Data Structures and Algorithm

(Multiple Choice Questions)

1. The memory address of the first element of an array is called:
    a. Floor address
    b. Foundation address
    c. First address
    d. *Base address*
2. The two key measures to find efficiency of an algorithm are:
    a. *Time and space*
    b. Capacity and Complexity
    c. Data and space
    d. Processor and memory
3. The space factor when determining the efficiency of algorithm is measured by:
    a. Counting the minimum memory needed by the algorithm
    b. *Counting the maximum memory needed by the algorithm*
    c. Counting the average memory needed by the algorithm
    d. Counting the maximum disk space needed by the algorithm
    e.
4. Which of the following cases does not exist in the complexity theory?
    a. Best case
    b. Worst case
    c. Average case
    d. *Null case*
5. Which of the following data structures is not linear data structure?
    a. Linked lists
    b. Array
    c. Both (a) and (b)
    d. *None of the above*
6. The operation of processing each element in the list is known as:
    a. Sorting
    b. *Traversal*
    c. Merging
    d. Inserting
7. Linked list are best suited:
    a. For relatively permanent collections of data

b. *For the size of the structure and the data in the structure are constantly changing*
c. Both (a) and (b)
d. None of the above

8. 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 such a task?
    a. Bubble sort
    b. Selection sort
    c. Quick Sort
    d. *Insertion Sort*
9. Which of the following is false?
    a. Tree is a non-linear data structure
    b. *A tree contains a cycle*
    c. A tree with n modes contains (n-1) edges
    d. A tree is a connected graph
10. Which two of the following are equivalent for an undirected graph G?
    i. G is a tree
    ii. There is atleast one path between any two distinct vertices of G
    iii. G contains no cycles and has (n-1) edges
    iv. G has n edges
    a. (i) and (ii)
    b. *(i) and (iii)*
    c. (i) and (iv)
    d. (ii) and (iii)
11. Queue is a ……..list
    a. LIFO
    b. LILO
    c. FILO
    d. *FIFO*
12. In a circular linked list
    a. Components are linked in random manner
    b. *There is no beginning and no end*
    c. Components are arranged hierarchically
    d. Forward and backward traversal within the list is permitted
13. If (rear = maxsize -1) rear =0; else rear = rear +1; is required in
    a. *Circular queue*

b. Stack
c. Linear queue
d. Link list

14. The maximum degree of any vertex in a simple graph with n vertices is:
    a. n+1
    b. *n-1*
    c. 2n-1
    d. n
15. The data structure required for breadth first traversal on a graph is:
    a. *Queue*
    b. Stack
    c. Array
    d. Tree
16. The quick sort algorithm exploit ……design technique
    a. Greedy
    b. Dynamic programming
    c. Backtracking
    d. *Divide and conquer*
17. The data structure required to evaluate a postfix expression
    a. Queue
    b. *Stack*
    c. Array
    d. Linked list
18. Preorder is also known as
    a. *Depth first order*
    b. Breadth first order
    c. Topological order
    d. Linear order
19. The data structure required to check whether expression contains balanced parenthesis is
    a. Queue
    b. Array
    c. Tree
    d. *stack*
20. Which of the following data structure is most efficient in terms of both space and time to reverse a string of characters?
    a. Linked list

b. *Stack*
c. Array
d. tree

21. If a 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
22. Which of the following is useful in implementing quick sort?
    a. Recursion
    b. Breadth first search
    c. Depth first search
    d. *Both (a) and (c)*
23. How many elements are present in the root of the tree?
    a. *1*
    b. 3
    c. 2
    d. 4
24. A linear collection of data, where element is given by means of a pointer, is called
    a. *Linked list*
    b. Primitive list
    c. Code list
    d. None of these
25. Which of the following is true for walk in a graph?
    a. Edges are not repeated
    b. *Edges may be repeated*
    c. All nodes may be covered
    d. None of the above
26. In what tree, for every node the height of its left subtree and right subtree differ atleast by one?
    a. Binary search tree
    b. *AVL tree*
    c. Threaded binary tree
    d. Complete tree

27. A graph is a tree, if and only if it
    a. Is completely connected
    b. *Is minimally connected*
    c. Contains a circuit
    d. Is planar
28. In any undirected graph, the sum of degrees of all the nodes
    a. Must be even
    b. *Are twice the number of edges*
    c. Must be odd
    d. Need not even
29. A graph in which all nodes are of equal degree is called
    a. Multi graph
    b. Non-regular graph
    c. *Regular graph*
    d. Complete graph
30. A simple graph in which there exists an edge between every pair of vertices is called
    a. *Complete graph*
    b. Euler graph
    c. Planar graph
    d. Regular graph
31. Two isomorphic graphs must have
    a. Equal no. of vertices
    b. Same no. of edges
    c. Same no. of vertices
    d. *All of the above*
32. Stack is a:
    a. FIFO
    b. *LIFO*
    c. LILO
    d. LIFO
33. In ....., the elements must be in sorted order
    a. Linear search
    b. Quick sort
    c. *binary search*
    d. selection sort
34. The structure which is best suited for hierarchical relationship is*:*

a. circular queue
b. *tree*
c. graph
d. stack

35.Which of the following require extra memory for storage:
a. *Linked list*
b. Array
c. Both (a) & (b)
d. None of the above

36.In which of the following link field of last node point to the first node
a. singly linked list
b. doubly linked list
c. singly circular linked list
d. *both (a) and (c)*

37.In which traversal root node in visited at the last
a. *Post-order traversal*
b. Pre-order traversal
c. In-order traversal
d. None

38..... is a condition when there is no space to insert an element
a. underflow
b. houseful
c. memory-full
d. *overflow*

39.Which data structure is used to implement a recursive function call?
a. linked list
b. binary tree
c. *stack*
d. queue

40..... is the process of arranging the elements of a particular data structure in some logical order.
a. Merging
b. Insertion
c. traversing
d. *Sorting*