DATA Structure MCQ

<mark>UNIT 1</mark>

- 1. Which of the following is linear data structure?
- a. Trees
- b. Graphs
- <mark>c. Arrays</mark>
- d. None of these

2. Which of the following is linear data structure?

- a. Trees
- b. Graphs

<mark>c. Arrays</mark>

d. None of these

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

- a. Array
- b. Linked lists
- c. Stacks
- d. None of these
- 4. User defined data type is also called?
- a. Primitive
- <mark>b. Non-primitive</mark>
- c. Identifier
- d. None of these

5. Stack is based on which principle

- a. FIFO
- b. Push
- c. LIFO
- d. None of these

6. Describes the running time of an algorithm

a. Asymptotic Notation

- b. Time complexity
- c. Performance Analysis
- d. None of these

7. A procedure for solving a problem in terms of action and their order is called as

- a. Process
- b. Program instruction
- <mark>c. Algorithm</mark>

8. Algorithm can be represented as

- a. Pseudocode
- b. Flowchart
- c. None of the above
- d. both Pseudocode and Flowchart
- 9. Algorithm should have finite number of steps
- <mark>a. True</mark>
- b. False

10. Which of the following is not a Characteristics of a Data Structure?

a. Completeness

- b. Correctness
- c. Time Complexity
- d. Space Complexity

11. Which of the following is not a data structure operation

- a. Deletion
- b. Traverse
- <mark>c. Code</mark>
- d. Sorting

12. An algorithm should have _

well-defined outputs.

- a. 0
- b. 1
- c. 0 or more
- d. 1 or more

13.LIFO stands for

- a. Last In First Out
- b. Late In First Out
- c. Light In Figure Out
- d. None of the Above

14.Implementation of non – linear data structure is easy

- a. True
- b. False

15.____ can be defined as process of combining elements of two data structure

- a. Insertion
- b. Deletion
- c. Sorting
- d. Merging

16._____ can be defined as process of arranging elements of data structure

- a. Insertion
- b. Deletion
- c. Sorting
- d. Merging

<mark>UNIT 2</mark>

1. Space complexity of an algorithm is the maxir	num am	nount of	required by it
during execution.			

- a. Time
- b. Operations
- c. Memory space
- d. None of the above

2. To measure Time complexity of an algorithm Big O notation is used which:

- a. describes limiting behaviour of the function
- b. characterizes a function based on growth of function
- c. upper bound on growth rate of the function
- d. all of the mentioned

3. How is time complexity measured?

- a. By counting the number of statements in an algorithm
- b. By counting the number of primitive operations performed by the algorithm on a given input size
- c. By counting the size of data input to the algorithm
- d. None of the above
- 4. Data space is
 - a. Amount of space used by the variables and data types
 - b. Amount of space used by the variables and constants
 - c. Amount of space used by the constants and data types
 - d. None of above

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

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

6. Which of the following are types of assumption notations?

- a. Big Theta
- b. Big Oh
- c. Big Omega
- d. All of above

7. Which of the following best describes the useful criterion for comparing the efficiency of algorithms?

- a. Time
- b. Memory
- c. Both of the above
- d. None of the above

8. Which are not looping structures?

- a. For loop
- b. While loop
- c. Do...while loop
- <mark>d. if...else</mark>

9. The first expression in a for... loop is

- a. Step value of loop
- b. Value of the counter variable
- c. Condition statement
- d. None of the above

10. Which of the following control structures is an exit-controlled loop?

- a. For loop
- b. While loop
- c. Const and Goto
- d. Do-While loop

11. Which of the following is an invalid if-else statement?

a. if (if (a == 1)){}

- b. if (func1 (a)){}
- c. if (a){}
- d. if ((char) a){}

12. Which of the following statement about for loop is true?

- a. Index value is retained outside the loop
- b. Index value can be changed from within the loop
- c. Goto can be used to jump, out of the loop
- d. All of these

13. Which of the following statement about for loop is true?

- a. Index value is retained outside the loop
- b. Index value can be changed from within the loop
- c. Go to can be used to jump, out of the loop
- d. All of these

