

Q. The term Push and Pop is related to

- A. Queue**
- B. Stack**
- C. Both**
- D. None**

Answer B

Q. Stack can be implemented using _____ and _____ ?

- A. Array and Binary Tree**
- B. Linked List and Graph**
- C. Array and Linked List**
- D. Queue and Linked List**

Answer C

Q. form of access is used to add and remove nodes from a queue.

- A. LIFO, Last In First Out**
- B. FIFO, First In First Out**
- C. Both a and b**
- D. None of these**

Answer B

Q. Before deletion condition into stack has to be checked.

- A. Overflow**
- B. Underflow**
- C. Maximum elements**
- D. Existing elements**

Answer B

Q. form of access is used to add remove nodes from a stack.

- A. LIFO**
- B. FIFO**
- C. Both A and B**
- D. None of these**

Answer A

Q. Which of the following is an application of stack?

- A. finding factorial**
- B. tower of Hanoi**
- C. infix to postfix**
- D. all of the above**

Answer D

**Q. Reversing a great deal of space for each stack
in memory will**

- A. Decrease the numbers of times overflow may occur**
- B. Increase the numbers of times overflow may occur**
- C. Increase the number of times underflow may occur**
- D. Increase the number of times underflow may occur**

Answer A

Q. In the traversal we process all of a vertex's descendants before we move to an adjacent vertex.

- a. Depth Limited**
- b. With First**
- c. Breadth First**
- d. Depth First**

Answer D

Q. Which of the following is not the type of queue?

- a. Priority queue
- b. Circular queue
- c. Single ended queue
- d. Ordinary queue

Answer C

Q. Circular Queue is also known as _____

- a) Ring Buffer**
- b) Square Buffer**
- c) Rectangle Buffer**
- d) Curve Buffer**

Answer A

Q. A data structure in which elements can be inserted or deleted at/from both ends but not in the middle is?

- a) Queue**
- b) Circular queue**
- c) Dequeue**
- d) Priority queue**

Answer C

Q. In conversion from prefix to postfix using stack data-structure, if operators and operands are pushed and popped exactly once, then the run-time complexity is

- a) $O(1)$
- b) $O(n)$
- c) $O(\log n)$
- d) $O(n^2)$

Answer C

Q. In linked representation of stack the null pointer of the last node in the list signals

- A. Beginning of the stack**
- B. Bottom of the stack**
- C. Middle of the stack**
- D. In between some value**

Answer B

Q. Identify the data structure which allows deletions as per the priority.

- (a) Input-restricted deque**
- (b) Output-restricted deque**
- (c) Priority queues**
- (d) dequeue**

Answer C

Q. A circular queue is implemented using an array of size 10.

The array index starts with 0, front is 6, and rear is 9.

The insertion of next element takes place at the array index.

- a) 0
- b) 7
- c) 9
- d) 10

Answer A

Q. A normal queue, if implemented using an array of size MAX_SIZE, gets full when

- a) Rear=MAX_SIZE-1**
- b) Front=(rear+1)mod MAX_SIZE**
- c) Front=rear+1**
- d) Rear=front**

Answer A

Q. Which function is used to return the value of first element without dequeuing it?

- a) peek()
- b) typedef
- c) id
- d) none of these

Answer A

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

- (a) Input-restricted deque**
- (b) Output-restricted deque**
- (c) Priority queues**
- (d) None of above**

Answer B

Q. A null pointer of the last node in the list signals

- a) Beginning of the stack**
- b) Bottom of the stack**
- c) Middle of the stack**
- d) In between some value**

Answer B

Q. 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

Q1. A data structure in which linear sequence is maintained by pointers is known as

- (A) Array**
- (B) Stack**
- (C) Linked list**
- (D) Pointer-based data structure**

Answer C

Q2. Which of the following sorting algorithm is the slowest ?

- (A) Bubble sort**
- (B) Heap sort**
- (C) Shell sort**
- (D) Quick sort**

Answer A

Q3. Which of the following data structure can be used to represent many-to-many relation?

- (A) B-tree**
- (B) Binary tree**
- (C) Graph**
- (D) All of above**

Answer C

Q4. Which of the following statement is not true about linked lists?

