

1.
In a linear search algorithm, worst case occurs:

- A. If the key element is exist at first position in the list.
- B. If the key element is exist at last position in the list.
- C. If the key element does not exist in the list.
- D. If the key element either exist at last position or does not exist in the list.

Answer: D

2.
Best case time complexity of a binary search algorithm is.....

- A. $O(1)$
- B. $\text{Big Omega}(1)$
- C. $\text{Big Theta}(1)$
- D. $\text{Big Omega}(\log n)$

Answer: B

3.
What is an average case time complexity of linear search algorithm?

- A. $O(n/2)$
- B. $O(n)$
- C. Both A & B
- D. None of the above

Answer: B

4.
What is an asymptotic lower bound for binary search algorithm?

- A. Big Omega(n)
- B. Big Omega($\log n$)
- C. Big Theta($\log n$)
- D. Big Theta(n)

Answer: B

5.
Which of the following algorithm cannot be applied on a linked list data structure?

- A. Linear Search
- B. Selection Sort
- C. Bubble Sort
- D. Binary Search

Answer: D

6.
Which of the following sorting algorithm is an efficient on linked list data structure?

- A. Selection Sort
- B. Heap Sort
- C. Merge Sort
- D. Quick Sort
- E. None of the above

Answer: C

7.

Which sorting algorithm is not inplace?

- A. Selection Sort
- B. Insertion Sort
- C. Merge Sort
- D. Quick Sort

Answer: C

8.

Which of the following sorting algorithm works efficiently for already sorted input sequence?

- A. Selection Sort
- B. Insertion Sort
- C. Bubble Sort
- D. Merge Sort

Answer: B

9.

In which sorting algorithm elements which are at consecutive positions gets compared?

- A. Selection Sort
- B. Bubble Sort
- C. Insertion Sort
- D. Merge Sort

Answer: B

10.

Which of the following algorithm do not follows divide-and-conquer strategy?

- A. Merge Sort
- B. Quick Sort
- C. Insertion Sort
- D. Binary Search

Answer: C

11.

In which of the following sorting algorithm magnitudes of time complexities in all cases is same?

- A. Selection Sort
- B. Insertion Sort
- C. Quick Sort
- D. Merge Sort
- E. Both A & D

Answer: E

12.

_____ algorithm is an efficient algorithm to sort smaller input size array.

- A. Quick Sort
- B. Merge Sort
- C. Insertion Sort
- D. Bubble Sort

Answer: C

13.

In binary search algorithm after every iteration search space is reduced by

- A. n
- B. $n-1$
- C. $n/2$
- D. $2n$

Answer: C

14.

On which of the following data structure searching operation cannot be applied

- A. Binary Search Tree
- B. Graph
- C. Hash Table
- D. Queue

Answer: D

15.

_____ algorithm cannot be applied on a linked list

- A. Merge Sort
- B. Quick Sort
- C. Insertion Sort
- D. Selection Sort

Answer: B

1.

Is it possible to implement two stacks in an array?
Condition: None of the stack should indicate an overflow until every slot of an array is used.

- A. Only 1 stack can be implemented for given condition
- B. Stacks can not be implemented in an array
- C. 2 stacks can be implemented for the given condition
- D. 2 stacks can be implemented if the given condition is applied only for 1 stack

Answer: C

Hint: 2 stacks can be implemented for the given condition start 1st stack from left (1st position of an array at index 0 and 2nd from right (last position of an array at n-1 index) move 1st stack towards right and 2nd towards left)

2.

What is an advantage of the heap over a stack?

- A. The heap is more flexible than the stack.
- B. Because memory space for the heap can be dynamically allocated and de-allocated as needed.
- C. The memory of the heap can at times be slower when compared to that stack.
- D. A and B

Answer: D

3.

Which of the following is true about stack

- i. Stack follows a LIFO pattern and array follows FIFO
- ii. Stack follows particular order where as an array does not follow a particular order
- iii. Array can be accessed by referring to the any specific indexed element within the array
- iv. Stack can not be accessed by referring to the any specific position element within the stack

- A. ii,iv
- B. ii,iii,iv
- C. ii
- D. i

Answer: B

4.

Shop owner sells footballs. She has a large container to store footballs which is closed from below. Footballs are piled one on top of the other in the box. When new balls are supplied, shop owner puts the balls in the box from the top. When a customer buys a ball, shop owner delivers the ball at the top of the pile to the customer. Each ball has a code. shop owner wants to store the ball codes in a data structure to keep track of her inventory. Which data-structure should she use?

- A. Queue
- B. Stack
- C. Array
- D. Graph

Answer: B

Hint: The foot balls are put in the box from the top and are removed from the top. This follows the logic Last In First Out. This logic can be represented using a stack data structure.

5.

An advantage of postfix form of an expression is that

- A. There is no need to group sub-expressions in parentheses
- B. There is no need to consider operator precedence.
- C. A and B
- D. Only B

Answer: C

6.

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

Answer: A

7.

Here is an infix expression: $4+3*(6*3-12)$. Suppose that we are using the usual stack algorithm to convert the expression from infix to postfix notation. What is the maximum number of symbols that will appear on the stack AT ONE TIME during the conversion of this expression?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

Answer: D

8.