14. Some algorithm control structures are

a. Sequencing, if-else, for loop, while loop

- b. Insertion, deletion
- c. Sorting and merging
- d. All of above

15. Loops in C Language are implemented using?

- a. While Block
- b. For Block
- c. Do While Block
- d. All the above

16. Which loop is guaranteed to execute at least one time?

- a. For
- b. While
- <mark>c. do while</mark>
- d. None of the above

<mark>UNIT 3</mark>

- 1. Which one is incorrect statement?
 - a. int x=90;
 - b. int *ptr1,*ptr2;
 - <mark>c. ptr1=&x;</mark>
 - d. ptr2=ptr1;
- 2. Which one is incorrect statement?
 - a. int x=90;
 - b. int *ptr1,*ptr2;
 - <mark>c. ptr1=&x;</mark>
 - d. ptr2=ptr1;

3. Which of the following symbol is used for declare a pointe.

- a. @
- b. \$
- <mark>с. *</mark>

4. What are the applications of pointers?

- a. Implement data structure
- b. Dynamic memory allocation
- c. Accessing array and functions
- d. Above all

5. What are the applications of pointers?

- a. Implement data structure
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- <mark>d. Above all</mark>

6. What are the correct statements about pointers?

- a. Pointer is a variable that stores the address of another variable
- b. Pointer can also be used to refer to another pointer function
- c. Pointers assign and releases the memory as well

d. All of above.

7. What format specifier is used for pointers?

- a. %c
- b. %d
- <mark>c. %p</mark>
- d. %s
- 8. What is the output of following program?
 - a. 1
 - b. 2
 - <mark>c. 0</mark>
 - d. 4
- 9. Which one is incorrect statement?
 - a. int x=90;
 - b. int *ptr1,*ptr2;
 - <mark>c. ptr1=&x;</mark>
 - d. ptr2=ptr1;

10. What type of arithmetic operations can be performed on pointers?

- a. Addition
- b. Subtraction
- c. Multiply
- d. Above all

<mark>UNIT 4</mark>

1. What is an Array?

- a. A group of elements of same data type.
- b. An array contains more than one element.
- c. Array elements are stored in memory in continuous or contiguous locations.
- d. All the above.

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- b. An array contains more than one element.
- c. Array elements are stored in memory in continuous or contiguous locations.
- d. All the above.

3. An array Index starts with?

- a. 1
- b. 0
- c. -1
- d. 2

4. Arrays can

- a. store data elements of same data type at contiguous memory location.
- b. be used for CPU scheduling.
- c. be used for reverse data elements, sort data elements etc.
- d. All of above

5. How many kinds of elements an array can have?

- a. Char and int type
- b. Only char type
- c. Only int type
- d. All of them have same type

6. Choose the correct statement

- a. Array stores data of the same type
- b. Array can be a part of a structure
- c. Array of structure is allowed
- d. All of the above

7. Two dimensional arrays in C

a. An array of arrays is known as two dimensional array.

- b. An array of loops
- c. An array of tokens
- d. All of above

8. Choose the correct syntax for two dimensional array

- a. data_type name_of_array;
- b. data_type name_of_array[rows][columns];
- c. data_type [rows][columns];
- d. name_of_array[rows][columns];

9.

What will be the output of the following C code? #include <<u>stdio.h</u>>

```
void main()
```

```
{
```

```
int a[2][3] = {1, 2, 3, 4, 5};
```

```
int i = 0, j = 0;
```

```
for (i = 0; i < 2; i++)
```

```
for (j = 0; j < 3; j++)
```

```
printf("%d", a[i][j]);
```

```
}
```

a. 123450

- b. 12345 junk
- c. 123455
- d. Run time error

```
10. What will be the output of the following C code?
#include <stdio.h>
```

```
void main()
{
    int a[2][3] = {1, 2, 3, 4, 5};
    int i = 0, j = 0;
    for (i = 0; i < 2; i++)
    for (j = 0; j < 3; j++)
    printf("%d", a[i][j]);</pre>
```

- <mark>a.123450</mark> b.12345 junk
- c. 123455
- d. Run time error

11. How do you initialize an array in C programming?

- a. int arr[3] = (1,2,3);
- b. int arr(3) = {1,2,3};
- c. int arr[3] = {1,2,3};
- d. int arr(3) = (1,2,3);
- 12. Matrix can be represented using one dimension array.
 - a. True
 - b. False