- (A) Element in a linked list, if it is sorted, can be quickly searched by applying binary search technique**
- (B) Elements are not necessarily stored in contiguous locations**
- (C) Insertions and deletions can be performed efficiently as compared to arrays**
- (D) Linked list is a dynamic structure**

Answer A

Q5. A non-circular doubly linked list can best and most generally be defined as a ___

- (A) Set of elements, each with two pointers**
- (B) Set of elements chained together with pointers**
- (C) Linear sequence of elements in sequential memory locations**
- (D) Linear sequence of elements chained together with pointers**

Answer D

Q6. To create a linked structure, each node must have one member, which is -----

- (A) A pointer to the head of the list**
- (B) A pointer to NULL**
- (C) A pointer to the node type**
- (D) A reference to the element type**

Answer C

Q7. A linear list in which elements can be added or removed at either end is known as

- (A) Circular queue**
- (B) Priority queue**
- (C) Queue**
- (D) Deque**

Answer D

Q8. Which of the following data structure is more appropriate to represent a heap?

- (A) Two-dimensional array**
- (B) Doubly linked list**
- (C) Linear Array**
- (D) Linked list**

Answer C

Q9. A graph in which all vertices have equal degree is known as _____

- (A) Complete graph**
- (B) Regular graph**
- (C) Multi graph**
- (D) Simple graph**

Answer A

Q10. A graph is a tree if and only if graph is

- (A) Directed graph**
- (B) Contains no cycles**
- (C) Planar**
- (D) Completely connected**

Answer B

Q11. The elements of a linked list are stored

- (A) In a structure**
- (B) In an array**
- (C) Anywhere the computer has space for them**
- (D) In contiguous memory locations**

An e C

Q12. Which of the following data structure is required to convert arithmetic expression in infix to its equivalent postfix notation?

- (A) Queue**
- (B) Linked list**
- (C) Binary search tree**
- (D) None of above**

Answer D

**Q13. If two trees have same structure and but different node content,
then they are called ___**

- (A) Synonyms trees**
- (B) Joint trees**
- (C) Equivalent trees**
- (D) Similar trees**

Answer D

Q14. The average case complexity of quick sort for sorting n numbers is

- (A) $O(n^2)$
- (B) $O(n \log 2n)$
- (C) $O(n)$
- (D) $O(\log 2n)$

Answer B

Q15. Which of the following operation is not supported by a queue?

- (A) Inserting element at rear
- (B) Removing element from front
- (C) Removing element from middle
- (D) None of above

Answer C

Q16. Which of the following statements about a binary tree is correct?

- (A) No binary tree is both complete and full**
- (B) Every full binary tree is also a complete binary tree**
- (C) Every complete binary tree is also a full binary tree**
- (D) Every binary tree is either complete or full**

Answer B

Q17. With an array-based stack, the algorithm for push is

- (A) Increment top and add item to the new top location**
- (B) Add item to the top location and then increment top**
- (C) Return the top item and increment top**
- (D) Return the top item and decrement top**

Answer A

Q19. The best way to find an item in a sorted list implemented using an array is with ___

- (A) Direct search**
- (B) Random search**
- (C) Binary search**
- (D) Linear search**

Answer C

Q19. Which of the following data structure works on the principle of First Come First Serve?

- (A) Priority queue**
- (B) Heap**
- (C) Stack**
- (D) Queue**

Answer D

Q1. What is the worst case run-time complexity of binary search algorithm ?

- A) $O(n^2)$
- B) $O(n \log n)$
- C) $O(n^3)$
- D) $O(n)$

Answer D

**Q2. If there's no base criteria in a recursive program,
the program will**

- A) not be executed.**
- B) execute until all conditions match.**
- C) execute infinitely.**
- D) obtain progressive approach.**

Answer C

Q3. The depth of complete binary tree is given by

- A) $n = n \log_2 n$**
- B) $n = n \log_2 n + 1$**
- C) $n = \log_2 n$**
- D) $n = \log_2 n + 1$**

Answer D

**Q4. The postfix form of the expression
 $(A+B)^*(C*D-E)^*F/G$ is ?**

- A) AB+ CD*E - FG /**
- B) AB + CD* E - F **G /
- C) AB + CD* E - *F *G /
- D) AB + CDE * - * F *G /

Answer C

Q5. Which data structure is needed to convert infix notation to postfix notation?

- A) Branch**
- B) Tree**
- C) Queue**
- D) Stack**

Answer D

**Q6. One can convert a binary tree to its mirror image
by traversing it in**

- A) Inorder**
- B) Preorder**
- C) Postorder**
- D) None of the above**

Answer C

**Q7. For an undirected graph with n vertices and e edges,
the sum of degree of each vertex is equal to**

- A) $2n$
- B) $2e$
- C) $(e^2+1)/2$
- D) $(2n-1)/2$

Answer B

Q9. What would be the asymptotic time complexity to add a node at the end of singly linked list, if the pointer is initially pointing to the head of the list?

