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COMPUTER SCIENCE | MCQ SERIES

50 MCQs

Computer Science

Solved. Highlighted. Explained.

Hardware | Programming | Algorithms | OS & DBMS | Networks

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1. Computer Fundamentals

Question 1

Which component is considered the "brain" of the computer?

A. RAM

B. **CPU** ✓

C. Hard disk

D. Motherboard

Explanation: The Central Processing Unit fetches, decodes and executes instructions, performs calculations and controls the other parts of the computer.

Question 2

Which of the following is a volatile memory?

A. ROM

B. SSD

C. **RAM** ✓

D. Flash drive

Explanation: RAM loses all its contents when the power is switched off, whereas ROM, SSDs and flash drives retain data without power.

Question 3

What is the binary equivalent of the decimal number 10?

A. **1010** ✓

B. 1001

C. 1100

D. 1110

Explanation: 10 = 8 + 2, so the bits for 8 and 2 are set: 1010.

Question 4

How many bits are there in one byte?

A. 4

B. 16

C. 2

D. **8** ✓

Explanation: A byte is a group of 8 bits and is the basic unit used to represent one character.

Question 5

Which of the following is an example of system software?

A. MS Word

B. **Operating system** ✓

C. Photoshop

D. Web browser

Explanation: System software manages hardware and provides a platform for applications. An operating system such as Windows or Linux is the main example.

Question 6

Which part of the CPU performs arithmetic and logical operations?

A. **ALU** ✓

B. Control Unit

C. Register

D. Cache

Explanation: The Arithmetic Logic Unit carries out addition, subtraction, comparisons and logical operations such as AND, OR and NOT.

Question 7

Which of the following is an output device?

A. Keyboard

B. Scanner

C. **Monitor** ✓

D. Mouse

Explanation: A monitor displays results to the user. The keyboard, scanner and mouse are input devices.

Question 8

What is the full form of BIOS?

A. Basic Integrated Operating System

B. Binary Input Output Setup

C. Base Internal Output Software

D. **Basic Input/Output System** ✓

Explanation: BIOS is firmware stored on the motherboard that initialises hardware and starts the operating system when the computer boots.

Question 9

The hexadecimal digit F is equal to which decimal number?

A. 10

B. **15** ✓

C. 14

D. 16

Explanation: Hexadecimal digits run 0-9 then A-F, where A = 10 and F = 15.

Question 10

Which of the following is the fastest storage in a computer?

A. **Register** ✓

B. Hard disk

C. RAM

D. Cache memory

Explanation: Registers sit inside the CPU and are the fastest. The memory hierarchy goes registers, cache, RAM, then disk.

2. Programming & Data Structures

Question 11

Which data structure follows the LIFO (Last In, First Out) principle?

A. Queue

B. Array

C. Binary tree

D. **Stack** ✓

Explanation: In a stack, the most recently pushed element is the first one popped, like a pile of plates.

Question 12

Which data structure follows the FIFO (First In, First Out) principle?

A. Stack

B. Tree

C. **Queue** ✓

D. Graph

Explanation: A queue removes elements in the order they arrived, exactly like people waiting in line.

Question 13

A translator that converts the entire source code into machine code before execution is called a:

A. Compiler ✓

B. Interpreter

C. Assembler

D. Debugger

Explanation: A compiler translates the whole program at once and produces an executable. An interpreter translates and runs line by line.

Question 14

In Python, what is the output of `print(type(3.14))`?

A. <class 'int'>

B. **<class 'float'>** ✓

C. <class 'str'>

D. <class 'double'>

Explanation: 3.14 is a decimal number, so Python reports its type as float. Python has no separate double type.

Question 15

Which loop is guaranteed to execute its body at least once?

A. for loop

B. while loop

C. for-each loop

D. **do-while loop** ✓

Explanation: A do-while loop checks its condition after executing the body, so the body always runs at least once.

Question 16

What is the time complexity of accessing an array element by its index?

A. O(n)

B. O(log n)

C. **O(1)**

D. $O(n^2)$

Explanation: Arrays are stored contiguously, so the address of any element is computed directly. Access takes constant time.

Question 17

In object-oriented programming, a class acquiring the properties of another class is called:

A. Inheritance ✓

B. Encapsulation

C. Polymorphism

D. Abstraction

Explanation: Inheritance lets a child class reuse and extend the attributes and methods of a parent class.

Question 18

Which data structure is typically used to implement Breadth-First Search (BFS)?

A. Stack

B. **Queue** ✓

C. Heap

D. Hash table

Explanation: BFS explores nodes level by level, so it needs FIFO order. A queue provides this, while DFS uses a stack.

