SOLVED MCQ ON DATA STRUCTURE SET-1

1. Which if the following is/are the levels of implementation of data structure

A) Abstract level

B) Application level

C) Implementation level

D) All of the above

2. A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called ……

A) AVL tree

B) Red-black tree

C) Lemma tree

D) None of the above

3. ……………….. level is where the model becomes compatible executable code

A) Abstract level

B) Application level

C) Implementation level

D) All of the above

4. Stack is also called as

A) Last in first out

B) First in last out

C) Last in last out

D) First in first out

5. Which of the following is true about the characteristics of abstract data types?

i) It exports a type.

ii) It exports a set of operations

A) True, False

B) False, True

C) True, True

D) False, False

6. …………… is not the component of the data structure.

A) Operations

B) Storage Structures

C) Algorithms

D) None of the above

7. Which of the following is not the part of ADT description?

A) Data

B) Operations

C) Both of the above

D) None of the above

8. Inserting an item into the stack when stack is not full is called …………. Operation and deletion of item form the stack, when stack is not empty is called ………..operation.

A) push, pop

B) pop, push

C) insert, delete

D) delete, insert

9. ……………. Is a pile in which items are added at one end and removed from the other.

A) Stack

B) Queue

C) List

D) None of the above

10. ………… is very useful in situation when data have to stored and then retrieved in reverse order.

A) Stack

B) Queue

C) List

D) Link list

11. Which data structure allows deleting data elements from and inserting at rear?

A) Stacks

B) Queues

C) Dequeues

D) Binary search tree

12. Which of the following data structure can't store the non-homogeneous data elements?

A) Arrays

B) Records

C) Pointers

D) Stacks

13. A ……. is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.

A) Queue linked list

B) Stacks linked list

C) Both of them

D) Neither of them

14. Which of the following is non-liner data structure?

A) Stacks

B) List

C) Strings

D) Trees

15. Herder node is used as sentinel in …..

A) Graphs

B) Stacks

C) Binary tree

D) Queues

16. Which data structure is used in breadth first search of a graph to hold nodes?

A) Stack

B) queue

C) Tree

D) Array

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

A) Input restricted dequeue

B) Output restricted qequeue

C) Priority queues

D) Stack

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

A) Strings

B) Lists

C) Stacks

D) Graph

19. Which of the following data structure is linear type?

A) Graph

B) Trees

C) Binary tree

D) Stack

20. To represent hierarchical relationship between elements, Which data structure is suitable?

A) Dequeue

B) Priority

C) Tree

D) Graph

ANSWERS:

1. D) All of the above

2. A) AVL tree

3. C) Implementation level

4. A) Last in first out

5. C) True, True

6. D) None of the above

7. D) None of the above

8. A) push, pop

9. B) Queue

10. A) Stack

11. B) Queues

12. A) Arrays ·

13. A) Queue linked list

14. D) Trees

15. C) Binary tree

16. B) queue

17. A) Input restricted dequeue

18. D) Graph

19. D) Stack

20. C) Tree

SOLVED MCQ QUESTIONS ON DATA STRUCTURE SET-2

1. A directed graph is ………………. if there is a path from each vertex to every other vertex in the digraph.
A) Weakly connected
B) Strongly Connected
C) Tightly Connected
D) Linearly Connected

2. In the ……………... traversal we process all of a vertex's descendants before we move to an adjacent vertex.
A) Depth First
B) Breadth First
C) With First
D) Depth Limited

3. State True of False.
i) Network is a graph that has weights or costs associated with it.
ii) An undirected graph which contains no cycles is called a forest.
iii) A graph is said to be complete if there is no edge between every pair of vertices.
A) True, False, True
B) True, True, False
C) True, True, True
D) False, True, True

4. Match the following.
a) Completeness   i) How long does it take to find a solution
b) Time Complexity ii) How much memory need to perform the search.
c) Space Complexity iii) Is the strategy guaranteed to find the solution when there in one.
A) a-iii, b-ii, c-i
B) a-i, b-ii, c-iii
C) a-iii, b-i, c-ii
D) a-i, b-iii, c-ii

5. 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

6. In ……………, search start at the beginning of the list and check every element in the list.
A) Linear search
B) Binary search
C) Hash Search
D) Binary Tree search

7. State True or False.
i) Binary search is used for searching in a sorted array.
ii) The time complexity of binary search is O(logn).
A) True, False
B) False, True
C) False, False
D) True, True

8. Which of the following is not the internal sort?
A) Insertion Sort
B) Bubble Sort
C) Merge Sort
D) Heap Sort

9. State True or False.
i) An undirected graph which contains no cycles is called forest.
ii) A graph is said to be complete if there is an edge between every pair of vertices.
A) True, True
B) False, True
C) False, False
D) True, False

10. A graph is said to be ……………… if the vertices can be split into two sets V1 and V2 such there are no edges between two vertices of V1 or two vertices of V2.
A) Partite
B) Bipartite
C) Rooted
D) Bisects

11. In a queue, the initial values of front pointer f rare pointer r should be …….. and ………..
respectively.
A) 0 and 1
B) 0 and -1
C) -1 and 0
D) 1 and 0

12. In a circular queue the value of r will be ..
A) r=r+1
B) r=(r+1)% [QUEUE_SIZE – 1]
C) r=(r+1)% QUEUE_SIZE
D) r=(r-1)% QUEUE_SIZE

13. Which of the following statement is true?
i) Using singly linked lists and circular list, it is not possible to traverse the list backwards.
ii) To find the predecessor, it is required to traverse the list from the first node in case of singly
linked list.
A) i-only
B) ii-only
C) Both i and ii
D) None of both

14. The advantage of …………….. is that they solve the problem if sequential storage representation.
But disadvantage in that is they are sequential lists.
A) Lists
B) Linked Lists
C) Trees
D) Queues

15. What will be the value of top, if there is a size of stack STACK_SIZE is 5
A) 5
B) 6
C) 4
D) None

16. ………… is not the operation that can be performed on queue.
A) Insertion
B) Deletion
C) Retrieval
D) Traversal

