1.Which data structure allows deleting data elements from front and inserting at rear?

a. Stacks   
**b. Queues**c. Deques   
d. Binary search tree

2.Identify the data structure which allows deletions at both ends of the list but insertion at only one end.

**a. Input-restricted deque**

b. Output-restricted deque

c. Priority queues

d. None of above

3.    Which of the following data structure is non-linear type?

a. Strings

b. Lists

c.   Stacks

**d. None of above**

4.    Which of the following data structure is linear type?

a. Strings

b. Lists

c.   Queues

**d All of above**

5.    To represent hierarchical relationship between elements, which data structure is suitable?

a. Deque

b. Priority

**c.   Tree**

d. All of above

6.    A binary tree whose every node has either zero or two children is called

a. Complete binary tree

b. Binary search tree

**c.   Extended binary tree**

d. None of above

7.    The depth of a complete binary tree is given by

a. Dn = n log2n

b. Dn = n log2n+1

c.   Dn = log2n

**d. Dn = log2n+1**

8.    When representing any algebraic expression E which uses only binary operations in a 2-tree,

**a. the variable in E will appear as external nodes and operations in internal nodes**

b. the operations in E will appear as external nodes and variables in internal nodes

c.   the variables and operations in E will appear only in internal nodes

d. the variables and operations in E will appear only in external nodes

9.    A binary tree can easily be converted into q 2-tree

a. by replacing each empty sub tree by a new internal node

b. by inserting an internal nodes for non-empty node

c.   by inserting an external nodes for non-empty node

**d. by replacing each empty sub tree by a new external node**

10.  When converting binary tree into extended binary tree, all the original nodes in binary tree are

**a. internal nodes on extended tree**

b. external nodes on extended tree

c.   vanished on extended tree

d. None of above

11. The post order traversal of a binary tree is DEBFCA. Find out the pre order traversal

a. ABFCDE

b. ADBFEC

**c.   ABDECF**

d. ABDCEF

12.  Which of the following sorting algorithm is of divide-and-conquer type?

a. Bubble sort

b. Insertion sort

**c.   Quick sort**

d. All of above

13.  An algorithm that calls itself directly or indirectly is known as

a. Sub algorithm

b. Recursion

c.   Polish notation

**d. Traversal algorithm**

14.  In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called

a. Leaf

**b. branch**

c.   path

d. thread

15.  The in order traversal of tree will yield a sorted listing of elements of tree in

a. Binary trees

**b. Binary search trees**

c.   Heaps

d. None of above

16.  In a Heap tree

a. Values in a node is greater than every value in left sub tree and smaller than right sub tree

**b. Values in a node is greater than every value in children of it**

c.   Both of above conditions applies

d. None of above conditions applies

17.  In a graph if e=[u, v], Then u and v are called

a. endpoints of e

b. adjacent nodes

c.   neighbors

**d. all of above**

18.  A connected graph T without any cycles is called

**a. a tree graph**

b. free tree

c.   a tree

d. All of above

19.  In a graph if e=(u, v) means

a. u is adjacent to v but v is not adjacent to u

b. e begins at u and ends at v

c.   u is processor and v is successor

**d. both b and c**

20. If every node u in G is adjacent to every other node v in G, A graph is said to be

a. isolated

**b. complete**

c.   finite

d. strongly connected

21.The complexity of the average case of an algorithm is

A: Sometimes more complicated and some other times simpler than that of worst case

B: Much more complicated to analyze than that of worst case

**C: Much more simpler to analyze than that of worst case**

D: None of above.

22.If the sequence of operations - push(1), push(2), pop, push(1), push(2), pop, pop, pop, push(2), pop are performed on a stack, the sequence of popped out values are ?

**A: 2, 2, 1, 1, 2**

B: 2, 2, 1, 2, 2

C: 2, 1, 2, 2, 1

D: 2, 1, 2, 2, 2

23. Queue can be used to implement?

A: radix sort

**B: quick sort**

C: recursion

D: depth first search

24.

struct node{

int rollno, struct node \*next;

};

Which statement creates a new node for linked list whose structure is defined as above?

A: (int\*) malloc (sizeof(struct node))

B: (struct node\*) malloc (sizeof (struct node))

**C: (void\*) malloc (sizeof (struct node))**

D: None of Above

25. In a circularly linked list organization, insertion of a record involves the modification of

A: no pointer

B: 1 pointer

**C: 2 pointers**

D: 3 pointers

26. A binary tree in which every non-leaf node has non-empty left and right subtrees is called a strictly binary tree. Such a tree with 10 leaves

Answer Choices

A: can not have more than 19 nodes

**B: has exactly 19 nodes**

C: has exactly 17 nodes

D: can not have more than 17 nodes

27. The number of binary trees with 3 nodes which when traversed in post order gives

The sequence A, B, C is?