13. What are the advantages of arrays?

- a. Objects of mixed data types can be stored
- b. Elements in an array cannot be sorted
- c. Index of first element of an array is 1
- d. Easier to store elements of same data type

14. What is the maximum number of dimensions an array in C may have?

- a. Two
- b. Eight
- c. Sixteen
- d. Theoretically no limit. The only practical limits are memory size and compilers

15. Array can be considered as set of elements stored in consecutive memory locations but having ______.

a. Same data type

- b. Different data type
- c. Same scope
- d. None of these

16. Array is an example of _____ type memory allocation.

a. Compile time

- b. Run time
- c. All of above
- d. None of the above

17. Array elements assessed using index of array.

- a. True
- b. False

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- b. Run time
- c. All of above
- d. None of the above

23. Array elements assessed using index of array.

- <mark>a. True</mark>
- b. False

<mark>UNIT 5</mark>

1. Choose the correct statement

- a. Search in array is delete an element from array
- b. Search in array is insert an element in array
- c. Search in array is find an element from array
- d. None of above

2. Choose the correct statement

- a. Search in array is delete an element from array
- b. Search in array is insert an element in array
- c. Search in array is update an element in array
- d. None of above

3. Searching is a process in which we find element in array

<mark>a. True</mark>

b. False

4. What are the disadvantages of arrays?

- a. Data structure like queue or stack cannot be implemented
- b. There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size
- c. Index value of an array can be negative
- d. Elements are sequentially accessed

5. Traversal is process of visit each element of an array

a. True

- b. False
- 6. A ____ is required to perform traversal of an array

<mark>a. Loop</mark>

- b. Switch Statement
- c. Constant
- d. All of above

7. Insertion in array insert a new element into array

- a. True
- b. False

8. Choose the correct statement

- a. We can't perform insertion on array
- b. We can't perform deletion on array
- c. We can't traverse an array element
- d. None of above

9. Choose the right statement

- a. Insert an element at beginning is possible
- b. Insert an element at end is possible
- c. Insert an element at given location is possible
- d. All of above

10. Deletion of an element from the array reduces the size of the array by _____

<mark>a. one</mark>

- b. Two
- c. Three
- d. Four

11. Deletion of an element from the array is

a. Remove value from array

- b. Insert Value in array
- c. Merge an array
- d. All of above

12. After performing deletion on array, its required to re-organizing all elements of array

a. True

b. False

13. To merge two arrays we need at least three array variables

<mark>a. True</mark>

b. False

14. To perform merge operation on array, minimum _____ arrays required

- <mark>a. 2</mark> b. 1 c. -2
- d. 0

<mark>UNIT 6</mark>

type of memory allocation.

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

<mark>a. Linked list</mark>

- b. Node list
- c. Primitive list
- d. None of these

2. Which of the following are type of linked list

- a. Single Linked List
- b. Circular Linked List
- c. Double Linked List
- d. All of above

3. Linked list is considered as an example of

- a. Static
- b. Compile time
- c. Heap
- <mark>d. Dynamic</mark>

4. DMA stands for

- a. Dynamite Memory Access
- b. Dynamic Memory Available
- c. Direct Memory Access
- d. None of Above

5. Dynamic memory allocation is

a. More efficient

- b. Less efficient
- c. Don't know
- d. None of above

6. Which function is used to delete the allocated memory space?

a. Dealloc()

<mark>b. free()</mark>

- c. Both A and B
- d. None of the above

7. Which of the following advantages of linked list over arrays?

- a. Dynamic Size
- b. Ease of insertion and deletion
- c. All of above
- d. None of above

8. Linked list can be represented in the memory using

a. One array

b. Two arrays

- c. Six arrays
- d. None of above

9. Which of the following operations is performed for visit nodes in linked list?

- a. Deletion
- b. User Define Function
- c. Traversing
- d. None of above

10. Which of the following operations is performed for visit nodes in linked list?

- a. Deletion
- b. User Define Function

c. Traversing

d. None of above

11. Searching in a linked list is

- a. Find element in linked list
- b. Find element in linked list and move element to another location
- c. Find element in linked list, if match found then the address of the node is returned otherwise we process the next node
- d. None of above