17. There is an extra element at the head of the list called a ……….
A) Antinel
B) Sentinel
C) List header
D) List head

18. A graph is a collection of nodes, called ………. And line segments called arcs or ……….. that connect
pair of nodes.
A) vertices, edges
B) edges, vertices

C) vertices, paths

D) graph node, edges

19. A ……….. is a graph that has weights of costs associated with its edges.

A) Network

B) Weighted graph

C) Both A and B

D) None A and B

20. In general, the binary search method needs no more than ……………. comparisons.

A) [log2n]-1

B) [logn]+1

C) [log2n]

D) [log2n]+1

ANSWERS:

1. B) Strongly Connected

2. A) Depth First

3. B) True, True, False

4. C) a-iii, b-i, c-ii

5. B) (N+1)/2

6. A) Linear search

7. D) True, True

8. C) Merge Sort

9. A) True, True10. B) Bipartite

11. B) 0 and -1

12. C) r=(r+1)% QUEUE_SIZE

13. C) Both i and ii

14. B) Linked Lists

15. C) 4

16. D) Traversal

17. B) Sentinel

18. A) vertices, edges

19. C) Both A and B

20. D) [log2n]+1

SOLVED OBJECTIVE QUESTIONS ON DATA STRUCTURE SET-3

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

A) Ordinary queue

B) Single-ended queue

C) Circular queue

D) Priority queue

2. The property of a binary tree is

A) The first subset is called the left subtree

B) The second subtree is called right subtree

C) The root cannot contain NULL

D) The right subtree can be empty

3. State true or false.

i) The degree of root node is always zero.

ii) Nodes that are not root and not leaf are called as internal nodes.

A) True, True

B) True, False

C) False, True

D) False, False

4. Any node is the path from the root to the node is called

A) Successor node

B) Ancestor node

C) Internal node

D) None of the above

5. State true of false.

i) A node is a parent if it has successor nodes.

ii) A node is child node if out degree is one.

A) True, True

B) True, False

C) False, True

D) False, False

6. ………………. is not an operation performed on linear list

a) Insertion b) Deletion c) Retrieval d) Traversal

A) only a,b and c

B) only a and b

C) All of the above

D) None of the above

7. Which is/are the application(s) of stack

A) Function calls

B) Large number Arithmetic

C) Evaluation of arithmetic expressions

D) All of the above

8. A …………… is an acyclic digraph, which has only one node with indegree 0, and other nodes have in-degree 1.

A) Directed tree

B) Undirected tree

C) Dis-joint tree

D) Direction oriented tree

9. …………………. Is a directed tree in which out-degree of each node is less than or equal to two.

A) Unary tree

B) Binary tree

C) Trinary tree

D) Both B and C

10. State true or false.
i) An empty tree is also a binary tree.
ii) In strictly binary tree, the out-degree of every node is either o or 2.
A) True, False
B) False, True
C) True, True
D) False, False

11. Which of the following data structures are indexed structures?
A. Linear arrays
B. Linked lists
C. Queue
D. Stack

12. Which of the following data structure store the homogeneous data elements?
A. Arrays
B. Records
C. Pointers
D. Lists

13. When new data are to be inserted into a data structure, but there is not available space; this situation is usually called ….
A. Underflow
B. overflow
C. houseful
D. saturated

14. A data structure where elements can be added or removed at either end but not in the middle is called …
A. linked lists
B. stacks
C. queues
D. dequeue

15. Operations on a data structure may be …..
A. creation
B. destruction
C. selection
D. all of the above

16. The way in which the data item or items are logically related defines …..
A. storage structure
B. data structure
C. data relationship
D. data operation

17. Which of the following are the operations applicable an primitive data structures?
A. create
B. destroy
C. update
D. all of the above

18. The use of pointers to refer elements of a data structure in which elements are logically adjacent is ....
A. pointers
B. linked allocation
C. stack
D. queue

19. 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 non of above situation

20. Which of the following statement is false?
A. Arrays are dense lists and static data structure.
B. Data elements in linked list need not be stored in adjacent space in memory
C. Pointers store the next data element of a list.
D. Linked lists are collection of the nodes that contain information part and next pointer.

ANSWERS:

1. B) Single ended queue
2. D) The right ..... empty
3. C) False, True
4. B) Ancestor node
5. B) True, False
6. D) None of the above
7. D) All of the above
8. A) Directed tree
9. B) Binary tree
10. C) True, True
11. A. Linear arrays
12. B. Records
13. B. overflow
14. D. dequeue
15. D. all of the above
16. B. data structure
17. D. all of the above
18. B. linked allocation
19. A. for relatively permanent collections of data
20. C. Pointers store the next data element of a list.

SOLVED MCQ ON DATA STRUCTURE AND ALGORITHM SET-4

1. Which of the following data structure is non-linear type?
A) Strings
B) Lists

C) Stacks
D) Tree

2. Which of the following data structure is linear type?
A) Array
B) Tree
C) Graphs
D) Hierarchy

3. The logical or mathematical model of a particular organization of data is called a ....
A) Data structure
B) Data arrangement
C) Data configuration
D) Data formation

4. The simplest type of data structure is ....
A) Multidimensional array
B) Linear array
C) Two-dimensional array
D) Three-dimensional array

5. Linear arrays are also called ....
A) Straight line array
B) One-dimensional array
C) Vertical array
D) Horizontal array

6. 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 the above

7. Which of the following data structures are indexed structures?
A) Linear arrays
B) Linked lists
C) Graphs
D) Trees

8. Each node in a linked list has two pairs of ………….. and ……………….
A) Link field and information field
B) Link field and avail field
C) Avail field and information field
D) Address field and link field

9. A …………………… does not keep track of address of every element in the list.
A) Stack
B) String
C) Linear array
D) Queue

10. When does top value of the stack changes?
A) Before deletion
B) While checking underflow
C) At the time of deletion
D) After deletion

ANSWERS:

1. Which of the following data structure is non-linear type?
D) Tree

2. Which of the following data structure is linear type?
A) Array

3. The logical or mathematical model of a particular organization of data is called a ………
A) Data structure

4. The simplest type of data structure is ………………
B) Linear array

5. Linear arrays are also called ……………….
B) One-dimensional array

6. Arrays are best data structures …………
A) For relatively permanent collections of data.

7. Which of the following data structures are indexed structures?
A) Linear arrays

8. Each node in a linked list has two pairs of ………….. and ……………….
A) Link field and information field

9. A …………………… does not keep track of address of every element in the list.
C) Linear array

10. When does top value of the stack changes?
D) After deletion

MCQ ON DATA STRUCTURE AND ALGORITHM WITH ANSWER SET–5

1. 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

2. Which of the following data structure is not linear data structure?
A) Arrays
B) Linked lists

C) Both of the above
D) None of the above

3. The disadvantage in using a circular linked list is ……………………
A) It is possible to get into infinite loop.
B) Last node points to first node.
C) Time consuming
D) Requires more memory space

4. A linear list in which each node has pointers to point to the predecessor and successors nodes is called as ..
A) Singly Linked List
B) Circular Linked List
C) Doubly Linked List
D) Linear Linked List

5. A ……………….. is a linear list in which insertions and deletions are made to from either end of the structure.
A) circular queue
B) random of queue
C) priority
D) dequeue

6. In a priority queue, insertion and deletion takes place at ………………
A) front, rear end
B) only at rear end
C) only at front end
D) any position

7. The time complexity of quick sort is …………..
A) O(n)
B) O(n2)
C) O(n log n)
D) O(log n)

8. Which of the following is an application of stack?
A) finding factorial
B) tower of Hanoi
C) infix to postfix conversion
D) all of the above

9. The data structure which is one ended is ………………
A) queue
B) stack
C) tree
D) graph

10. A list which displays the relationship of adjacency between elements is said to be
A) linear
B) non linear

C) linked list
D) trees

ANSWERS:

1. Arrays are best data structures
A) for relatively permanent collections of data

2. Which of the following data structure is not linear data structure?
D) None of the above

3. The disadvantage in using a circular linked list is …………………….
A) It is possible to get into infinite loop.

4. A linear list in which each node has pointers to point to the predecessor and successors nodes is called as ..
C) Doubly Linked List

5. A ……………….. is a linear list in which insertions and deletions are made to from either end of the structure.
D) dequeue

6. In a priority queue, insertion and deletion takes place at ………………
D) any position

7. The time complexity of quick sort is …………..
C) O(n log n)

8. Which of the following is an application of stack?
D) all of the above

9. The data structure which is one ended is ………………
B) stack

10. A list which displays the relationship of adjacency between elements is said to be
A) linear

SOLVED OBJECTIVE QUESTIONS ON DATA STRUCTURE SET–6

1. …………………….. is a variable that can hold the address of the variables, structure and functions that are used in the program.
A) Array
B) Pointer
C) Structure
D) None of the above

2. ……………… is the organization of the data in a computers memory or in a file.
A) Array
B) Data Structure

C) Data Management
D) Data Organization

3. Which of the following is/are the advantages of using an array?
i) Multi huge quantity of data items can be stored.
ii) Arrays saves the memory space
iii) Arrays helps to arrange the data items in particular order.
iv) Data item searching is faster.
A) i, ii and iii only
B) ii, iii and iv only
C) i, iii and iv only
D) All i, ii, iii and iv

4. Some examples of data structures are
i) array
ii) stack
iii) queue
iv) binary tree
v) hybrid tree
A) i, ii, iii and iv only
B) ii, iii, iv and v only
C) i, ii, iii and v only
D) All i, ii, iii, iv and v

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☐

**READ ALSO: **

5. Match the following components of data structure based on the concept of Abstract Data Type (ADT) with their definitions.
a) Operations   i) Organizations of data implemented in lower level data structure.
b) Storage structures   ii) Description on how to manipulate information in the storage structure.
c) Algorithms   iii) Specifies the external appearance of data structure.
A) a-i, b-ii, c-iii
B) a-ii, b-iii, c-i
C) a-iii, b-i, c-ii
D) a-i, b-iii, c-ii

6. Match the following properties of an array with their descriptions.
a) Homogeneous   i) the list size is constant.
b) Ordered   ii) there is a first and last element.
c) Finite   iii) there is a next and previous in the natural order of the structure
d) fixed-length   iv) every element is the same.

A) a-i, b-ii, c-iii, d-iv
B) a-ii, b-iii, c-iv, d-i
C) a-iii, b-i, c-ii, d-iii
D) a-iv, b-iii, c-ii, d-i

7. Which of the following are linear type of data structure?
i) Linked list ·
ii) Stack ·
iii) Binary Tree
iv) Array ·
v) Queue ·
A) i, ii, iii and iv only
B) ii, iii, iv and v only
C) i, ii, iv and v only
D) All i, ii, iii, iv and v

8. Which of the following are non linear type of data structure?
i) Tree ·
ii) Graphs ·
iii) Hash tables ·
iv) List
A) i, ii and iii only
B) ii, iii and iv only
C) i, iii and iv only
D) All i, ii, iii and iv

READ ALSO: OBJECTIVE QUESTIONS OF COMPUTER DATA STRUCTURE

9. State whether the following statements is/are True or False.
i) An ancestor is any node in the path from the root to the node.
ii) A sub-tree is any connected structure below the root.
iii) Binary tree is a directed tree in which out degree of each node is less than or equal to one.
iv) A tree consists of finite set of elements called nodes.
v) Nodes that are not root and not leaf are called intermediate nodes.
A) True, True, True, False, True
B) True, False, True, True, False
C) True, True, True, False, False
D) True, True, False, True, False ·

10. In a binary search tree the node to be deleted will have two cases which are
i) An empty left sub-tree and non empty right sub-tree and vice versa.
ii) Non empty left sub-tree and right sub-tree.
iii) Empty left sub-tree and right sub-tree.
A) i and ii only
B) ii, and iii only
C) i and iii only
D) None of the above

ANSWERS:

1. B) Pointer
2. B) Data Structure
3. D) All i, ii, iii and iv
4. A) i, ii, iii and iv only
5. C) a-iii, b-i, c-ii

6. D) a-iv, b-iii, c-ii, d-i
7. C) i, ii, iv and v only
8. A) i, ii and iii only
9. D) True, True, False, True, False
10. A) i and ii only