A: 3

B: 9

C: 7

**D: 5**

28. Given a binary search tree, which traversal type would print the values in the nodes in sorted order?

Answer Choices

A: Preorder

B: Postorder

**C: Inorder**

D: None of the above

29. Which of the following statements about binary trees is NOT true?

Answer Choices

**A: Every binary tree has at least one node.**

B: Every non-empty tree has exactly one root node.

C: Every node has at most two children.

D: Every non-root node has exactly one parent

30. An AVL tree is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Answer Choices

**A: Binary search tree with property that each node has equal difference between**

**Left and right sub tree**

B: A tree having finite member of nodes

C: A tree having single node

D: None of Above

31. Number of edges in a regular graph of tree d and n vertices is

Answer Choices

**A: Maximum of n, d**

B: n + d

C: nd

D: nd / 2

32. A null graph is defined as

Answer Choices

A: A graph having only isolated node

B: A graph having no node

**C: Graph having no edge**

D: None of the above

33. A hash table with 10 buckets with one slot per bucket is depicted in following diagram. Symbols S1 to S7 are initially entered using a hashing function with linear probing. Maximum number of comparisons needed in searching an item that is not present is

|  |  |
| --- | --- |
| 0 | S7 |
| 1 | S1 |
| 2 |  |
| 3 | S4 |
| 4 | S2 |
| 5 |  |
| 6 | S5 |
| 7 | S6 |
| 8 | S3 |
| 9 |  |

Answer Choices

A: 4

B: 5

**C: 6**

34. The average number of comparisons performed by merge sort algorithm in merging two-sorted list of length 2 is

Answer Choices

A: 8/3

**B: 8/5**

C: 11/7

D: 11/6

35. Number of swapping operations need to sort numbers 8, 22, 7, 9, 31, 19, 5, 13 in ascending order using bubble sort

Answer Choices

A: 11

B: 12

C: 13

D: 14

36. Average successful search time taken by binary search on sorted array of 10 items is

Answer Choices

A: 2.6

**B: 2.7**

C: 2.8

D: 2.9

37. Quick sort algorithm uses which technique

Answer Choices

A: Dynamic Programming

B: Bactracking

C: Greedy Method

**D: Divide and conquer**

38. Average successful search time for sequential search on ‘n’ item is

Answer Choices

A: n/2

**B: (n - 1) / 2**

C: (n + 1)/2

D: log(n) + 1

39. A full binary tree with 2n+1 nodes contain

A. n leaf nodes **B. n non-leaf nodes**

C. n-1 leaf nodes D. n-1 non-leaf nodes

40. A binary tree in which if all its levels except possibly the last, have

the maximum number of nodes and all the nodes at the last level appear as far left as possible, is known as

**A. full binary tree.** B. AVL tree.

C. threaded tree. D. complete binary tree.

41. A linear list of elements in which deletion can be done from one end

(front) and insertion can take place only at the other end (rear) is known as a

**A. queue.** B. stack.

C. tree. D. linked list.

42. A full binary tree with n leaves contains

A. n nodes. B. log n 2 nodes.

**C. 2n -1 nodes.** D. n 2 nodes.

43. The searching technique that takes O (1) time to find a data is

A. Linear Search B. Binary Search

**C. Hashing** D. Tree Search

44. You have to sort a list L consisting of a sorted list followed by a few

"random" elements. Which of the following sorting methods would be especially suitable for sucha task?

A. Bubble sort B. Selection sort

C. Quick sort **D. Insertion sort**

45. The number of interchanges required to sort 5, 1, 6, 2 4 in ascending

order using Bubble Sort is

A. 6 **B. 5**

C. 7 D. 8

46. In worst case Quick Sort has order

A. O (n log n) **B. O (n2/2)**

C. O (log n) D. O (n2/4)

47. A sort which relatively passes through a list to exchange the first

element with any element less than it and then repeats with a new first element is called

A. insertion sort. B. selection sort.

C. heap sort. **D. quick sort.**

48. Which of the following sorting algorithms does not have a worst case

running time of ( 2 ) O n ?

(A) Insertion sort **(B) Merge sort**

(C) Quick sort (D) Bubble sort

49. Which design pattern you would you use to control the creation of an object

based on a established interface,while allowing the concrete implementation to determine the subclass to construct.

Please choose only one answer:

A. Singleton design pattern

B. Builder Factory design pattern

C. Prototype factory design pattern

**D. Factory method design pattern**