12. Searching in a linked list is

- a. Find element in linked list
- b. Find element in linked list and move element to another location
- c. Find element in linked list, if match found then the address of the node is returned otherwise we process the next node
- d. None of above

13. Insertion into linked list is process of

- a. Create a new linked list
- b. Insert a new node to linked list
- c. All of above
- d. None of above

14. Insertion in a linked list can be done at

- a. The beginning of linked list
- b. The end of linked list
- c. A particular position in linked list
- d. All of above

15. Deleting a node at the beginning is

a. Delete the first node of linked list

- b. Delete all nodes of liked list
- c. All of above
- d. None of above

16. Which of the following operation remove node from linked list?

- a. Traversing
- b. Inversing
- c. Deletion
- d. Insertion

<mark>UNIT 7</mark>

1. Which of the following statements about a doubly linked list is not correct?

- a. We can navigate in both the directions
- b. It requires more space than a singly linked list
- c. The insertion and deletion of a node take a bit longer
- d. None of above
- 2. 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

3. Traversing doubly linked list refer to visit each element of list.

- a. True
- b. False

4. In doubly linked lists, traversal can be performed?

- a. Only in forward direction
- b. Only in reverse direction

c. In both directions

d. None of the above

5. What is the worst case time complexity of inserting a node in a doubly linked list?

- a. O(nlogn)
- b. O(logn)
- <mark>c. O(n)</mark>
- d. O(1)
- 6. What is the functionality of following code?

```
public class insertFront(int data)
```

```
{
```

Node node = new Node(data, head, head, head, getNext());

```
node.getNext().setPrev(node);
```

```
head.setNext(node);
```

```
size++;
```

a. Insert a node at the beginning of the list

- b. Delete Node
- c. Traverse List
- d. None of above

7. Insertion into doubly linked list is

a. Insert new node

- b. Insert USB stick into CPU
- c. All of above
- d. None of above

8. Which of the following operations does a doubly linked list execute more efficiently than a singly linked list?

a. Deleting a node whose location in given

- b. Searching of an unsorted list for a given item
- c. Inverting a node after the node with given location
- d. Traversing a list to process each node

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a. Deleting a node whose location in given

- b. Searching of an unsorted list for a given item
- c. Inverting a node after the node with given location
- d. Traversing a list to process each node

10. Deletion at the beginning in the doubly linked list is possible.

<mark>a. True</mark>

b. False

11. Which of the following basic operation of doubly linked list is responsible for delete element from list?

- a. Insert a node
- b. Insert node at end
- c. Delete a node
- d. None of above

12. Deletion at the given position in the doubly linked list is possible.

<mark>a. True</mark>

b. False

13. Is there a linked list version in which the list's last node points to the list's beginning node?

- a. Singly linked list
- b. Doubly linked list
- c. Circular linked list
- d. Multiply linked list

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- a. Singly linked list
- b. Doubly linked list
- c. Circular linked list
- d. Multiply linked list

15. In circular linked list, insertion of node requires modification of?

a. One pointer

<mark>b. Two pointer</mark>

- c. Three pointer
- d. Requires no modification

16. A variant of the linked list in which none of the node contains NULL pointer is?

- a. Singly linked list
- b. Doubly linked list
- c. Circular linked list
- d. None of the above

17. Which of the following are disadvantages of circular linked list?

- a. Depending on the implementation, inserting at start of the list would require doing a search for last node which could be expensive.
- b. Finding the end of the list and loop control is harder (no NULL's to mark the beginning and end).
- c. All of above
- d. None of above

<mark>UNIT 8</mark>

1. What type of data structure does a Stack is?

a. Linear

- b. Non-linear
- c. Both Linear and Non-Linear
- d. None of above

2. It is impossible to do ____ operation on empty stack.

- a. PUSH
- <mark>b. POP</mark>
- c. STATUS
- d. None

3. Can we delete a node at front of a stack by using POP operation?

<mark>a. True</mark>

- b. False
- 4. At which position in the stacks, the operations are being done.

<mark>a. TOP</mark>

- b. SIZE
- c. POP
- d. PUSH

5. Other names for the insertion and deletion operations in Stacks?

a. PUSH – insertion, POP – Deletion.

- b. PUSH Deletion, POP Insertion.
- c. Both A and B are valid.
- d. None.

