22. Which well-known port number is used by the Domain Name System (DNS) protocol?

80

443

21

53

23. If a cloud provider offers you a virtual server (a virtual machine) on which you can install your own operating system and applications, what service model are they providing?

Software as a Service (SaaS)

Platform as a Service (PaaS)

Infrastructure as a Service (IaaS)

Desktop as a Service (DaaS)

24. In cloud computing, the ability of the system to automatically add or remove computing resources based on demand is known as what?

Availability

Elasticity

Resilience

Portability

25. A cloud environment built and used exclusively by a single organization is an example of which deployment model?

Public Cloud

Hybrid Cloud

Community Cloud

Private Cloud

26. Which CPU scheduling algorithm is most likely to cause starvation for low-priority processes?

First-Come, First-Served (FCFS)

Round Robin

Shortest Job First (SJF)

Priority Scheduling

27. Which memory management technique breaks a process's logical address space into blocks of the same size?

Paging

Segmentation

Fixed Partitioning

Dynamic Partitioning

28. A deadlock situation requires four conditions to be met. If processes are allowed to have their resources forcibly taken away, which condition is being prevented?

Mutual Exclusion

Hold and Wait

No Preemption

Circular Wait

29. In operating systems, a state where the CPU spends more time swapping pages than executing instructions is known as:

Deadlock

Starvation

Thrashing

Fragmentation

30. Which page replacement algorithm is susceptible to Belady's Anomaly, where increasing the number of page frames results in more page faults?

LRU (Least Recently Used)

Optimal

FIFO (First-In, First-Out)

Clock give it as in text from with quations option and answer