- A) $O(1)$
- B) $O(n)$
- C) $\Theta(n)$
- D) $\Theta(1)$

Answer C

Q10. Which of the following points is/are not true about Linked List data structure when it is compared with array?

- A) Arrays have better cache locality that can make them better in terms of performance**
- B) It is easy to insert and delete elements in Linked List**
- C) Random access is not allowed in a typical implementation of Linked Lists**
- D) Access of elements in linked list takes less time than compared to arrays**

Answer D

Q11. You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list ?

- A) Delete the first element**
- B) Insert a new element as a first element**
- C) Delete the last element of the list**
- D) Add a new element at the end of the list**

Answer C

Q12. From where does the insertion and deletion of elements get accomplished in Queues ?

- a. Front & Rear ends respectively
- b. Rear & Front ends respectively
- c. Only Front ends
- d. Only Rear ends

Answer B

Q13. Which graph consists of an unordered pair of vertices representing the similar edge?

- a. Directed Graph**
- b. Undirected Graph**
- c. Both a & b**
- d. None of the above**

Answer B

**Q14. Which type of Arrays are used to store the information
in a matrix form?**

- a. Multidimensional Arrays
- b. Arrays
- c. Dimensional Arrays
- d. Both A and C

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Answer A

Q1. The memory address of the first element is called ?

- (A) Floor Address**
- (B) Foundation**
- (C) First Address**
- (D) Base Address**

Answer D

**Q2. To represent hierarchical relationship between elements,
which data structure is suitable ?**

- (A) Dequeue**
- (B) Priority**
- (C) Tree**
- (D) All of the above**

Answer C

Q3. The number of nodes in a complete binary tree of level 5 is

- (A) 15**
- (B) 25**
- (C) 63**
- (D) 71**

Answer C

Q4. The time factor when determining the efficiency of algorithm is measured by

- (A) Counting microseconds**
- (B) Counting the number of key operations**
- (C) Counting the number of statements**
- (D) Counting the kilobytes of algorithm**

Answer B

Q5. 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**

Answer D

Q6. Round robin scheduling is simulated using

- (A) Stack**
- (B) Queue**
- (C) Tree**
- (D) Graph**

Answer B

Q7. An algorithm is complete if

- (A) It terminates with a solution when one exists**
- (B) It starts with a solution**
- (C) It does not terminate with a solution**
- (D) It has a loop**

Answer A

Q8. 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 these**

Answer A

Q9. Two dimensional arrays are also called ?

- (A) Matrix Array**
- (B) Table Array**
- (C) Both A and B**
- (D) None of the Above**

Answer C

Q10. Select the true statement.

- (A) Every binary tree is either complete or full**
- (B) Every complete binary tree is also a full binary tree**
- (C) Every full binary tree is also a complete binary tree**
- (D) No binary tree is both complete and full**

Answer B

Q11. Can we read a data item at any location of a list within a constant time (i.e. O(1))?

- (A) Yes**
- (B) Yes, only if the list is implemented by pointers (i.e. linked-list)**
- (C) Yes, only if the list is implemented by an array**
- (D) No, we need O(n) computation steps no matter what**

Answer C

Q12. Linked lists are not suitable data structures for which one of the following problems

- (A) Insertion sort**
- (B) Binary search**
- (C) Radix sort**
- (D) Polynomial manipulation**

Answer B

Q13. Activation record is stored on

- (A) Queue**
- (B) Stack**
- (C) Linked list**
- (D) AVL Tree**

Answer B

Q14. Which of the following data structure is non-linear type?

- (A) Strings**
- (B) Lists**
- (C) Stacks**
- (D) None of above**

Answer D

Q15. A binary search tree is a binary tree

- (A) All items in the left subtree are less than root**
- (B) All items in the right subtree are greater than or equal to the root**
- (C) Each subtree is itself a binary search tree**
- (D) All of the above**

Answer D

Q16. Two main measures for the efficiency of an algorithm are

- (A) Processor and memory**
- (B) Complexity and capacity**
- (C) Time and space**
- (D) Data and space**

Answer C

**Q17. To implement Sparse matrix dynamically,
the following data structure is used**

- (A) Trees**
- (B) Graphs**
- (C) Priority Queues**
- (D) Linked List**

Answer D

Q18. Which allows deletion at only one end of the list but allows insertion at both ends of the list?