6. 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

7. A pointer variable which contains the location at the top element of the stack is called

<mark>a. Top</mark>

- b. Last
- c. Final
- d. End

8. A pointer variable which contains the location at the top element of the stack is called

<mark>a. Top</mark>

- b. Last
- c. Final
- d. End

9. is the term used to delete an element from the stack.

- a. Push
- b. Pull
- c. Pop
- d. Pump

10. The elements are removal from a stack in order.

a. Reverse

- b. Hierarchical
- c. Alternative
- d. Sequential

11. 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

12. 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

13. Choose the correct statement

- a. Linked list allocates the memory dynamically. However, the time complexity in both the scenario is the same for all the operations, i.e. push, pop and peek.
- b. Array allocates the memory dynamically. However, the time complexity in both the scenario is the same for all the operations, i.e. push, pop and peek.
- c. All of above
- d. None of above

14. Stack can be implemented using

- a. Array
- b. Linked list
- c. Both array and linked list
- d. None of above

15. The representation of stack can be done in

- a. One way
- <mark>b. Two ways</mark>
- c. Three
- d. None

16. Select true statement for implementation of stack using array is

- a. The stack is formed by using the array.
- b. All the operations regarding the stack are performed using arrays.

c. All of the above

d. None of the above

17. Select true statement for implementation of stack using array is

- a. The stack is formed by using the array.
- b. All the operations regarding the stack are performed using arrays.

c. All of the above

d. None of the above

18. Which of the following is true about linked list implementation of stack?

- a. In push operation, if new nodes are inserted at the beginning of linked list, then in pop operation, nodes must be removed from end.
- b. In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from the beginning.
- c. Both of the above
- d. None of the above

<mark>UNIT 9</mark>

1. A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a?

<mark>a. Queue</mark>

- b. Stack
- c. Tree
- d. Linked list

2. A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a?

<mark>a. Queue</mark>

- b. Stack
- c. Tree
- d. Linked list

4. Process of inserting an elements at the end of queue is known as?

- a. Dequeue
- <mark>b. Enqueue</mark>
- c. Push
- d. Pop
- 5. The maximum size of the queue?
 - a. Can be changed
 - b. Cannot be change
 - c. Independent
 - d. None of these

6. Application of queue is

- a. Serving request of a single shared resource, like a printer, CPU task scheduling
- b. Call center phone system using queue to hold people calling
- c. Handling of interrupt in real time system
- d. All of above

7. Which of the following is not a basic operation of a queue?

- a. enqueue()
- b. dequeue()
- <mark>c. input()</mark>

d. peek()

9. peek() function is

- a. This function helps to add the data at the front of queue.
- b. This function helps to delete the data at the front of queue.
- c. This function helps to see the data at the front of queue.
- d. None of above

10. isempty() function is

a. If the value of front is less than MIN or 0, it tells that queue is empty.

- b. If the value of rear is less than MIN or 0, it tells that queue is empty.
- c. All of above
- d. None of above

11. What kind of a data structure does a queue is?

<mark>a. Linear</mark>

- b. Non-linear
- c. Both Linear and Non Linear
- d. None

12. In linked list implementation of queue, if only front pointer is maintained, which of the following operation take worst case linear time?

- a. Insertion
- b. Deletion
- c. To empty a queue
- d. Both insertion and deletion

13. In Queue, ENQUEUE means _____ whereas DEQUEUE refers _____.

a. An insertion operation, a deletion operation.

- b. End of the queue, defining a queue.
- c. Traverse operation, Insert operation
- d. None of above

14. push() and pop() functions are found in

- a. Queue
- <mark>b. Stack</mark>
- c. Tree
- d. All of above

<mark>UNIT 10</mark>

1. Circular Queue is also known as ____

a. Ring Buffer

- b. Square Buffer
- c. Rectangle Buffer
- d. Curve Buffer
- 2. Circular Queue is also known as _____

a. Ring Buffer

- b. Square Buffer
- c. Rectangle Buffer
- d. Curve Buffer

3. 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

4. Choose the application of circular queue

- a. Looped execution of the slides of a presentation.
- b. Assigning turns to play for multiplayer gaming systems.
- c. Process management tasks by Operating System.
- d. All of above

5. Circular queues can also be represented in memory using following ways.

- a. Using contiguous memory allocation
- b. Using non-contiguous memory allocation
- c. Circular queue cannot be represented in memory
- d. Using contiguous and non-contiguous memory allocation
- 6. Circular queues can also be represented in memory using following ways.
 - a. Using contiguous memory allocation
 - b. Using non-contiguous memory allocation
 - c. Circular queue cannot be represented in memory
 - d. Using contiguous and non-contiguous memory allocation

7. A circular queue is one in which the insertion of a new element is done at the very first location of the queue if the last location of the queue is full.