SOLVED MCQ ON STACK AND QUEUE IN DATA STRUCTURE SET-1

1) ……… 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

2) In liked representation of stack ……. holds the elements of the stack.
A. INFO fields
B. TOP fields
C. LINK fields
D. NULL fields

3) …….. 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

4) In the linked representation of the stack ……… behaves as the top pointer variable of stack.
A. Stop pointer
B. Begin pointer
C. Start pointer
D. Avail pointer

5) New nodes are added to the ……… of the queue.
A. Front
B. Back
C. Middle
D. Both A and B

6) 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

7) What happens when you push a new node onto a stack?
A. The new node is placed at the front of the linked list
B. The new node is placed at the back of the linked list
C. The new node is placed at the middle of the linked list
D. No Changes happens

8) A queue is a ………
A. FIFO
B. LIFO
C. FILO
D. LOFI

9) Which of the following name does not relate to stacks?
A. FIFO lists
B. LIFO lists
C. Piles
D. Push down lists

10) The retrieval of items in a stack is ……….. operation.
A. push
B. pop
C. retrieval
D. access

11) The term push and pop is related to
A. Array
B. Lists
C. Stacks
D. Trees

12) Which is the pointer associated with the stack?
A. FIRST
B. FRONT
C. TOP
D. REAR

13) The elements are removal from a stack in ………. order.
A. Reverse
B. Hierarchical
C. Alternative
D. Sequential

14) The insertion operation in the stack is called ………
A. insert
B. push
C. pop
D. top

15) …… is the term used to insert an element into stack.
A. Push
B. Pull

C. Pop
D. Pump

16) Stack follows the strategy of ……..
A. LIFO
B. FIFO
C. LRU
D. RANDOM

17) ………. is the term used to delete an element from the stack.
A. Push
B. Pull
C. Pop
D. Pump

18) Deletion operation is done using ……… in a queue.
A. front
B. rear
C. top
D. list

19) A pointer variable which contains the location at the top element of the stack is called …..
A. Top
B. Last
C. Final
D. End

20) 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

ANSWERS:

1) B. FIFO, First In First Out
2) A. INFO fields
3) A. LIFO
4) C. Start pointer
5) B. Back
6) B. Bottom of the stack
7) A. The new node is placed at the front of the linked list
8) A. FIFO
9) A. FIFO lists
10) B. pop
11) C. Stacks
12) C. TOP
13) A. Reverse
14) B. push
15) A. Push
16) A. LIFO

17) C. Pop
18) A. front
19) A. Top
20) D. all of the above

MCQ QUESTIONS ON STACK AND QUEUE IN DATA STRUCTURE SET-2

1) The queue in which the insertion takes place in the first position after of last element is a ......
A. priority
B. dequeue
C. circular
D. linked

2) Before inserting into stack one must check the condition ....
A. Overflow
B. Underflow
C. Maximum elements
D. Existing elements

3) The another name of dequeue is ....
A. divided queue
B. distributed queue
C. double ended queue
D. design queue

4) Before deletion condition into stack ...... has to be checked.
A. Overflow
B. Underflow
C. Maximum elements
D. Existing elements

5) In dequeue, insertion and deletion takes place of ....
A. front, rear end
B. only at rear end
C. only at front end
D. both the ends

6) When does Top value of stack change in insertion process?
A. Before insertion
B. After insertion
C. At the time of insertion
D. While checking overflow

7) A queue in which insertion and deletion takes places from any position is called ......
A. circular queue
B. random of queue
C. priority
D. dequeue

8) Deletion in the linked stack takes place by deleting ……..
A. Node pointed by the start process.
B. End of the list
C. Beginning of the list
D. Middle of the list

9) Which of the following name does not relate to stacks?
A. FIFO lists
B. LIFO list
C. piles
D. push-down lists

10) The condition …….. indicate the queue is empty.
A. Front=Null
B. Null=Front
C. Front=Rear
D. Rear=Null

11) Which of the following is not the type of queue?
A. Ordinary queue
B. Special queue
C. Priority queue
D. Circular queue

12) The value of REAR is increased by 1 when …….
A. An element is deleted in a queue
B. An element is traversed in a queue
C. An element is added in a queue
D. An element is merged in a queue

13) The operations that can be done in a circular queue is/are …..
A. Insert from the front end
B. Delete from front end
C. Display queue contents
D. All of the above

14) The term dequeue is the contraction of the name ……..
A. Double ended queue
B. Double sided queue
C. Double headed queue
D. Double address queue

15) The various operations that can be performed on stacks is/are …..
A. Insert an item into the stack
B. Delete an item from the stack
C. Display the contents of the stack
D. All of the above

16) …………. is a collection of elements such that each element has been assigned a processing priority.
A. Priority queue

B. Procedure queue

C. Main queue

D. Interrupt queue

17) The deletion operation in stack is called ……

A. insert

B. push

C. pop

D. top

18) Link fields holds pointers to the ………. element in the linked representation of stack.

A. Neighboring

B. Last

C. First

D. Middle

19) The pointer associated with the stack is ………..

A. front

B. rear

C. top

D. link

20) 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

ANSWERS:

1) C. circular

2) A. Overflow

3) C. double-ended queue

4) B. Underflow

5) D. both the ends

6) A. Before insertion

7) C. priority

8) A. Node pointed by the start process

9) A. FIFO lists

10) A. Front=Null

11) B. Special queue

12) C. An element is added in a queue

13) D. All of the above

14) A. Double-ended queue

15) D. All of the above

16) A. Priority queue

17) C. pop

18) A. Neighboring

19) C. top

20) A. Decrease the numbers of times overflow may occur

SOLVED MCQ ON TREE AND GRAPH IN DATA STRUCTURE SET-1

1) The operation of processing each element in the list is known as ......
A. sorting
B. merging
C. inserting
D. traversal

2) Another name for the directed graph is ....
A. Direct graph
B. Digraph
C. Dir-graph
D. Digraph

3) Binary trees with threads are called as ....
A. Threaded trees
B. Pointer trees
C. Special trees
D. Special pointer trees