- (A) Deque**
- (B) Circular queue**
- (C) Output restricted deque**
- (D) Input restricted deque**

Answer C

Q19. Applications of Queue are

- (A) Simulation, event driven systems**
- (B) Postfix and prefix manipulations**
- (C) Dictionary systems, polynomial manipulations**
- (D) Fixed block storage allocation, garbage collection**

Answer A

Q20. 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**

Answer C

Q3. Which of the following case does not exist in complexity theory

- a. Best case**
- b. Worst case**
- c. Average case**
- d. Null case**

Answer D

Q4. The Worst case occur in linear search algorithm when

- a. Item is somewhere in the middle of the array**
- b. Item is not in the array at all**
- c. Item is the last element in the array**
- d. Item is the last element in the array or is not there at all**

Answer D

Q5. The complexity of linear search algorithm is

- a. $O(n)$
- b. $O(\log n)$
- c. $O(n^2)$
- d. $O(n \log n)$

Answer A

Q6. Which of the following data structure is not linear data structure?

- a. Arrays**
- b. Linked lists**
- c. Both of above**
- d. None of above**

Answer D

Q7. The operation of processing each element in the list is known as

- a. Sorting**
- b. Merging**
- c. Inserting**
- d. Traversal**

Answer D

Q8. Arrays are best data structures

- a. for relatively permanent collections of data**
- b. for the size of the structure and the data
in the structure are constantly changing**
- c. for both of above situation**
- d. for none of above situation**

Answer A

Q9. Linked lists 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. for both of above situation**
- d. for none of above situation**

Answer B

Q10. Data items that cannot be divided are called as ?

- A. Group Items**
- B. Attribute and Entity**
- C. Elementary Items**
- D. File items**

Answer C

Q11. Which of the following is not an advantage of trees ?

- A. Hierarchical structure**
- B. Faster search**
- C. Router algorithms**
- D. Undo/Redo operations in a notepad**

Answer D

Q12. Entries in a stack are "ordered". What is the meaning of this statement?

- A. A collection of stacks is sortable**
- B. Stack entries may be compared with the '<' operation**
- C. The entries are stored in a linked list**
- D. There is a Sequential entry that is one by one**

Answer D

Q14. Which of the following is not an in-place sorting algorithm?

- A. Selection sort**
- B. Heap sort**
- C. Quick sort**
- D. Merge sort**

Answer D

Q15. What is the load factor?

- A. Average array size**
- B. Average key size**
- C. Average chain length**
- D. None of the mentioned**

Answer C

Q17. Which notation is used to find the complexity of an algorithm?

- a) Asymptotic Notation**
- b) Big o Notation**
- c) Omega Notation**
- d) None of these**

Answer B

Q18. Data Structure that allows fast search within an ordered sequence of elements is called?

- a) Skip list
- b) list
- c) Array
- d) None of these

Answer A

Q19. When the data structure is combined with its operation then, data structure is known as

- a) Topology**
- b) Data Structure**
- c) Abstract Data Type**
- d) None of these**

Answer C

Q20 . Omega Notation is also known as

- a) Upper Bound**
- b) Lower Bound**
- c) Minimum Bound**
- d) None of these**

Answer A

Q1. In the arrays, the smallest element of its index also known as?

- A. Lower bound**
- B. Upper bound**
- C. Range**
- D. All of the above**

Answer A

Q2. In binary search algorithm, which of the following is not required condition?

- A. The data items must be sorted**
- B. We can access to the middle element in any sub list**
- C. There should be a function to delete and/or insert elements in the list.**
- D. Number values should only be present in the list**

Answer C

Q3. Which of following is contained by the header of the linked list?

- A. The address of the first node**
- B. The address of the last node**
- C. Pointer to the last record of the actual data**
- D. Middle record of the actual data**

Answer A

Q4. Which of following is the advantage of using linked list?

- A. For relatively permanent collections of data**
- B. Linked list is more flexible it can grow and shrink easily**
- C. Less time complexity**
- D. None of the above**

Answer B

Q5. Which are the following two phases of testing of program?

- A. Best case and worst case**
- B. Space complexity and the time complexity**
- C. Validation and checking errors**
- D. Debugging and profiling**

Answer D

Q6. The applications of stack data structure is/are?

- A. Backtracking**
- B. Memory management**
- C. Arithmetic expression evaluation**
- D. All of the above**

Answer D

Q7. If we want to implement a stack using queue then how many queues are needed? Consider the situation where no other data structure like arrays, linked list is there.