- a. True
- b. False

8. 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
- <mark>c. Dequeue</mark>
- d. Priority queue

10. Similarly, in DEQUEUEs, insertion is performed at ____ end whereas the deletion is performed at ___ end.

- a. FRONT, REAR
- b. REAR, FRONT
- c. FRONT, REAR & REAR, FRONT
- d. None of the above

11. What the applications are of dequeue?

- a. A-Steal job scheduling algorithm
- b. Can be used as both stack and queue
- c. To find the maximum of all sub arrays of size k
- d. All of above
- 12. What is a dequeue?

a. A queue with insert/delete defined for both front and rear ends of the queue

- b. A queue implemented with a doubly linked list
- c. A queue implemented with both singly and doubly linked lists
- d. None of the mentioned



a. Insert at the front end of the dequeue

b. Insert at the rear end of the dequeue

- c. Fetch the element at the rear end of the dequeue
- d. Fetch the element at the front end of the dequeue

14. A function is called indirect recursive _____

a. If it calls the same function.

b. If it calls another function.

- c. Execute other function.
- d. Above all

15. Function which call itself is called_

- a. Static function
- b. Auto function
- c. Recursive function
- d. All of above

16. Which of the following statements is true?

- a. Recursion is always better than iteration
- b. Recursion uses more memory compared to iteration
- c. Recursion uses less memory compared to iteration
- d. Iteration is always better and simpler than recursion

17. Recursion is similar to which of the following?

a. Switch Case

<mark>b. Loop</mark>

- c. If-else
- d. if el if else

18. When any function is called from main(), the memory is allocated to it on the stack.

a. True

- b. False
- c. Can be true or false
- d. Neither true nor false

<mark>UNIT 11</mark>

1. Root is

a. The topmost node of a tree.

- b. The child node of a tree.
- c. The positive node of a tree.
- d. None of above.

2. Degree of a Node is

- a. The degree of a node is the X number of branches of that node.
- b. The degree of a node is the X+Y number of branches of that node.
- c. The degree of a node is the total number of branches of that node.
- d. All of above.

3. Which of the following is not a type of tree data structure?

a. General Tree

b. Primary Tree

- c. Binary Tree
- d. Binary Search Tree

4. Tree is a nonlinear data structure.

<mark>a. True</mark>

b. False

5. Choose the right statement about binary tree.

- a. Every node in a binary tree has a left and right reference along with the data element.
- b. A binary tree is a tree-type non-linear data structure with a maximum of two children for each parent.
- c. The node at the top of the hierarchy of a tree is called the root node. The nodes that hold other sub-nodes are the parent nodes.

d. All of above.

6. Which of the following is not component of binary tree.

- a. Data element
- b. Pointer to left subtree
- c. Pointer to right subtree
- d. Super tree

7. Binary tree can be represented using

- a. Arrays
- b. Linked list
- c. Both Array and Linked list
- d. None of above

8. Which of the following is application of binary search tree.

- a. In multilevel indexing in the database.
- b. For dynamic sorting.
- c. For managing virtual memory areas in Unix kernel.
- d. All of above.

9. Which of the following is way of tree traversal?

- a. In-order Traversal
- b. Pre-order Traversal
- c. Post-order Traversal
- d. All of above

10. Select the traversal method in which root is visited after visit left sub-tree and right sub-tree.

- a. In order Traversal
- b. Pre-order Traversal
- c. Post-order Traversal
- d. None of above

11. Select the traversal method in which root is visited after visit left sub-tree and right sub-tree.

- a. In order Traversal
- b. Pre-order Traversal
- c. Post-order Traversal
- d. None of above

12. Choose the tree traversal method from following

- a. Recursive
- b. Non Recursive
- c. Both recursive and non-recursive
- d. None of above

13. Post order traversal is

a. Traverse the left sub-tree, then traverse the right sub-tree, finally traverse the root

- b. Traverse the root, then traverse the right sub-tree, finally traverse the left sub-tree
- c. Traverse the left sub-tree, then traverse the right sub-tree
- d. Traverse root only

14. Node within a data structure.

- <mark>a. True</mark>
- b. False

15. Node within a data structure.

- a. True
- b. False

16. _____ is time complexity for insertion operation.

