**SQL + Python Quiz Aarthi P**

**Duration:- 60 min 24/06/2025**

**🔹 Section A: Algorithm Basics**

1. **Which of the following problems is best suited for the Greedy approach?**  
   a) 0/1 Knapsack  
   b) Matrix Chain Multiplication  
   ***c) Activity Selection Problem***d) Longest Common Subsequence
2. **Which is NOT true about the Divide and Conquer technique?**  
   a) Breaks problems into sub-problems  
   b) Merges sorted arrays  
   ***c) Suitable only for linear time solutions***  
   d) Used in Quick Sort
3. **Dynamic Programming is preferred over recursion when:**  
   a) The problem is large  
   ***b) Overlapping sub-problems exist***  
   c) Greedy fails  
   d) Time is not a constraint
4. **Brute force technique is best characterized by:**  
   a) Optimal substructure  
   b) Recursive backtracking  
   ***c) Exhaustive search***  
   d) Memoization

**🔹 Section B: Data Structures Basics**

1. **Which data structure provides constant time access to elements by index?**  
   ***a) Array***  
   b) Linked List  
   c) Stack  
   d) Queue
2. **Which of the following is not a LIFO structure?**  
   a) Call Stack  
   ***b) Queue***  
   c) Stack  
   d) Recursion
3. **Which data structure allows insertion from one end and deletion from the other?**  
   a) Stack  
   ***b) Queue***  
   c) Deque  
   d) Array

**🔹 Section C: Sorting Techniques**

1. **Which of the following sorting algorithms has the best average-case performance?**  
   a) Bubble Sort  
   b) Insertion Sort  
   ***c) Merge Sort***  
   d) Selection Sort
2. **Quick sort fails to provide O(n log n) performance when:**  
   ***a) Array is already sorted***  
   b) Median is chosen as pivot  
   c) Pivot is random  
   d) Array has duplicate values
3. **Which sorting technique is based on the concept of "divide and merge"?**  
   a) Selection Sort  
   ***b) Merge Sort***  
   c) Insertion Sort  
   d) Quick Sort

**🔹 Section D: Searching Techniques**

1. **Binary search is applicable only when:**  
   a) Data is unsorted  
   ***b) Data is sorted***  
   c) Data is in a stack  
   d) Data contains strings
2. **The time complexity of linear search is:**  
   a) O(log n)  
   b) O(1)  
   ***c) O(n)***  
   d) O(n²)

**🔹 Section E: Tree Structures**

1. **Which of the following trees maintains a balanced height after every operation?**  
   a) Binary Tree  
   ***b) AVL Tree***  
   c) BST  
   d) N-ary Tree
2. **In-order traversal of a binary search tree results in:**  
   a) Random order  
   ***b) Sorted order***  
   c) Post-order sequence  
   d) Descending order
3. **What is the maximum number of children a node can have in a Binary Tree?**  
   a) 1  
   ***b) 2***  
   c) 3  
   d) Unlimited

**🔹 Section F: Agile and Scrum**

1. **Which of the following best describes Agile?**  
   a) Waterfall methodology  
   b) A set of tools  
   ***c) Iterative and incremental development***  
   d) Traditional project management
2. **The Scrum Master is primarily responsible for:**  
   a) Managing the team’s budget  
   ***b) Coaching the team and removing impediments***c) Writing code  
   d) Assigning tasks to developers
3. **TRELLO is mostly used for:**  
   a) Coding IDE  
   b) Database Management  
   ***c) Task Tracking and Collaboration***d) Software Testing
4. **Which SDLC model emphasizes detailed documentation and minimal client interaction?**  
   a) Spiral Model  
   b) Agile Model  
   ***c) Waterfall Model***  
   d) V-Model

**🔹 Section G: Bonus Mixed Concept**

1. **Which combination is best for solving the shortest path in a weighted graph with non-negative weights?**  
   a) Brute Force + DFS  
   b) BFS + Memoization  
   ***c) Greedy + Dijkstra’s Algorithm***d) Dynamic Programming + Quick Sort

Would you like this quiz in **Word or PDF format**, or do you want **answer keys** added too?

