DS MCQs for ATKT students-CBGS, CBCGS

1. Identify the data structure which allows insertion at both the ends and deletion from one end.
    a. Priority Queue.
    b. Input Restricted Double Ended Queue.
    c. **Output Restricted Double Ended Queue.**
    d. None of the above.
2. To represent hierarchical relationship between elements, which data structures should be used?
    a. Priority Queue.
    b. Double Ended Queue.
    c. **Tree**
    d. All of the above.
3. A binary tree with all the nodes having either 2 children or 0 children is called as
    a. **Complete binary tree.**
    b. Extended tree.
    c. Binary Search tree.
    d. All of the above.
4. What should be the value of rear (end) if the queue is full (elements are completely occupied)?
    a. -1
    b. 0
    c. **Max-1**
    d. Max+1
5. If the Stack is implement using linked list, where push operation will take place?
    a. At the end
    b. **At the beginning**
    c. Anywhere
    d. None of the above.
6. If the queue is implemented using a linked list, the element will be deleted from
    a. **Beginning**
    b. End
    c. Anywhere you want
    d. None of the above
7. When converting binary tree into an extended binary tree, all the original nodes in the binary tree are
    a. **Internal nodes on extended tree**
    b. External nodes on extended tree
    c. Gets vanished.
    d. None of the above.
8. In a binary tree, certain null entries are replaced by special pointers which points to the nodes higher in the tree for efficiency. These special trees are called as
    a. Expression trees.
    b. **Threaded binary trees.**

c. Extended binary trees.
d. None of the above.

9. The graph can be represented as ---- in a computer memory.
    a. An adjacency matrix
    b. An adjacency list
    c. **Both a and b.**
    d. None of the above.
10. In DFS …… data structure is used.
    a. Stack
    b. **Queue**
    c. Both a and b
    d. None of the above.
11. How the elements with the same priority get processed according to the Priority Queue mechanism? **(2 M)**
    a. Before the processing of other elements with lower priority
    b. After the processing of other elements with highest priority
    c. **On the basis of 'First-Come-First Served' priority**
    d. None of the Above
12. Stacks do not find their applicability for _____
    a. Simplification of an arithmetic expression in postfix form
    b. Recursion Implementation
    c. Conversion of Infix to its equivalent Postfix Form
    d. **Allocation of Resources by an Operating System**
13. The selected keys in the Quicksort are called as
    a. **Pivot keys**
    b. Branch keys
    c. Partition keys
    d. None of the above
14. For an array of length N, how many times a swap function of Insertion sort will be called? **(2 M)**
    a. N times
    b. **N-1 times**
    c. Log N times
    d. N^2 times.
15. For searching an element in the already sorted elements, use of ……. searching method is efficient.
    a. Linear search
    b. **Binary search**
    c. Interpolation search
    d. None of the above
16. Which is the correct algorithmic sequence for the conversion of an expression from Infix to Prefix? **(2M)**

A. Change of every '(' (opening bracket) by ')' (closing bracket) and vice-versa.

B. Reversal of an infix expression.

C. Conversion of the modified expression into postfix form.

D. Reversal of postfix expression.

a. A, B, C, D
b. C, A, D, B
c. **B ,A, C, D**
d. D, B, A, C

17. Which balance factor is stored in the new field introduced by an AVL tree for the representation of a node? What are the expected values for the same?**(2M)**
    a. Length,(+1,0,-1)
    b. **Height, (+1,0,-1)**
    c. Width, (+1,0,-1)
    d. Information, (+1,0,-1)
18. How is an insertion of a node into an AVL tree carried out?
    a. By treating an AVL tree as binary search tree/
    b. By updating the balance factors working upward from insertion point to the root
    c. **Both a & b**
    d. None of the Above
19. Which is the correct sequential order of constructing a binary tree for the expression a + b * c + d * e ? **(2M)**

    A. Moving the operator at the center of the group.

    B. Inversion of the Structure.

    C. Grouping of elements as per the sequence of Evaluation.

    a. A,B,C
    b. B,C,A
    c. B,A,C
    d. **C,A,B**
20. If ' h ' is a hashing function and it is used to hash ' n ' keys into a table of size ' m ' where n <= m. What is the expected number of collisions involving a particular key ' x ' ?
    a. **less than 1.**
    b. less than n.
    c. less than
    d. less than n/2
21. One difference between a queue and a stack is:
    a. Queues require dynamic memory, but stacks do not.
    b. Stacks require dynamic memory, but queues do not.
    c. **Queues use two ends of the structure; stacks use only one.**
    d. Stacks use two ends of the structure, queues use only one.
22. What is the value of the postfix expression 6 3 2 4 + - *:
    a. **Something between -15 and -100**
    b. Something between -5 and -15

c. Something between 5 and -5
d. Something between 5 and 15
e. Something between 15 and 100

23. Which graph representation allows the most efficient determination of the existence of a particular edge in a graph?
    a. **An adjacency matrix.**
    b. Edge lists.
24. Suppose that a selection sort of 100 items has completed 42 iterations of the main loop. How many items are now guaranteed to be in their final spot (never to be moved again)?
    a. 21
    b. 41
    c. **42**
    d. 43
25. Mergesort makes two recursive calls. Which statement is true after these recursive calls finish, but before the merge step?
    a. the array elements form a heap.
    b. **Elements in each half of the array are sorted amongst themselves.**
    c. Elements in the first half of the array are less than or equal to elements in the second half of the array.
    d. None of the above.