Question 19

In Java, which keyword prevents a class from being inherited?

A. static

B. abstract

C. **final**

D. private

Explanation: Declaring a class final means no other class can extend it. String is a well-known example.

Question 20

In a binary tree, what is the maximum number of nodes at level L (root is at level 0)?

A. $2L$

B. L^2

C. 2^{L+1}

D. 2^L ✓

Explanation: Each node has at most two children, so the number of nodes can double at every level: 1, 2, 4, 8 and so on.

3. Algorithms & Theory

Question 21

What is the worst-case time complexity of binary search?

A. O(n)

B. **O(log n)** ✓

C. O(n log n)

D. O(1)

Explanation: Binary search halves the search space at every step, so at most about log2(n) comparisons are needed.

Question 22

Which sorting algorithm uses a pivot and the divide-and-conquer approach, with O(n log n) average time?

A. **Quick sort** ✓

B. Bubble sort

C. Insertion sort

D. Selection sort

Explanation: Quick sort partitions the array around a pivot and recursively sorts both parts.

Question 23

Which algorithm finds the shortest path from a single source in a graph with non-negative edge weights?

A. Kruskal's algorithm

B. Prim's algorithm

C. **Dijkstra's algorithm** ✓

D. Depth-First Search

Explanation: Dijkstra's algorithm repeatedly picks the closest unvisited vertex. Kruskal's and Prim's build minimum spanning trees instead.

Question 24

Which of the following sorting algorithms is stable?

A. Heap sort

B. Selection sort

C. Quick sort (standard version)

D. **Merge sort** ✓

Explanation: A stable sort keeps equal elements in their original order. Merge sort guarantees this, while the others typically do not.

Question 25

What is the best-case time complexity of bubble sort with an early-exit flag?

A. O(1)

B. **O(n)** ✓

C. O(n log n)

D. $O(n^2)$

Explanation: On an already sorted array, one pass finds no swaps and the algorithm stops, which takes linear time.

Question 26

Which technique stores the results of overlapping subproblems to avoid recomputation?

A. **Dynamic programming** ✓

B. Greedy method

C. Backtracking

D. Brute force

Explanation: Dynamic programming uses memoization or tabulation, as in computing Fibonacci numbers or the knapsack problem efficiently.

Question 27

What is the average-case time complexity of searching in a hash table?

A. O(n)

B. O(log n)

C. **O(1)**

D. O(n log n)

Explanation: A good hash function maps a key directly to its bucket, so lookup takes constant time on average.

Question 28

How many edges does a complete undirected graph with n vertices have?

A. n^2

B. n - 1

C. 2n

D. **n(n - 1) / 2**

Explanation: Every pair of vertices is connected by exactly one edge, which gives n choose 2 = n(n - 1) / 2.

Question 29

Which of the following problems is NP-complete?

A. **Travelling Salesman Problem (decision version)** ✓

B. Sorting an array

C. Binary search

D. Finding the maximum element

Explanation: The decision version of the Travelling Salesman Problem is NP-complete. The other three problems are solvable in polynomial time.

Question 30

Which traversal of a Binary Search Tree visits the keys in sorted (ascending) order?

A. Preorder

B. **Inorder** ✓

C. Postorder

D. Level order

Explanation: Inorder visits left subtree, node, then right subtree. In a BST this gives keys from smallest to largest.

4. Operating Systems & Databases

Question 31

Which CPU scheduling algorithm can cause starvation of low-priority processes?

A. Round Robin

B. First Come First Served

C. **Priority scheduling (without aging)** ✓

D. Multilevel feedback with aging

Explanation: Low-priority processes may wait forever if higher-priority ones keep arriving. Aging gradually raises their priority to prevent this.

Question 32

A situation in which processes wait for each other indefinitely is called:

A. Thrashing

B. Paging

C. Spooling

D. **Deadlock** ✓

Explanation: In a deadlock, each process holds a resource while waiting for another that is held by a different process, so none can proceed.

Question 33

Which of the following is NOT a necessary condition for deadlock?

A. Mutual exclusion

B. **Preemption** ✓

C. Hold and wait

D. Circular wait

Explanation: The four Coffman conditions are mutual exclusion, hold and wait, no preemption, and circular wait. Preemption would actually prevent deadlock.

Question 34

Which memory management technique divides memory into fixed-size blocks?

A. **Paging** ✓

B. Segmentation

C. Swapping

D. Spooling

Explanation: Paging splits logical memory into pages and physical memory into frames of equal size, which avoids external fragmentation.

Question 35

Which SQL command is used to retrieve data from a database?

