Data Structures

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1. Which of the following applications may use a stack?
a) A parentheses balancing program
b) Tracking of local variables at run time
c) Compiler Syntax Analyzer
d) All of the mentioned
Answer- d

2.What is the value of the postfix expression 6 3 2 4 + – *
a) Something between -5 and -15
b) Something between 5 and -5
c) Something between 5 and 15
d) Something between 15 and 100
Answer- d

3.Consider the usual algorithm for determining whether a sequence of parentheses is balanced. The maximum number of parentheses that appear on the stack AT ANY ONE TIME when the algorithm analyzes: (()(())(())) are:
a) 1
b) 2
c) 3
d) 4 or more
Answer- c

4.Pushing an element into stack already having five elements and stack size of 5 , then stack becomes
a) Overflow
b) Crash
c) Underflow
d) User flow
Answer- a

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5. Which of the following is not the type of queue?
a) Ordinary queue
b) Single ended queue
c) Circular queue
d) Priority queue
Answer- b

6.What is a memory efficient double linked list?
a) Each node has only one pointer to traverse the list back and forth
b) The list has breakpoints for faster traversal
c) An auxiliary singly linked list acts as a helper list to traverse through the doubly linked list
d) None of the mentioned
Answer- a

7. In a circular queue, how do you increment the rear end of the queue?
a) rear++
b) (rear+1) % CAPACITY
c) (rear % CAPACITY)+1
d) rear–
Answer- b

8.What is the time complexity of enqueue operation?
a) O(logn)
b) O(nlogn)
c) O(n)
d) O(1)
Answer- d

9.What does the following piece of code do?

```
public Object function()
{
    if(isEmpty())
    return -999;
    else
    {
        Object high;
        high = q[front];
        return high;
    }
}
```

a) Dequeue
b) Enqueue
c) Return the front element
d) None of the mentioned
Answer- c

10.What is the space complexity of a linear queue having n elements?
a) O(n)
b) O(nlogn)
c) O(logn)
d) O(1)
Answer- a

11.What is a dynamic array?
a) A variable size data structure
b) An array which is created at runtime
c) The memory to the array is allocated at runtime
d) An array which is reallocated everytime whenever new elements have to be added
Answer- a

12. What is a full binary tree?
a) Each node has exactly zero or two children
b) Each node has exactly two children
c) All the leaves are at the same level
d) Each node has exactly one or two children
Answer- a

13.A binary tree has 20 nodes. Then how many null branches have the tree?
a) 19
b) 20
c) 21
d) 40
Answer- c

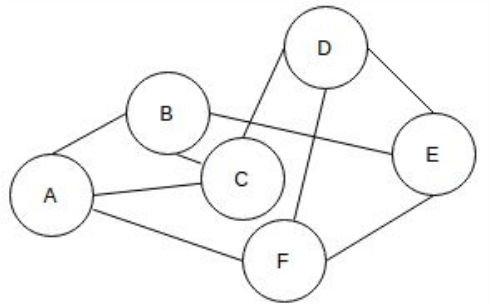
14.To restore the AVL property after inserting a element, we start at the insertion point and move towards root of that tree. is this statement true?
a) true
b) false
Answer- a

15.A connected planar graph having 6 vertices, 7 edges contains _____ regions.
a) 15
b) 3
c) 1
d) 11
Answer- b

16.If several elements are competing for the same bucket in the hash table, what is it called?
a) Diffusion
b) Replication
c) Collision
d) None of the mentioned
Answer- c

17.What is a hash function?
a) A function has allocated memory to keys
b) A function that computes the location of the key in the array
c) A function that creates an array
d) None of the mentioned
Answer- b

18.The given Graph is regular.



a) True
b) False
Answer- a

19.What is the worst case complexity of selection sort?
a) O(nlogn)
b) O(logn)
c) O(n)
d) $O(n^2)$
Answer: d

20.What is the best case complexity of selection sort?
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b) O(logn)
c) O(n)
d) $O(n^2)$
Answer: d

21.What is an internal sorting algorithm?
a) Algorithm that uses tape or disk during the sort
b) Algorithm that uses main memory during the sort
c) Algorithm that involves swapping
d) Algorithm that are considered ‘in place’
Answer: b

22.The given array is arr = {1,2,4,3}. Bubble sort is used to sort the array elements. How many iterations will be done to sort the array?
a) 4
b) 2
c) 1
d) 0
Answer: a

23.What is the worst case complexity of QuickSort?
a) O(nlogn)
b) O(logn)
c) O(n)
d) O(n^2)
Answer: d

24.The Depth First Search traversal of a graph will result into?
a) Linked List
b) Tree
c) Graph with back edges
d) None of the mentioned
Answer: b

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25. The Data structure used in standard implementation of Breadth First Search is?
a) Stack
b) Queue
c) Linked List
d) None of the mentioned
Answer: b

26.Recursion is similar to which of the following?
a) Switch Case
b) If-else
c) Loop
d) None of the mentioned
Answer: c

27.Are the following two infix expressions equivalent?
1.A+B*C
2.(A+B)*C
a)YES
b)NO
Answer: b

28.Which of the following data structure can't store the nonhomogeneous data elements?
a) Array
b) Stack
c) Records
d) None of the mentioned
Answer: a

29.The number of comparisons done by sequential search is ...
a) (N/2)+1 b)(N+1)/2
c)(N-1)/2 d)(N-2)/2
Answer: b

30.An empty list is the one which has no
a)nodes
b)data
c) both a and b
d) address

Answer: c

31.decide which of the following should be stack
a)Airplanes arriving at the airport awaiting for landing
b)The trays waiting for the use in hotel
c)Customer is waiting in a line for money in the bank
d) users of computer network sending printing files to a central printer

Answer: b

32..decide which of the following should be stack
a)Airplanes arriving at the airport awaiting for landing
b)Customer is waiting in a line for money in the bank
c) users of computer network sending printing files to a central printer
d)all of the above

Answer: d

33.The areas in which data structures are applied extensively?
a) Compiler Design,
b) Operating System,
c) Database Management System,
d) All of the above

Answer: d

34.Which of the following property does not hold for matrix multiplication?
a) Associative
b) Distributive
c) Commutative
d) None of the mentioned

Answer: c

35.What are the applications of binary search?
a) To find the lower/upper bound in an ordered sequence
b) Union of intervals
c) Debugging
d) All of the mentioned

Answer: d

36.Binary Search can be categorized into which of the following?
a) Brute Force technique
b) Divide and conquer
c) Greedy algorithm
d) Dynamic programming
Answer: b

37.Given an array arr = {5,6,77,88,99} and key = 88; How many iterations are done until the element is found?
a) 2
b) 3
c) 4
d) 1
Answer: a

38.A graph having an edge from each vertex to every other vertex is called a _____
a) Tightly Connected
b) Strongly Connected
c) Weakly Connected
d) Loosely Connected
Answer: a

39.All Graphs have unique representation on paper.
a) True
b) False
Answer: b

40.What is the maximum number of edges present in a simple directed graph with 7 vertices if there exists no cycles in the graph?
a) 21
b) 7
c) 6
d) 49
Answer: c