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

Answer B

Q9. Which of the following data structure that contains a relationship between a pair of elements; this is not necessarily hierarchical in nature?

- A. Tree**
- B. Graph**
- C. String**
- D. None of the above**

Answer B

Q10. Which of the following is the advantage of finding maximum and minimum using the divide and conquer method instead of conditional operators?

- A. Reduce Space Complexity**
- B. For getting the consistent result**
- C. Reduce Time Complexity**
- D. All of the above**

Answer C

Q11. Which of the following method will choose when sub-problems share sub-problems?

- A. Backtracking**
- B. Greedy Method**
- C. Divide and Conquer**
- D. Dynamic Programming**

Answer D

Q12. Which of the following is the time complexity of converting a prefix notation to infix notation is?

- A. O(n) where n is the length of the equation**
- B. O(n) where n is number of operands**
- C. O(1)**
- D. O(logn) where n is length of the equation**

Answer A

Q7. A data structure in which elements can be inserted or deleted at/from both the ends but not in the middle is?le is?

- A. Queue**
- B. Circular queue**
- C. Dequeue**
- D. Priority queue**

Answer C

Q8. What would be the asymptotic time complexity to add a node at the end of singly linked list, if the pointer is initially pointing to the head of the list?

- A. $O(1)$
- B. $O(n)$
- C. $\Theta(n)$
- D. $\Theta(1)$

Answer C

Q9. Which of the following points is/are not true about Linked List data structure when it is compared with array?

- A. Arrays have better cache locality that can make them better in terms of performance**
- B. It is easy to insert and delete elements in Linked List**
- C. Random access is not allowed in a typical implementation of Linked Lists**
- D. Access of elements in linked list takes less time than compared to arrays**

Answer D

Q10. You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list?

- A. Delete the first element**
- B. Insert a new element as a first element**
- C. Delete the last element of the list**
- D. Add a new element at the end of the list**

Answer C

Q11. What is a memory efficient double linked list?

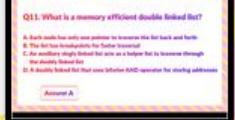
- A. Each node has only one pointer to traverse the list back and forth**
- B. The list has breakpoints for faster traversal**
- C. An auxiliary singly linked list acts as a helper list to traverse through the doubly linked list**
- D. A doubly linked list that uses bitwise AND operator for storing addresses**

Answer A

Q12. How do you calculate the pointer difference in a memory efficient double linked list?

- A. head xor tail**
- B. pointer to previous node xor pointer to next node**
- C. pointer to previous node – pointer to next node**
- D. pointer to next node – pointer to previous node**

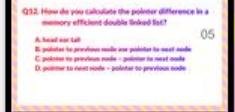
Answer B



Q12. How do you calculate the pointer difference in a memory efficient double linked list?

- A. head xor tail**
- B. pointer to previous node xor pointer to next node**
- C. pointer to previous node – pointer to next node**
- D. pointer to next node – pointer to previous node**

Answer B



Q13. Which of the following application makes use of a circular linked list?

- A. Undo operation in a text editor**
- B. Recursive function calls**
- C. Allocating CPU to resources**
- D. Implement Hash Tables**

Answer C

Q14. Array implementation of Stack is not dynamic, which of the following statements supports this argument?

- A. space allocation for array is fixed and cannot be changed during run-time**
- B. user unable to give the input for stack operations**
- C. a runtime exception halts execution**
- D. improper program compilation**

Answer A

Q15. Which of the following data structures can be used for parentheses matching?

- A. n-ary tree**
- B. queue**
- C. priority queue**
- D. stack**

Answer D

Q16. What is the time complexity of enqueue operation?

- A. O(logn)**
- B. O(nlogn)**
- C. O(n)**
- D. O(1)**

Answer D

Q15. Which of the following data structures can be used for parentheses matching?

- A. n-ary tree
- B. queue
- C. priority queue
- D. stack

Answer D

**Q17. In case of insertion into a linked queue, a node borrowed from the
_____ list is inserted in the queue.**

- A. AVAIL**
- B. FRONT**
- C. REAR**
- D. NULL**

Answer A

19. The search algorithm that requires data collection to be in sorted and equally distributed form is known to be.

- A. Linear search**
- B. Bubble search**
- C. Binary search**
- D. Interpolation search**

Answer D

Q20. A data structure named stack is an.

- A. Formal Data Type**
- B. Abstract Data Type**
- C. Absolute Data Type**
- D. Computational Data Type**