- a. O(n)
- <mark>b. O(1)</mark>
- c. O(n)
- d. None of above

17. O(n) is time complexity for

- a. Search Operation
- b. Insertion Operation
- c. Deletion Operation
- d. Merge operation

UNIT 12

1. A simple graph does not have which of the following properties?

a. Must be connected

- b. Must be unweighted
- c. Must have no loops or multiple edges
- d. Must have no multiple edges

2. A graph consist of the following components

- a. Vertices
- b. Edges
- c. Both edges and vertices
- d. None of above

3. Which of the following is true?

- a. A graph may contain no edges and many vertices
- b. A graph may contain many edges and no vertices
- c. A graph may contain no edges and no vertices
- d. A graph may contain no vertices and many edges

4. Which of the following is not a graph?



5. directed graph is

a. A graph contains ordered pair of vertices

- b. A graph contains 2 pair of vertices
- c. A graph contains vertices
- d. None of the above

6. The Depth First Search traversal of a graph will result into?

- a. Linked List
- <mark>b. Tree</mark>
- c. Queue
- d. Array

7. The data structure which is being used in DFS is _____.

<mark>a. Stack</mark>

- b. Tree
- c. Queue
- d. None of above

8. Choose the incorrect statement about DFS and BFS from the following.

- a. BFS is equivalent to level order traversal in trees
- b. DFS is equivalent to post order traversal in trees
- c. DFS and BFS code has same time complexity
- d. DFS is implemented using stack

9. Choose the correct statement from following

- a. Depth-first search is an algorithm for insert node into tree or graph data structures.
- b. Depth-first search is an algorithm for traversing or searching tree or graph data structures.
- c. DFS is delete first style from data structure.
- d. Depth-first search is an algorithm for count elements in the data structure.

10. In Depth First Search, how many times a node is visited?

- a. Once
- b. Twice
- c. Thrice
- d. Equivalent to number of in-degree of the node

11. The Data structure used in standard implementation of Breadth First Search is?

a. Stack

<mark>b. Queue</mark>

- c. Linked List
- d. Tree

12. What can be the applications of Breadth First Search?

- a. Finding shortest path between two nodes
- b. Finding bipartiteness of a graph
- c. GPS navigation system
- d. All of the mentioned

13. Choose the correct statement from following

- a. Breadth-first search is an algorithm for searching a tree data structure for a node that satisfies a given property.
- b. Breadth-first search is an algorithm used for insertion.
- c. Breadth-first search is an algorithm for delete an element from array.
- d. All of above

14. Which of the following is not an application of Breadth First Search?

- A. Finding shortest path between two nodes
- B. Finding bipartiteness of a graph
- C. GPS navigation system
- D. Path Finding

15. The data structure which is being used in DFS is stack.

- A. True
- B. False

<mark>UNIT 13</mark>

- 1. Which of the following is not a searching technique?
 - a. Linear Search
 - b. Binary Search
 - c. Queue Search
 - d. None of above
- 2. Where is linear searching used?
 - a. When the list has only a few elements
 - b. When performing a single search in an unordered list
 - c. Used all the time
 - d. When the list has only a few elements and when performing a single search in an unordered list

3. What is the best case for linear search?

- a. O(nlogn)
- b. O(logn)
- c. O(n)
- d. O(1)

4. What is the worst case for linear search?

- A. O(nlogn)
- B. O(logn)
- <mark>C. O(n)</mark>
- D. O(1)

5.

