**SQL + Python Quiz**

**Duration:- 60 min**

**🔹 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