A. INSERT

B. UPDATE

C. DELETE

D. **SELECT** ✓

Explanation: SELECT queries one or more tables and returns the matching rows.

Question 36

Which key uniquely identifies each record in a table?

A. Foreign key

B. Index

C. **Primary key** ✓

D. View

Explanation: A primary key holds unique, non-null values and identifies each row. A foreign key links to the primary key of another table.

Question 37

In database transactions, what does the letter 'A' in ACID stand for?

A. Accuracy

B. **Atomicity** ✓

C. Availability

D. Association

Explanation: Atomicity means a transaction is all or nothing: either every operation is completed or none is applied.

Question 38

What is the main purpose of normalization in databases?

A. **To reduce redundancy and anomalies** ✓

B. To increase data redundancy

C. To speed up the hardware

D. To encrypt the data

Explanation: Normalization organises data into well-structured tables so that duplication and insert, update and delete anomalies are minimised.

Question 39

Which SQL clause is used to filter groups created by GROUP BY?

A. WHERE

B. ORDER BY

C. **HAVING** ✓

D. LIMIT

Explanation: WHERE filters individual rows before grouping, while HAVING filters the groups after aggregation, for example HAVING COUNT(*) > 5.

Question 40

In which type of kernel do most services run in user space instead of kernel space?

A. Monolithic kernel

B. Batch kernel

C. Bootstrap kernel

D. **Microkernel** ✓

Explanation: A microkernel keeps only the essential functions inside the kernel, and drivers and file systems run as user-space services.

5. Networking, Web & Security

Question 41

How many layers does the OSI reference model have?

A. 7 ✓

B. 4

C. 5

D. 8

Explanation: The seven layers are Physical, Data Link, Network, Transport, Session, Presentation and Application.

Question 42

Which protocol translates domain names into IP addresses?

A. DHCP

B. **DNS** ✓

C. FTP

D. SMTP

Explanation: The Domain Name System works like the internet's phone book, converting names such as scholareye.xyz into IP addresses.

Question 43

What is the default port number of HTTPS?

A. 80

B. 21

C. **443** ✓

D. 25

Explanation: HTTPS uses port 443. HTTP uses 80, FTP uses 21 and SMTP uses 25.

Question 44

How many bits are there in an IPv4 address?

A. 64

B. 128

C. 16

D. **32**

Explanation: An IPv4 address has 32 bits, written as four decimal numbers. IPv6 addresses have 128 bits.

Question 45

Which transport layer protocol is connection-oriented and reliable?

A. UDP

B. **TCP** ✓

C. IP

D. ICMP

Explanation: TCP sets up a connection with a handshake and uses acknowledgements and retransmission. UDP is connectionless.

Question 46

Which device connects different networks and forwards packets between them?

A. **Router** ✓

B. Hub

C. Repeater

D. Network switch

Explanation: A router works at the network layer and uses IP addresses to choose the best path between networks.

Question 47

An attack that tricks users into revealing passwords through fake emails or websites is called:

A. DDoS attack

B. SQL injection

C. Brute force attack

D. **Phishing** ✓

Explanation: Phishing relies on deception and social engineering. Always check the sender and the web address before entering credentials.

Question 48

Which language is used to structure the content of web pages?

A. CSS

B. Python

C. **HTML** ✓

D. SQL

Explanation: HyperText Markup Language defines headings, paragraphs, links and images. CSS handles the styling.

Question 49

In machine learning, which type of learning uses labeled data to train a model?

A. Unsupervised learning

B. **Supervised learning** ✓

C. Reinforcement learning

D. Self-organised learning

Explanation: Supervised learning learns from input-output pairs, such as emails labelled spam or not spam.

Question 50

Which of the following is a public-key (asymmetric) encryption algorithm?

A. **RSA** ✓

B. AES

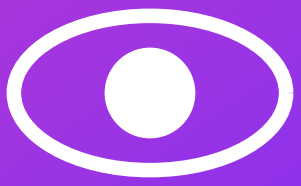
C. DES

D. MD5

Explanation: RSA uses a public key to encrypt and a private key to decrypt. AES and DES are symmetric, and MD5 is a hash function.

Quick Answer Key

1. B	11. D	21. B	31. C	41. A
2. C	12. C	22. A	32. D	42. B
3. A	13. A	23. C	33. B	43. C
4. D	14. B	24. D	34. A	44. D
5. B	15. D	25. B	35. D	45. B
6. A	16. C	26. A	36. C	46. A
7. C	17. A	27. C	37. B	47. D
8. D	18. B	28. D	38. A	48. C
9. B	19. C	29. A	39. C	49. B
10. A	20. D	30. B	40. D	50. A



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