Transform the following infix expression into prefix form: $A - (((B + C) * D) - E) / F$

- A. $-A-+B*CD/EF$
- B. $-A/-*+BCDEF$
- C. $/-A-*+BCDEF$
- D. $-A-/ *+BCDEF$

Answer: B

9.

Parenthesis is not required in postfix/prefix because

- A. The order of an operators in expressions determines the actual order of operations in evaluating the expression.
- B. The priority of the operators in expressions determines the actual order of operations in evaluating the expression.
- C. A and B
- D. None of the above

Answer: A

10.

Which process places data at the back of the Queue ?

- A. dequeue
- B. enqueue
- C. traverse
- D. poll

Answer: B

11.

Linear Data Structure means

- A. where an element is always deleted from top end or front end
- B. having a linear relationship between its adjacent elements.
- C. where elements are accessed randomly
- D. which follow FIFO rule.

Answer: B

12.

Advantages of Circular Queue

- A. Memory utilization is better than linear queue
- B. A new item can be inserted in the location from where a previous item is deleted.
- C. Infinite number of elements can be added continuously but without deletion.
- D. A and B

Answer: D

13.

Searching for a given value in the queue time complexity is

- A. $O(n)$
- B. $O(1)$
- C. $O(\log n)$
- D. None of the above

Answer: A

14.

Consider the following operation along with Enqueue and Dequeue operations on queues, where k is a global parameter.

MultiDequeue(Q)

```
{  
    m = k  
    while (Q is not empty and m > 0)  
    {  
        Dequeue(Q)  
        m = m - 1  
    }  
}
```

What is the worst case time complexity of a sequence of n MultiDequeue() operations on an initially empty queue?

- A. Big $O(n)$
- B. Bin $O(n + k)$
- C. Bin $O(nk)$
- D. Bin $O(n^2)$

Answer: A

15.

Circular Queue is normally used in real life at

- A. Traffic light sequence
- B. print spooler of an operating system
- C. bottle capping systems in cold drink factory
- D. resolves bullet cylinder when place an object into two side opened container
- E. All of the above

Answer: E

16. **Circular Queue is normally used in**

- A. keystroke buffers
- B. network buffers
- C. task queues in embedded systems
- D. mouse event buffers
- E. all of the above

Answer: E

1.

A linear collection of data elements where the linear node is given by means of pointer is called?

- A. Linked list
- B. Node list
- C. Primitive list
- D. None of the above

Answer: A

2.

How do you search for a target key in a linked list?

- A. To find the target key in a linked list, you have to apply sequential search.
- B. To find the target key in a linked list, you have to apply divide and conquer algorithm.
- C. Searching element in linked list is not possible in linear way.
- D. none of this

Answer: A

3.

Using a doubly linked list helps to reverse the stack with ----- time complexity.

- A. $O(n^2)$
- B. $O(n)$
- C. $O(n-1)$
- D. $O(1)$

Answer: A

4.

Which of the following is two way lists?

- A. Grounded header list
- B. Circular header list
- C. Linked list with header and trailer nodes
- D. None of the above

Answer: D

5.

What is true about circular linked list?

- A. deletion of a node can be achieved in $O(1)$ time
- B. it can be used for an implementation of Queue.
- C. It saves time when we have to go to the first node from the last node.
- D. B,C
- E. A,B,C

Answer: E

6.

If you are working on a windows manager that allows users to cycle through windows by pressing ctrl+Tab which type of linked list will work great?

- A. Singly Linear LinkedList
- B. Circular LinkedList
- C. Doubly Linear LinkedList
- D. None of the above.

Answer: C

7.

Consider a small circular linked list. How to detect the presence of cycles in this list effectively?

- A. Keep one node as head and traverse another temp node till the end to check if its next points to head
- B. Have fast and slow pointers with the fast pointer advancing two nodes at a time and slow pointer advancing by one node at a time
- C. Cannot determine, you have to pre-define if the list contains cycles
- D. Circular linked list itself represents a cycle. So no new cycles cannot be generated

Answer: B

Hint: Advance the pointers in such a way that the fast pointer advances two nodes at a time and slow pointer advances one node at a time and check to see if at any given instant of time if the fast pointer points to slow pointer or if the fast pointer's 'next' points to the slow pointer. This is applicable for smaller lists.

8.

Real life example of Circular Doubly Linked List are

- A. Escalator
- B. Multimedia player
- C. Railway Station
- D. Booking Ticket
- E. A,B,C

Answer: E

9.

How many pointers are contained as data members in the nodes of a circular doubly linked list of integers with five nodes?

- A. 5
- B. 8
- C. 10
- D. 15

Answer: C

10.

What is time complexity of deleting a node from first position in a doubly circular linked list?