4) Graph G is .... if for any pair u, v of nodes in G there is a path from u to v or path from v to u.
A. Literally connected
B. Widely Connected
C. Unliterally connected
D. Literally connected

5) In Binary trees, nodes with no successor are called ......
A. End nodes
B. Terminal nodes
C. Final nodes
D. Last nodes

6) A connected graph T without any cycles is called ....
A. free graph
B. no cycle graph
C. non-cycle graph
D. circular graph

7) Trees are said .... if they are similar and have the same contents at corresponding nodes.
A. Duplicate
B. Carbon copy
C. Replica
D. Copies

8) A connected graph T without any cycles is called a ....
A. A tree graph
B. Free tree

C. A tree d
D. All of the above

9) Every node N in a binary tree T except the root has a unique parent called the ……… of N.
A. Antecedents
B. Predecessor
C. Forerunner
D. Precursor

10) In a graph if E=(u,v) means ……
A. u is adjacent to v but v is not adjacent to u
B. e begins at u and ends at v
C. u is processor and v is the successor
D. both b and c

Read Also: Interview Questions on Stack and Queue in Data Structure set-2

11) Sequential representation of binary tree uses ……..
A. Array with pointers
B. Single linear array
C. Two-dimensional arrays
D. Three-dimensional arrays

12) In a graph, if e=[u,v], Then u and v are called ……..
A. Endpoints of e
B. Adjacent nodes
C. Neighbors
D. All of the above

13) TREE[1]=NULL indicates the tree is ……..
A. Overflow
B. Underflow
C. Empty
D. Full

14) 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. data structure

15) Linked representation of binary tree needs ……… parallel arrays.
A. 4
B. 2
C. 3
D. 5

16) The depth of the complete binary tree is given by ……
A. Dn = n log2n
B. Dn= n log2n+1
C. Dn = log2n
D. Dn = log2n+1

17) In a 2-tree, nodes with 0 children are called …………
A. Exterior node
B. Outside node
C. Outer node
D. External node

18) Which indicates pre-order traversal?
A. Left sub-tree, Right sub-tree and root
B. Right sub-tree, Left sub-tree and root
C. Root, Left sub-tree, Right sub-tree
D. Right sub-tree, root, Left sub-tree

19) In extended-binary tree nodes with 2 children are called ……..
A. Interior node
B. Domestic node
C. Internal node
D. Inner node

20) A terminal node in a binary tree is called …………
A. Root
B. Leaf
C. Child
D. Branch

Answers:

1) D. traversal
2) D. Digraph
3) A. Threaded trees
4) C. Unliterally connected
5) B. Terminal nodes
6) A. free graph
7) D. Copies
8) D. All of the above
9) B. Predecessor
10) D. both b and c
11) A. Array with pointers
12) D. All of the above
13) C. Empty
14) C. extended binary tree
15) C. 3
16) D. Dn = log2n+1
17) D. External node
18) C. Root, Left sub-tree, Right sub-tree
19) C. Internal node
20) B. Leaf

MCQ QUESTIONS ON TREE AND GRAPH IN DATA STRUCTURE SET-2

1) The post-order traversal of the binary tree is DEBFCA. Find out the pre-order traversal.
A. ABFCDE
B. ADBFEC
C. ABDECF
D. ABDCEF

2) While converting the 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. Vanished on extended tree
D. Intermediate nodes on extended tree

3) The in-order traversal of the tree will yield a sorted listing of elements of tree in ……..
A. binary trees
B. binary search trees
C. heaps
D. binary heaps

4) In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called ………
A. Leaf
B. Branch
C. Path
D. Thread

5) In a head tree …..
A. values in a node are greater than every value in the left subtree and smaller than the right subtree.
B. values in a node are greater than every value in children of it.
C. conditions.
D. terms.

6) The in-order traversal of the tree will yield a sorted listing of elements of tree in…
A. Binary trees
B. Binary search trees
C. Merging
D. AVL Trees

7) In a graph if e=(u,v) means …….
A. u is adjacent to v but v is not adjacent to u.
B. e begins at u and ends at v
C. u is node and v is an edge.
D. both u and v are edges.

8) 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. E2 tree

9) If every node u in G is adjacent to every other node v in G, A graph is said to be ……..
A. isolated
B. complete
C. finite
D. strongly connected.

10) The post order traversal of a binary tree is DEBFCA. Find out the pre-order Traversal.
A. ABFCDE
B. ADBFEC
C. ABDECF
D. ABDCEF

Read Also: Solved MCQ on Tree and Graph in Data Structure

11) In a graph, if e=[u,v], then u and v are called
A. endpoints of e
B. adjacent nodes
C. neighbors
D. all of the above

12) In-order traversing a tree resulted in E A C K F H D B G; the pre-order traversal would return.
A. FAEKCDBHG
B. FAEKCDHGB
C. EAFKHDCBG
D. FEAKDCHBG

13) A connected graph T without any cycles is called.
A. a tree graph
B. free tree
C. a tree
D. All of the above

14) In the linked representation of Binary trees LEFT[k] contains the …….. of at the node N, where k is the location.
A. Data
B. Location and left child
C. Right child address
D. Null value

15) If every node u in G adjacent to every other node v in G, A graph is said to be
A. isolated
B. complete
C. finite
D. strongly connected

16) Three standards ways of traversing a binary tree T with root R …….
A. Prefix, infix, postfix
B. Pre-process, in-process, post-process
C. Pre-traversal, in-traversal, post-traversal
D. Pre-order, in-order, post-order

17) A graph is said to be ……. if every node u in G is adjacent to every other node v in G.
A. Absolute
B. Entire
C. Inclusive
D. Complete

18) In threaded binary tree ……… points to higher nodes in the tree.
A. Info
B. Root
C. Threads
D. Child

19) A graph is said to be ……. if its edges are assigned data.
A. Tagged
B. Marked
C. Lebeled
D. Sticked

20) If node N is a terminal node in a binary tree then its ………
A. Right tree is empty
B. Left tree is empty
C. Both left & right subtrees are empty
D. The root node is empty

Answers:

1) C. ABDECF
2) A. Internal nodes on extended tree
3) B. binary search trees
4) D. Thread
5) B. values in a node is greater than every value in children of it.
6) B. Binary search trees
7) B. e begins at u and ends at v
8) C. Extended binary tree
9) B. complete
10) C. ABDECF
11) D. All of the above
12) B. FAEKCDHGB
13) D. All of the above
14) A. Data
15) B. complete
16) D. Pre-order, in-order, post-order
17) D. Complete
18) C. Threads

19) C. Lebeled
20) C. Both left & right subtrees are empty

TOP 20 MCQ QUESTIONS ON TREES AND THEIR APPLICATIONS

1. In …………………….. ; for any node n, every descendant node's value in the left subtree of n is less than the value of n and every descendant node's value in the right subtree is greater than the value n.
A) binary tree
B) binary search tree
C) AVL tree
D) binary heap tree

2. For finding a node in a …………………, at each stage we ideally reduce the number of nodes we have to check by half.
A) binary tree
B) binary search tree
C) AVL tree
D) binary heap tree

3. In the best case of BST, the time is on the order of ……………………, but in the worst case it requires linear time.
A) $\log_2 n$
B) n
C) $\log_2(n+1)$
D) n+1

4. …………………. of binary search tree starts by visiting the current node, then its left child and then its right child.
A) Preorder traversal
B) In-order traversal
C) Linear traversal
D) Post-order traversal

5. The order with which the nodes are inserted affects the running time of the ……………………. search algorithm.
A) AVL Tree
B) Red-Black Tree
C) Binary Search Tree
D) Binary Heap Tree

6. ……………….. of binary search tree starts by visiting the current node's left child, then its right child and finally the current node itself.
A) Preorder
B) In-order
C) Linear
D) Post-order

7. With an ideal balance, the running time for inserts, searches and deletes, even in the worst case is …………………………
A) $\log_2 n$
B) n
C) $\log_2(n+1)$
D) n+1

8. In binary search tree, a …………………. exists if starting from some node n there exists a path that returns to n.
A) cycle
B) node
C) root
D) subtree

9. In binary search tree, a …………………… rooted to node n is the tree formed by imaging node n was a root.
A) cycle
B) node
C) root
D) subtree

10. ………………………… is a binary search tree whose left subtree and right subtree differ in height by at most 1 unit and whose left and right subtrees are themselves AVL trees.
A) Red-Black Tree
B) AVL Tree
C) Binary Head Tree
D) A-A Tree

11. ………………… is a binary search tree whose leaves are external nodes.
A) Red-Black Tree
B) AVL Tree
C) Binary Heap Tree
D) A-A Tree

12. Which of the following is/are properties of red-black tree.
i) every node is either red or black ii) the root is red iii) If a node is red, then both its children are black iv) every leaf is black
A) i, ii and iii only
B) i, iii and iv only
C) i, ii and iv only
D) All i, ii, iii and iv

13. A lemma is a red-black tree with n internal nodes has height at most ……………
A) 2lg(n)
B) 2n
C) 2lg(n+1)
D) n+1

14. While inserting into …………………………., insertions are done at a leaf and will replace an external node with an internal node with two external children.
A) red-black tree

B) AVL tree
C) binary search tree
D) binary heap tree

15. For an AVL tree …………………………. is the additional piece of information which indicates if the difference in height between the left and right subtree is the same or if not, which of the two subtrees has height one unit larger.
A) tree factor
B) balance factor
C) additional factor
D) unit factor

16. ………………… is a complete binary tree, that is completely filled except possibly at the bottom level.
A) Red-Black Tree
B) AVL Tree
C) Binary Heap Tree
D) A-A Tree

17. In a …………………….. for every node X with a parent P, the key in P is less than or equal to the key in X.
A) red-black
B) AVL
C) binary search
D) binary heap

18. An insertion into a ………………………. is performed by inserting the new node in the location referenced by next in the array and then "sifting it up" by comparing the key of the newly inserted node with the key of the parent.
A) red-black
B) AVL
C) binary search
D) binary heap

19. While deleting nodes from a binary heap, …………………. node is replaced by the last leaf in the tree.
A) left leaf
B) right leaf
C) root
D) cycle

20. The worst-case height of an AVL tree with n nodes is ……………
A) 2 lg n
B) 1.39 lg n
C) 1.44 lg n
D) 1.64 lg n

Answers

1. B) binary search tree
2. B) binary search tree

3. A) $\log_2 n$
4. A) Preorder traversal
5. C) Binary Search Tree
6. D) Post-order
7. A) $\log_2 n$
8. A) cycle
9. D) subtree
10. B) AVL Tree
11. A) Red-Black Tree
12. B) i, iii and iv only
13. C) $2\lg(n+1)$
14. A) red-black tree
15. B) balance factor
16. C) Binary Heap Tree
17. D) binary heap
18. D) binary heap
19. C) root
20. C) 1.44 lg n

MCQ ON LIST AND LINKED LIST IN DATA STRUCTURE SET-1

1) Linked lists are best suited …..
A. for relatively permanent collections of data.
B. the size of the structure and the data in the structure are constantly changing.
C. data structure
D. for none of the above situation

2) The operation of processing each element in the list is known as ……
A. sorting
B. merging
C. inserting
D. traversal

3) The situation when in a linked list START=NULL is ….
A. Underflow
B. Overflow
C. Houseful
D. Saturated

4) Each node in singly linked list has …….. fields.
A. 2
B. 3
C. 1
D. 4

5) Which of the following are two-way lists?
A. Grounded header list

B. Circular header list
C. Linked list with header and trailer nodes
D. List traversed in two directions

6) Which is the pointer associated with the availability list?
A. FIRST
B. AVAIL
C. TOP
D. REAR

7) Value of first linked list index is ….
A. 0
B. 1
C. -1
D. 2

8) In linked lists, there are no NULL links in
A. single linked list
B. linear doubly linked list
C. circular linked list
D. linked list

9) Each node in a linked list must contain at least …..
A. Three fields
B. Two fields
C. Four fields
D. Five fields

10) The dummy header in linked list contain …..
A. first record of the actual data
B. last record of the actual data
C. pointer to the last record of the actual data
D. middle record of the actual data

