**1. Which data structure uses the Last In First Out (LIFO) principle?**

* A) Queue
* B) Stack
* C) Linked List
* D) Tree

**Answer: B) Stack**

**2. Which sorting algorithm is based on the divide and conquer strategy?**

* A) Bubble Sort
* B) Insertion Sort
* C) Merge Sort
* D) Selection Sort

**Answer: C) Merge Sort**

**3. In which data structure can elements be added or removed from both ends efficiently?**

* A) Stack
* B) Queue
* C) Deque
* D) Array

**Answer: C) Deque**

**4. Which data structure is ideal for implementing recursion?**

* A) Queue
* B) Stack
* C) Linked List
* D) Binary Tree

**Answer: B) Stack**

**5. Which data structure is used in Breadth-First Search (BFS)?**

* A) Stack
* B) Queue
* C) Priority Queue
* D) Linked List

**Answer: B) Queue**

**6. What is the primary purpose of a hash table?**

* A) Sorting elements
* B) Storing elements with a unique key
* C) Implementing a priority queue
* D) Graph traversal

**Answer: B) Storing elements with a unique key**

**7. Which data structure is used to implement a priority queue?**

* A) Array
* B) Stack
* C) Queue
* D) Heap

**Answer: D) Heap**

**8. Which of the following is a linear data structure?**

* A) Tree
* B) Graph
* C) Linked List
* D) Trie

**Answer: C) Linked List**

**9. In a binary tree, which traversal method processes nodes in the order: left subtree, root, right subtree?**

* A) Preorder
* B) Inorder
* C) Postorder
* D) Level order

**Answer: B) Inorder**

**10. Which data structure is used to implement depth-first search (DFS) in a graph?**

* A) Stack
* B) Queue
* C) Priority Queue
* D) Hash Table

**Answer: A) Stack**

**11. Which of the following is used to represent hierarchical data?**

* A) Stack
* B) Queue
* C) Tree
* D) Graph

**Answer: C) Tree**

**12. Which data structure can be used to implement a circular buffer?**

* A) Queue
* B) Stack
* C) Linked List
* D) Array

**Answer: A) Queue**

**13. Which type of linked list allows traversal in both directions?**

* A) Singly Linked List
* B) Doubly Linked List
* C) Circular Linked List
* D) Skip List

**Answer: B) Doubly Linked List**

**14. Which data structure is used for implementing a recursive function?**

* A) Queue
* B) Stack
* C) Linked List
* D) Tree

**Answer: B) Stack**

**15. Which algorithm is used to find the shortest path in a weighted graph?**

* A) Depth-First Search
* B) Breadth-First Search
* C) Dijkstra’s Algorithm
* D) Kruskal’s Algorithm

**Answer: C) Dijkstra’s Algorithm**

**16. What is the term used for a tree with no cycles and a single path between any two nodes?**

* A) Graph
* B) Forest
* C) Binary Tree
* D) Tree

**Answer: D) Tree**

**17. Which data structure is most appropriate for implementing a LRU (Least Recently Used) cache?**

* A) Stack
* B) Queue
* C) Linked List
* D) Hash Table with Doubly Linked List

**Answer: D) Hash Table with Doubly Linked List**

**18. Which algorithm is used to traverse all nodes of a graph?**

* A) Binary Search
* B) Merge Sort
* C) Breadth-First Search
* D) Quick Sort

**Answer: C) Breadth-First Search**

**19. What does a priority queue implement?**

* A) FIFO order
* B) LIFO order
* C) Elements based on priority
* D) Sorted order

**Answer: C) Elements based on priority**

**20. What data structure would you use to handle a depth-first traversal of a graph?**

* A) Queue
* B) Stack
* C) Priority Queue
* D) Linked List

**Answer: B) Stack**

**21. What is the use of a union-find data structure?**

* A) Sorting elements
* B) Finding connected components
* C) Implementing hash tables
* D) Binary search operations

**Answer: B) Finding connected components**

**22. Which type of tree has nodes with at most two children?**

* A) Binary Tree
* B) AVL Tree
* C) Red-Black Tree
* D) B-Tree

**Answer: A) Binary Tree**

**23. Which data structure can efficiently support insertion and deletion at both ends?**

* A) Array
* B) Stack
* C) Queue
* D) Deque

**Answer: D) Deque**

**24. In a binary search tree (BST), which traversal method prints nodes in ascending order?**

* A) Preorder
* B) Inorder
* C) Postorder
* D) Level order

**Answer: B) Inorder**

**25. What is a common application of a hash table?**

* A) Storing sorted elements
* B) Finding duplicates in an array
* C) Traversing a graph
* D) Implementing recursion

**Answer: B) Finding duplicates in an array**

**26. What type of data structure is used in a breadth-first search (BFS) algorithm?**

* A) Queue
* B) Stack
* C) Priority Queue
* D) Linked List

**Answer: A) Queue**

**27. What kind of linked list allows for fast access to any element in the list?**

* A) Singly Linked List
* B) Doubly Linked List
* C) Skip List
* D) Circular Linked List

**Answer: C) Skip List**

**28. Which of the following data structures is not suitable for implementing a LRU cache?**

* A) Linked List
* B) Array
* C) Hash Table
* D) Doubly Linked List

**Answer: B) Array**

**29. Which data structure is used to implement an undo functionality in applications?**

* A) Stack
* B) Queue
* C) Hash Table
* D) Linked List

**Answer: A) Stack**

**30. Which data structure can be used to implement a breadth-first traversal of a binary tree?**

* A) Stack
* B) Queue
* C) Priority Queue
* D) Hash Table

**Answer: B) Queue**