**(Q1)What is the primary property of Binary Search Tree(BST)?**

(a)Each node has at most three children (b)All value in the left are greater than the node’s value

(c)All values in right subtree are smaller than the node’s value.

(d)For any node, all values in its left subtree are smaller and all values in its right subtree are larger.✔️

**(Q2)In a Binary Serach Tree(BST), what is the time complexity of the search operation in the average case?**

(a)O(1) (b)O(log n)✔️ (c)O(n) (d)O(n log n)

**(Q3)When deleting a node with two children in a Binary Serach Tree, what is the typical procedure?**

(a)Simply remove the node (b)Replace the node with its left child

(c)Replace the node with its right child

(d)Replace the node with the minimum value in its right subtree.✔️

**(This is in-order successor,which maintains BST properties.)**

**(Q4)What is the primary purpose of balancing a Binary Serach Tree(BST)?**

(a)To minimize the height of the tree✔️ (b)To optimize the time complexity of the delete operation.

(c)To prevent memory overflow (d)To ensure all nodes are connected.

**(Q5)In an AVL tree,what is the balance factor for a node?**

(a)Height of the left subtree minus height of the right subtree.✔️

(b)Height of the right subtree minus height of the left subtree.

(c)Sum of th eheights of both subtrees.

(d)Difference between the number of nodes in both subtrees.

**(Q6)Which rotation is used when an AVL tree becomes left-heavy and the left child of the left subtree is the cause?**

(a)Right-right rotation ✔️ **(when an AVL tree becomes left-heavy due to insertion in the left subtree of the left child,it’s called a Left-left(LL) case. To fix this,a single right rotation is applied- which is also referred to as a right-right rotation in some name conventions. So while the imbalance is known a sLL case, the corrective action is a right rotation.)**

(b)Left-left rotation (c)Left-right rotation (d)Right-left rotation

**(Q7)What is the time complexity of the Breadth-First Search(BFS) algorithm in terms of the number of vertices(V) and edges(E) in a graph?**

(a)O(V) (b)O(V+E)✔️ (Each vertex and edge is processed once in BFS) (c)O€ (d)O(V\\*E)

**(Q8)In BFS, when a node is visited, what action is typically performed?**

(a)The node is marked as visited and is then added to the stack.

(b)The node is marked as visited and its unvisited neighbors are added to the queue.✔️

(c)The node is added to the visited list and ignored.

(d)The node is removed from the graph permanently.

**(Q9)Which of the following best describes the traversal order of BFS in a graph?**

(a)It explores vertices in a depth-first manner. (b)It explores vertices in layers,visited all neighbors before going deeper.✔️

(c)It explores vertices in a random order. (d)It explores vertices in a reverse order.

**(Q10)Which of the following operations can BFS be used for?**

(a)Detecting cycles in a directed graph. (b)Finding the shortest path in an unweighted graph.✔️

(c)Sorting elements in a tree. (d)Performing a depth-first traversal.