11) In a linked list the ………. field contains the address of next element in the list.
A. Link field
B. Next element field
C. Start field
D. Info field

Table of Contents

☐

READ ALSO: [MCQ ON SEARCHING, MERGING AND SORTING METHODS IN DATA STRUCTURE](#)

12) LLINK is the pointer pointing to the …
A. successor node
B. predecessor node
C. head node
D. last node

13) ………. refers to a linear collection of data items.
A. List
B. Tree
C. Graph
D. Edge

14) A run list is ……
A. small batches of records from a file
B. number of elements having same value
C. number of records
D. number of files in external storage

15) A …… indicates the end of the list.
A. Guard
B. Sentinel
C. End pointer
D. Last pointer

16) A …….. is a linear list in which insertions and deletions are made to from either end of the structure.
A. circular queue
B. random of queue
C. priority
D. dequeue

17) Indexing the …….. element in the list is not possible in linked lists.
A. middle
B. first
C. last
D. any where in between

18) A linear list in which the pointer points only to the successive node is ……
A. singly linked list
B. circular linked list
C. doubly linked list
D. none of the above

19) ………. may take place only when there is some minimum amount(or) no space left in free storage list.
A. Memory management
B. Garbage collection
C. Recycle bin
D. Memory management

20) A linear list in which the last node points to the first node is ……..
A. singly linked list
B. circular linked list
C. doubly linked list
D. none of the above

ANSWERS:

1) B. the size of the structure and the data in the structure are constantly changing.
2) D. traversal
3) A. Underflow
4) A. 2
5) D. List traversed in two directions
6) B. AVAIL
7) A. 0
8) C. circular linked list
9) B. Two fields
10) A. first record of the actual data
11) A. Link field
12) B. predecessor node
13) A. List
14) A. small batches of records from a file
15) B. Sentinel
16) D. dequeue
17) A. middle
18) A. singly linked list
19) B. Garbage collection
20) B. circular linked list

MCQ QUESTIONS ON THE LIST & LINKED LIST IN DATA STRUCTURE SET-2

1) To insert a new node in the linked list free node will be available in ……..
A. Available list
B. Avail list
C. Free node list
D. Memory space list

2) A singly linked list is also called as ……..
A. linked list
B. one way chain
C. two way chain
D. right link

3) A ….. list is a header list where the node points back to the header node.
A. Circular header
B. Grounded header
C. Two-way header
D. One way header

4) A doubly linked list has ………. pointers with each node.
A. 0
B. 1
C. 2
D. 3

5) Header linked lists are frequently used for maintaining …….. in memory.
A. Polynomials
B. Binomial
C. Trinomial
D. Quadratic equation

6) The pointer that points to the first node in the list is ……..
A. FIRST
B. AVAIL
C. TOP
D. REAR

7) The two-way list may be maintained in memory by means of ………….
A. Queues
B. Linear arrays
C. Non-linear arrays
D. Stacks

8) A doubly linked list is also called as ……….
A. linked list
B. one way chain
C. two way chain
D. right link

9) The list that requires two pointer variables FIRST and LAST is called ……..
A. Circular list
B. Header list
C. One way list
D. Two-way list

Read Also: [Solved MCQ on List and Linked List in Data Structure](#)

10) If the availability list is null, then the condition is said to be ………
A. nil block
B. availability list underflow
C. availability list overflow
D. memory loss

11) The list which has its own pointer is called ……..
A. pointer list
B. self pointer
C. free pool
D. own pointer

12) Which of the following are two-way lists?
A. Grounded header list
B. Circular header list
C. Linked list with header and trailer nodes
D. None of the above

13) A ………. is a header list where the last node contains the null pointer.
A. grounded header list

B. bottom header list
C. down header list
D. dropped header list

14) RLINK is the pointer pointing to the …
A. successor node
B. predecessor node
C. head node
D. last node

15) A ………….. is a header list where the last node points back to the header node.
A. rounded header list
B. circular header list
C. common header list
D. forward header list

16) In a linked list, insertion can be done as ………
A. beginning
B. end
C. middle
D. all of the above

17) In a two-way list each node is divided into …….parts.
A. 1
B. 2
C. 3
D. 4

18) The disadvantage in using a circular linked list is …….
A. it is possible to get into an infinite loop
B. last node points to the first node.
C. time consuming
D. requires more memory space.

19) Which of the following conditions checks available free space in the avail list?
A. Avail=Null
B. Null=Avail
C. Avail=Max stack
D. Avail=Top

20) A linear list in which each node has pointed to the predecessor and successors nodes is called
……..
A. singly linked list
B. circular linked list
C. doubly linked list
D. linear linked list

Answers:

1) B. Avail list
2) B. one way chain
3) A. Circular header

4) C. 2
5) A. Polynomials
6) A. FIRST
7) B. Linear arrays
8) C. two way chain
9) D. Two way list
10) B. availability list underflow
11) C. free pool
12) D. None of the above
13) A. grounded header list
14) A. successor node
15) B. circular header list
16) D. All of the above
17) C. 3
18) A. it is possible to get into an infinite loop
19) A. Avail=Null
20) C. doubly linked list

MCQ ON SEARCHING, MERGING AND SORTING METHODS IN DATA STRUCTURE SET-1

1) Finding the location of a given item in a collection of items is called ……
A. Discovering
B. Finding
C. Searching
D. Mining

2) Which of the following is an external sorting?
A. Insertion Sort
B. Bubble Sort
C. Merge Sort
D. Tree Sort

3) Very slow way of sorting is ……….
A. Insertion sort
B. Heap sort
C. Bubble sort
D. Quick sort

4) Which of the following is an internal sorting?
A. Tape Sort
B. 2-way Merge Sort
C. Merge Sort
D. Tree Sort

5) Sorting a file F usually refers to sorting F with respect to a particular key called …..
A. Basic key
B. Primary key

C. Starting key
D. Index key

6) The time complexity of quicksort is ……..
A. O(n)
B. O(logn)
C. O(n2)
D. O(n logn)

7) Selection sort first finds the ………. element in the list and put it in the first position.
A. Middle element
B. Largest element
C. Last element
D. Smallest element

8) Quick sort is also known as ……..
A. merge sort
B. tree sort
C. shell sort
D. partition and exchange sort

9) The operation that combines the element is of A and B in a single sorted list C with n=r+s element is called ….
A. Inserting
B. Mixing
C. Merging
D. Sharing

10) A tree sort is also known as ……… sort.
A. quick
B. shell
C. heap
D. selection

Read Also: Objective Questions on List and Linked List in Data Structure set-2

11) ………. sorting is good to use when alphabetizing a large list of names.
A. Merge
B. Heap
C. Radix
D. Bubble

12) The easiest sorting is ……..
A. quick sort
B. shell sort
C. heap sort
D. selection sort

13) Which of the following sorting algorithm is of divide and conquer type?
A. Bubble sort
B. Insertion sort

C. Quicksort

D. Merge sort

14) Merging k sorted tables into a single sorted table is called ......