- A. $O(n)$
- B. $O(1)$
- C. $O(n+1/2)$
- D. none of the above

Answer: B

1.
Complete graph contains _____ no. of edges, if it contains "V" no. of vertices.

- A. $(V*(V+1))/2$
- B. $(V*(V-1))/2$
- C. V
- D. (V-1)

Answer: B

2.
Graph is said to be connected graph, if any vertex in it is _____ to remaining all the vertices.

- A. Adjacent
- B. Connected as well as Adjacent
- C. Connected
- D. All of the above
- E. Only C

Answer: D

3.
For a given graph G contains which V no. of vertices and E no. of edges, G1 can be referred as a subgraph of G only if:

- A. G1 contains V no. of vertices and E no. of edges exactly
- B. G1 contains V no. of vertices and less than E no. of edges
- C. G1 contains V-1 no. of vertices and more than E no. of edges
- D. G1 contains V-1 no. of vertices and E no. of edges

Answer: B

4.
Adjacency list representation of a graph can be implemented by using

- A. Linked lists of arrays
- B. Array of linked lists
- C. Linked list of linked lists
- D. Array of array

Answer: B

5.
Which of the following traversal method can be applied on a graph data structure?

- A. Depth First Search Traversal
- B. Breadth First Search Traversal
- C. Preorder Traversal
- D. Both A & B
- E. None of the above

Answer: D

6.
If the an edges in a graph are ordered pairs of vertices then such a graph is reffered as:

- A. Ordered Graph
- B. Simple Graph
- C. Cyclic Graph
- D. Di-graph

Answer: D

7.

Which of the following statement is false about graph

- A. Graph may contains zero no. of vertices and zero no. of edges
- B. Graph may contains zero no. of vertices and non-zero no. of edges
- C. Graph must contains non-zero no. of vertices and non-zero no. of edges
- D. All of the above
- E. None of the above

Answer: D

8.

All the nodes which can be accessible from any node are referred as its _____.

- A. Ancestors
- B. Descendents
- C. Followers
- D. Siblings

Answer: B

9.

_____ is also called as Binary Heap

- A. Complete Binary Tree
- B. Strictly Binary Tree
- C. Full Binary Tree
- D. All of the above
- E. None of the above

Answer: A

10.

Minimum height of the Binary Search Tree for "n" input size is:

- A. n
- B. $\log n$
- C. $n/2$
- D. None of the above

Answer: B

11.

In which of the following type of tree each node must contains exactly two no. of childs?

- A. Binary Tree
- B. Compulsory Binary Tree
- C. Strictly Binary Tree
- D. Full Binary Tree

Answer: C

12.

The best example of heirarchical data structure is

- A. Graph
- B. Tree
- C. Hash Table
- D. Direct Access Table

Answer: B

13.

_____ traversal method always visits/prints an elements in a binary search tree in a sorted order.

- A. Inorder
- B. Preorder
- C. Postorder
- D. Both A & B

Answer: A

14.

A threaded binary tree is a binary tree in which every node that does not have right child has a link to its

- A. Pre-order successor
- B. In-order successor
- C. In-order predecessor
- D. Post-order successor

Answer: B

15.

In a _____ tree key value of parent node is always greater than its childs.

- A. Complete Binary Tree
- B. Balanced Binary Search Tree
- C. Max-Heap
- D. Min-Heap
- E. All of the above

Answer: C

1.
_____ notation is used to denote best case time complexity of an algorithm.

- A. Big omega
- B. Big theta
- C. Big alpha
- D. Big Oh

Answer: A

2.
To denote asymptotic tight bound of an algorithm which of the following notation is used?

- A. Big Omega
- B. Big Theta
- C. Little Theta
- D. Big Oh

Answer: B

3.
Time required to find largest element in an array having size "n" is

- A. $O(n-1)$
- B. $O(n)$
- C. $O(n/2)$
- D. $O(1)$

Answer: B

4.

If an algorithm neither takes minimum nor maximum amount of time to complete its execution, then it is referred as

- A. Average case time complexity
- B. Moderate case time complexity
- C. Asymptotic tight case time complexity
- D. None of the above

Answer: A

5.

Mathematical way to calculate time and space complexity of an algorithm without implementation is referred as:

- A. Mathematical Analysis
- B. Functional Analysis
- C. Asymptotic Analysis
- D. All of the above
- E. None of the above

Answer: C

6.

Measures of an analysis of an algorithm is/are:

- A. Time & Speed
- B. Time & Logic
- C. Time & Space
- D. None of the above

Answer: C

7.

If an algorithm do not contains any loop or recursive function call then time complexity of such algorithm is

- A. $O(1)$
- B. $O(n)$
- C. $O(\log n)$
- D. None of the above

Answer: A

8.

Which of the following option for an arrangement of time complexities in an ascending order

- A. $O(\log n)$, $O(n)$, $O(1)$, $O(2n)$
- B. $O(1)$, $O(2n)$, $O(n)$, $O(\log n)$
- C. $O(1)$, $O(\log n)$, $O(n)$, $O(2n)$
- D. None of the above

Answer: C

9.

Efficiency of an algorithm gets decided depends on

- A. Best case running time
- B. Worst case running time
- C. Best case running time
- D. All of the above
- E. None of the above

Answer: A

10.

For an algorithms having solution by using divide-and-conquer strategy, generally time complexity is:

- A. linear
- B. logarithmic
- C. constant
- D. None of the above

Answer: B