Search is often called sequential search

- a. Binary Search
- b. Linear Search
- c. Both linear search and binary search
- d. None of above

6. Linear search is mostly used to search an unordered list in which the items are not sorted.

- <mark>a. True</mark>
- b. False
- c. Sometimes true

- d. Sometimes false
- 7. Finding the location of a given item in a collection of items is called
 - a. Discovering
 - b. Finding
 - c. Searching
 - d. Mining

8. Which of the following algorithm type is iterative in nature?

a. Binary Search

b. Linear Search

- c. Both binary search and linear search
- d. None of the above

9. The binary search algorithm uses

- a. Linear way to search values
- b. Divide and conquer method
- c. Bubble sorting technique
- d. None of them

10. Best case complexity of binary search algorithm is

- a. O(1)
- b. O(log n)
- c. O(log n)
- d. O(1)

11. Average case complexity of binary search algorithm is

- a. O(1)
- b. O(log n)
- c. O(log n)
- d. O(1)

12. Average case complexity and worst case complexity of binary search algorithm are same

<mark>a. True</mark>

b. False

13. Worst case complexity of binary search algorithm is

a. O(1)

b. O(log n)

<mark>c. O(log n)</mark>

d. O(1)

14. Which of the following is right statement for binary search?

a. Binary search is a fast search algorithm with a run-time complexity of (log n).

- b. Binary search is a fast search algorithm with a run-time complexity of (m log n).
- c. Binary search is a fast search algorithm with a run-time complexity of (x log n).
- d. Binary search is a fast search algorithm with a run-time complexity of (log X).

15. Which from the following technique is used for finding a value from an array?

- a. Linear Search
- b. Binary Search
- c. Bubble sort
- d. All above

16. Which from the following technique is used for finding a value from an array?

- A. Linear Search
- B. Binary Search
- C. Bubble sort
- D. All above

UNIT 14

1. Selection sort is a simple sorting algorithm which finds the smallest element in the array and exchanges it with the element in the first position.

<mark>a. True</mark>

- b. False
- c. Sometimes true
- d. Sometimes false
- 2. In the following scenarios, when will you use selection sort?
 - a. The input is already sorted
 - b. A large file has to be sorted

c. Large values need to be sorted with small keys

d. Small values need to be sorted with large keys

3. What is the worst case complexity of selection sort?

- a. O(nlogn)
- b. O(logn)
- c. O(n)
- <mark>d. O(n2)</mark>

4. Shell sort algorithm is an example of?

a. External sorting

b. Internal sorting

- c. In-place sorting
- d. Bottom-up sorting

5. Shell short is also used for searching

a. True

b. False

6. Which of the following method is used for sorting in merge sort?

- a. Merging
- b. Partitioning
- c. Selection
- d. Exchanging

7. What will be the best case time complexity of merge sort?

a. O(n log n)

- b. O(n2)
- c. O(n2 log n)
- d. O(n log n2)

8. Which of the following is a stable sorting algorithm?

a. Merge sort

- b. Typical in-place quick sort
- c. Heap sort
- d. Selection sort

9. Which of the following sorting algorithm is in-place?

a. Counting sort

b. Radix sort

- c. Bucket sort
- d. None

10. Best case complexity of radix sort is

a. (n log n)

- b. n log n
- c. (nk)
- d. (n + k)

11. Which of the following is not a sorting technique?

- a. Bubble Sort
- b. Linear Sort
- c. Selection Sort
- d. Merge Sort

12. Bubble sort is

- a. Bubble sort is a type of sorting.
- b. It is used for sorting 'n' (number of items) elements.
- c. It compares all the elements one by one and sort them based on their values.
- d. All of above

13. What is the average case complexity of bubble sort?

- a. O(nlogn)
- b. O(logn)
- c. O(n)
- <mark>d. O(n2)</mark>

14. What is the average case complexity of bubble sort?

- a. O(nlogn)
- b. O(logn)
- c. O(n)
- <mark>d. O(n2)</mark>

15. Which of the following is correct with regard to insertion sort?

a. Insertion sort is stable and it sorts In-place

- b. Insertion sort is unstable and it sorts In-place
- c. Insertion sort is stable and it does not sort In-place
- d. None of above

16. Insertion sort sorting method sorts the array by shifting elements one by one.

- a. True
- b. False

17. Which of the following is correct with regard to insertion sort?

a. Insertion sort is stable and it sorts In-place

- b. Insertion sort is unstable and it sorts In-place
- c. Insertion sort is stable and it does not sort In-place
- d. None of above