A. k way merging

B. k th merge

C. k+1 merge

D. k-1 merge

15) The function used to modify the way of sorting the keys of records is called ....

A. Indexing function

B. Hash function

C. Addressing function

D. All of the above

16) If the number of record to be sorted large and the key is short, then ...... sorting can be efficient.

A. Merge

B. Heap

C. Radix

D. Bubble

17) The total number of comparisons in a bubble sort is ....

A. O(n logn)

B. O(2n)

C. O(n2)

D. O(n)

18) If the number of record to be sorted large and the key is long, then ...... sorting can be efficient.

A. Merge

B. Heap

C. Quick

D. Bubble

19) The time complexity of heap sort is ....

A. O(n)

B. O(logn)

C. O(n2)

D. O(n logn)

20) The complexity of selection sort is ....

A. O(n)

B. O(n2)

C. O(n logn)

D. O(logn)

Answers:

1) C. Searching

2) C. Merge Sort

3) A. Insertion sort

4) D. Tree Sort

5) B. Primary key

6) D. O(n logn)
7) D. Smallest element
8) D. partition and exchange sort
9) C. Merging
10) C. heap
11) C. Radix
12) D. selection sort
13) C. Quick sort
14) A. k way merging
15) B. Hash function
16) C. Radix
17) A. O(n logn)
18) C. Quick
19) D. O(n logn)
20) B. O(n2)

SOLVED MCQ ON SEARCHING AND SORTING ALGORITHMS IN DATA STRUCTURE SET–2

1) 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 item is not there at all

2) If the number of records to be sorted is small, then …… sorting can be efficient.
A. Merge
B. Heap
C. Selection
D. Bubble

3) The complexity of the sorting algorithm measures the …… as a function of the number n of items to be sorter.
A. average time
B. running time
C. average-case complexity
D. case-complexity

4) Which of the following is not a limitation of binary search algorithm?
A. must use a sorted array
B. requirement of sorted array is expensive when a lot of insertion and deletions are needed
C. there must be a mechanism to access middle element directly
D. binary search algorithm is not efficient when the data elements more than 1500.

5) The Average case occurs in the linear search algorithm ……….
A. when the item is somewhere in the middle of the array
B. when the item is not the array at all

C. when the item is the last element in the array

D. Item is the last element in the array or item is not there at all

6) Binary search algorithm cannot be applied to …

A. sorted linked list

B. sorted binary trees

C. sorted linear array

D. pointer array

7) Complexity of linear search algorithm is ………

A. O(n)

B. O(logn)

C. O(n2)

D. O(n logn)

8) Sorting algorithm can be characterized as ……

A. Simple algorithm which require the order of n2 comparisons to sort n items.

B. Sophisticated algorithms that require the O(nlog2n) comparisons to sort items.

C. Both of the above

D. None of the above

9) The complexity of bubble sort algorithm is …..

A. O(n)

B. O(logn)

C. O(n2)

D. O(n logn)

10) State True or False for internal sorting algorithms.

i) Internal sorting are applied when the entire collection if data to be sorted is small enough that the sorting can take place within main memory.

ii) The time required to read or write is considered to be significant in evaluating the performance of internal sorting.

A. i-True, ii-True

B. i-True, ii-False

C. i-False, ii-True

D. i-False, ii-False

11) The complexity of merge sort algorithm is ……

A. O(n)

B. O(logn)

C. O(n2)

D. O(n logn)

12) ………. is putting an element in the appropriate place in a sorted list yields a larger sorted order list.

A. Insertion

B. Extraction

C. Selection

D. Distribution

13) …………order is the best possible for array sorting algorithm which sorts n item.
A. O(n logn)
B. O(n2)
C. O(n+logn)
D. O(logn)

14) ……… is rearranging pairs of elements which are out of order, until no such pairs remain.
A. Insertion
B. Exchange
C. Selection
D. Distribution

15) ………… is the method used by card sorter.
A. Radix sort
B. Insertion
C. Heap
D. Quick

16) Which of the following sorting algorithm is of divide and conquer type?
A. Bubble sort
B. Insertion sort
C. Merge sort
D. Selection sort

17) …….. sorting algorithm is frequently used when n is small where n is total number of elements.
A. Heap
B. Insertion
C. Bubble
D. Quick

18) Which of the following sorting algorithm is of priority queue sorting type?
A. Bubble sort
B. Insertion sort
C. Merge sort
D. Selection sort

19) Which of the following is not the required condition for a binary search algorithm?
A. The list must be sorted
B. There should be direct access to the middle element in any sublist
C. There must be a mechanism to delete and/or insert elements in the list.
D. Number values should only be present

20) Partition and exchange sort is ……..
A. quick sort
B. tree sort
C. heap sort
D. bubble sort

ANSWERS:

1) D. Item is the last element in the array or ..
2) C. Selection

3) B. running time
4) D. binary search algorithm is not efficient ..
5) A. when the item is somewhere in the middle ..
6) A. sorted linked list
7) A. O(n)
8) C. Both of the above
9) C. O(n2)
10) B. i-True, ii-False
11) D. O(n logn)
12) A. Insertion
13) C. O(n+logn)
14) B. Exchange
15) A. Radix sort
16) C. Merge sort
17) B. Insertion
18) D. Selection sort
19) C. There must be a mechanism to delete and/or insert elements in the list.
20) A. quick sort