**You said:**

i want the quiz of 70 mcq questions

**ChatGPT said:**

Updated saved memory

Great! Below is a **70-question Advanced Level Multiple-Choice Quiz** based on your topics:

**✅ Advanced Level MCQ Quiz (70 Questions)**

**Topics: Algorithm Basics, Data Structures, Sorting & Searching, Trees, Agile, Scrum, SQL (DML, Joins, Subqueries, Normalization), Python (Basics, Control Flow, OOP, Functions, Exception Handling)**

**🔹 Section 1: Algorithm Basics (Q1–10)**

1. Greedy algorithms work best when a problem exhibits:  
   a) Overlapping subproblems  
   ***b) Optimal substructure and greedy choice property***c) Backtracking  
   d) Recursion
2. Which technique is most effective for problems like Fibonacci using memoization?  
   a) Divide and Conquer  
   b) Brute Force  
   c) Greedy  
   ***d) Dynamic Programming***
3. The divide and conquer approach is used in:  
   a) Bubble Sort  
   b) Selection Sort  
   ***c) Merge Sort***d) Insertion Sort
4. Brute-force algorithm for pattern matching in text searches:  
   a) KMP Algorithm  
   b) Rabin-Karp  
   ***c) Naive Approach***d) Boyer-Moore
5. Dynamic programming approach stores:  
   a) Entire input  
   ***b) Solutions to subproblems***c) Output in trees  
   d) Search indexes
6. Which of the following problems is not suitable for greedy?  
   a) Huffman Coding  
   b) Fractional Knapsack  
   ***c) 0/1 Knapsack***d) Prim’s Algorithm
7. Divide and conquer recursively splits the problem into:  
   a) Single input  
   ***b) Sub-problems***  
   c) Non-recursive loops  
   d) Memory blocks
8. Dynamic Programming avoids:  
   ***a) Repeating subproblems***  
   b) Loop iterations  
   c) Base case solutions  
   d) Recursive steps
9. Which strategy tries all possibilities?  
   a) Dynamic  
   b) Greedy  
   c) Divide and Conquer  
   ***d) Brute Force***
10. Time complexity of Fibonacci using DP (bottom-up)?  
    a) O(n²)  
    b) O(log n)  
    ***c) O(n)***d) O(2^n)

**🔹 Section 2: Data Structures (Q11–20)**

1. Which structure uses LIFO?  
   a) Queue  
   b) Array  
   ***c) Stack***d) Linked List
2. Linked lists are preferred over arrays when:  
   a) Random access is needed  
   b) Memory is limited  
   ***c) Frequent insertions/deletions occur***d) Fixed size is needed
3. Which data structure allows insertion from both ends?  
   a) Queue  
   b) Stack  
   ***c) Deque***d) List
4. Which is best for recursion call tracking?  
   a) Queue  
   ***b) Stack***c) Tree  
   d) Heap
5. Arrays have time complexity O(1) for:  
   a) Insertion  
   b) Deletion  
   ***c) Indexing***d) Searching
6. Queue follows:  
   a) LIFO  
   b) FILO  
   ***c) FIFO***d) Circular logic
7. To implement undo in an app, use:  
   a) Array  
   b) Queue  
   ***c) Stack***d) Graph
8. Linked list traversal time complexity:  
   a) O(1)  
   ***b) O(n)***c) O(log n)  
   d) O(n log n)
9. Which structure is linear?  
   a) Tree  
   b) Graph  
   ***c) Array***d) Heap
10. Which supports priority element retrieval?  
    a) Queue  
    b) Stack  
    ***c) Priority Queue***d) Linked List

**🔹 Section 3: Sorting & Searching (Q21–30)**

1. Best case for Bubble Sort?  
   ***a) O(n)***b) O(n log n)  
   c) O(n²)  
   d) O(log n)
2. Which sort is non-comparative?  
   a) Selection  
   ***b) Radix***c) Merge  
   d) Quick
3. Binary search requires:  
   a) Hash table  
   ***b) Sorted array***c) Unsorted array  
   d) Tree
4. Which search method is linear?  
   a) Binary  
   b) Hash  
   ***c) Linear***d) B-tree
5. Quick sort worst case occurs when:  
   a) Elements are random  
   b) All elements are same  
   ***c) Already sorted***d) All options
6. Merge Sort space complexity:  
   a) O(1)  
   ***b) O(n)***c) O(log n)  
   d) O(n log n)
7. Selection sort compares elements to:  
   a) First  
   b) Middle ***c) Minimum***  
   d) Last
8. Quick sort is:  
   a) Stable  
   ***b) In-place***c) Iterative only  
   d) Heap-based
9. Which has worst case O(n²)?  
   a) Merge  
   b) Quick  
   ***c) Bubble***d) Radix
10. Which is not a comparison-based sort?  
    a) Merge  
    ***b) Radix***c) Selection  
    d) Heap

**🔹 Section 4: Trees (Q31–40)**

1. Full binary tree has:  
   ***a) All nodes with two children***b) All nodes with one child  
   c) Root only  
   d) Leaves only
2. AVL Tree ensures:  
   a) Sorted data  
   b) Duplicate entries  
   ***c) Balanced height***d) No children
3. BST right child always:  
   a) Smaller  
   ***b) Greater***c) Equal  
   d) Random
4. Pre-order traversal visits in order:  
   a) Left, Root, Right  
   ***b) Root, Left, Right***c) Left, Right, Root  
   d) Root, Right, Left
5. Which tree allows self-balancing?  
   a) BST  
   ***b) AVL***  
   c) Binary  
   d) Threaded
6. In a tree, level order traversal uses:  
   a) Stack  
   ***b) Queue***  
   c) Recursion  
   d) Array
7. Height of a tree with one node:  
   ***a) 0***b) 1  
   c) -1  
   d) Undefined
8. Inorder traversal of BST gives:  
   a) Pre-order  
   b) Reverse  
   ***c) Sorted list***d) None
9. A complete binary tree is:  
   ***a) All nodes filled***b) Height-balanced  
   c) All leaves equal level  
   d) Any binary tree
10. Number of null links in a binary tree with n nodes:  
    a) n  
    b) n-1  
    c) n+1  
    ***d) 2n***

**🔹 Section 5: Agile & Scrum (Q41–50)**

1. Agile delivers:  
   a) Final product only  
   ***b) Early and continuous delivery***c) Strict documentation  
   d) Delayed updates
2. SDLC stands for:  
   a) System Defined Life Cycle  
   b) Software Design Life Cycle  
   ***c) Software Development Life Cycle***d) Software Debug Life Cycle
3. Agile promotes:  
   a) Heavy documentation  
   b) End delivery  
   ***c) Iterative delivery***d) Zero customer interaction
4. Scrum roles include:  
   a) Product Owner, Tester  
   ***b) Developer, Scrum Master, Product Owner***c) DBA, UX  
   d) CEO
5. TRELLO is used for:  
   a) Writing Python code  
   ***b) Project collaboration***c) Database query  
   d) Test automation
6. Traditional model SDLC is:  
   a) Agile  
   ***b) Waterfall***c) Spiral  
   d) Scrum
7. Stand-up meetings in Scrum are:  
   ***a) Daily***b) Weekly  
   c) Monthly  
   d) Annually
8. Which is an Agile methodology?  
   a) Waterfall  
   b) V-Model  
   ***c) Scrum***d) Spiral
9. Sprint duration is usually:  
   a) 1 day  
   ***b) 1-4 weeks***c) 1 month  
   d) 2 months
10. Product backlog is maintained by:  
    a) Scrum Master  
    ***b) Product Owner***c) Developer  
    d) Tester

**🔹 Section 6: SQL + Python + OOP (Q51–70)**

1. SQL JOIN that returns only matching rows:  
   a) LEFT JOIN  
   b) FULL JOIN  
   ***c) INNER JOIN***d) CROSS JOIN
2. 2NF removes:  
   a) Transitive dependency  
   ***b) Partial dependency***c) Multivalued dependency  
   d) Redundancy
3. DROP TABLE removes:  
   a) Rows only  
   b) Structure only  
   ***c) Rows + Structure***d) Indexes only
4. Which clause is used for filtering?  
   a) GROUP BY  
   b) SELECT  
   ***c) WHERE***d) HAVING
5. Python default function arguments must:  
   a) Come first  
   ***b) Be last***c) Be global  
   d) Be required
6. lambda in Python is used for:  
   a) Looping  
   b) Recursion  
   ***c) Anonymous function***d) Decorators
7. Which keyword raises exceptions in Python?  
   a) throw  
   ***b) raise***c) error  
   d) except
8. Which is a Python set method?  
   a) pop()  
   b) get()  
   ***c) discard()***d) append()
9. OOP access specifier for private variable:  
   a) \_var  
   ***b) \_\_var***c) public  
   d) global
10. Polymorphism allows:  
    a) Multiple classes  
    ***b) Same function name, different behavior***c) No inheritance  
    d) One object per class
11. Self in Python represents:  
    a) A class  
    b) A method  
    ***c) The current object***d) Global variable
12. Which file mode in Python opens a file for reading only?  
    a) w  
    b) a  
    ***c) r***d) x
13. Which SQL keyword ensures non-null values?  
    a) CHECK  
    ***b) NOT NULL***c) UNIQUE  
    d) DEFAULT
14. Which SQL clause is used to group rows?  
    a) HAVING  
    ***b) GROUP BY***c) ORDER BY  
    d) SELECT
15. Function to fetch all rows in Python SQL query:  
    ***a) fetchall()***b) fetchone()  
    c) selectall()  
    d) get()
16. What is the output of type([]) in Python?  
    a) tuple  
    ***b) list***c) dict  
    d) set
17. import \* is used to:  
    a) Import selected items  
    ***b) Import all public names***c) Import nothing  
    d) Import private functions
18. Python file object’s read() method returns:  
    a) dict  
    b) list  
    ***c) string***d) int
19. SQL function to return current date:  
    ***a) GETDATE()***b) SYSDATE()  
    c) CURDATE()  
    d) NOW()
20. Python exception for invalid index:  
    a) TypeError  
    ***b) IndexError***c) NameError  
    d) ValueError