TELANGANA UNIVERSITY
S.S.R. DEGREE COLLEGE, NIZAMABAD (C.C:5029)
III SEMESTER INTERNAL ASSESSMENT I EXAMINATIONS
COMPUTER SCIENCE (DATA STRUCTURES USING C++) QUESTION BANK

I. Choose the correct answers.   [c]

1. How can we describe an array in the best possible way?
a. The array shows hierarchical structures   b. Arrays are immutable
c. Container that stores the elements of similar types   d. The array is not a data structure

2. When the user tries to delete the element from the empty stack then the condition is said to be a
_____   [a]
a. Underflow   b. Garbage collection   c. Overflow   d. None of the above

3. If the size of the stack is 10 and we try to add the 11th element in the stack then the condition is known
as _____   [c]
a. Underflow   b. Garbage collection   c. Overflow   d. None of the above

4. Which one of the following is not the application of the stack data structure?   [d]
a. String reversal   b. Recursion   c. Backtracking   d. Asynchronous data transfer

5. Which data structure is mainly used for implementing the recursive algorithm?   [b]
a. Queue   b. Stack   c. Binary tree   d. Linked list

6. Which data structure is required to convert the infix to prefix notation?   [a]
a. Stack   b. Linked list   c. Binary tree   d. Queue

7. Which of the following is the infix expression?   [a]
a. A+B*C   b. +A*BC   c. ABC+*   d. None of the above

8. Which of the following is the prefix from of A+B*C?   [d]
a. A+(BC*)   b. +AB*C   c. ABC+*   d. +A*BC

9. If the elements '1', '2', '3' and '4' are added in a stack, so what would be the order for the removal?
[c]
a. 1234   b. 2134   c. 4321   d. None of the above

10. What is the outcome of the prefix expression +, -, *, 3, 2, /, 8, 4, 1 ?   [c]
a. 12   b. 11   c. 5   d. 4

11. A list of elements in which enqueue operation takes place from one end, and dequeue operation takes
place from one end is _____   [c]
a. Binary tree   b. Stack   c. Queue   d. Linked list

12. Which of the following principle does Queue use?   [b]
a. LIFO principle   b. FIFO principle   c. Linear tree   d. Ordered array

13. Which one of the following is not the type of the Queue?   [d]
a. Linear Queue   b. Circular Queue   c. Double ended Queue   d. Single ended Queue

14. The time complexity of enqueue operation in Queue is _____   [a]
a. O(1)   b. O(n)   c. O(logn)   d. O(nlogn)

15. Which one of the following is the correct way to increment the rear end in a circular queue?
[b]
a. rear = rear + 1   b. (rear+1) % max   c. (rear % max) + 1   d. None of the above

16. In the linked list implementation of queue, where will the new element be inserted?   [c]
a. At the middle position of the inked list   b. At the head position of the linked list
c. At the tail position of the linked list   d. None of the above

17. How many Queues are required to implement a Stack?   [b]
a. 3   b. 2   c. 1   d. 4

18. Which one of the following is not the application of the Queue data structure?   [d]
a. Resource shared between various systems   b. Data is transferred asynchronously
c. Load balancing   d. balancing of symbols

19. Which of the following principle is used if two elements in the priority queue have the same priority?

a. LIFO   b. FIFO   c. linear tree   d. None of the above

20. A linear data structure in which insertion and deletion operations can be performed from both the ends is _____   [b]

a. Queue   b. Deque   c. Priority queue   d. Circular queue

II. Fill in the blanks

1. The process in which a function calls itself is known as <u>Recursion</u>
2. <u>Data structure</u> is a way to store and organize data so that it can be used efficiently.
3. A data structure is called linear if all of its elements are arranged in the <u>Linear order</u>
4. An <u>Algorithm</u> is a process or a set of rules required to perform calculations or some other problem solving operations especially by a computer
5. An algorithm should be <u>Unambiguous</u> which means that the instructions in an algorithm should be clear and simple
6. <u>The time complexity</u> of an algorithm is the amount of time required to complete the execution
7. An algorithm's <u>space complexity</u> is the amount of space required to solve a problem and produce an output
8. Space complexity = <u>Auxiliary space + Input size</u>
9. <u>Flowchart</u> is a diagrammatic representation of sequence of logical steps of a program
10. An <u>Array</u> is a structure of fixed-size, which can hold items f the same data type
11. In the Deque implementation using singly linked list, <u>O(n)</u> be the time complexity of deleting an element from the rear end
12. The process in which a function calls itself is known as recursion and the corresponding function is called the <u>recursive function</u>
13. When function calls itself, it is called <u>direct recursion</u>
14. <u>isEmpty()</u> tests to see whether the queue is empty, It needs no parameters and returns a Boolean value
15. A circular queue is also known as <u>Ring Buffer</u>
16. The dequeue stands for <u>Double Ended Queue</u>
17. The <u>priority queue</u> supports only comparable elements, which means that the elements are either arranged in an ascending or descending order
18. Linked list can be defined as collection of objects called <u>nodes</u> that are randomly stored in the memory
19. The doubly linked list can be accessed in <u>both</u> directions
20. <u>Circular doubly linked list</u> is amore complexed type of data structure in which a node contain pointers to its previous node as well as the next node.

III. Short Answers.

1. Linear data structure.
A: A data structure is called linear if all of its elements are arranged in the linear order. In linear data structures, the elements are stored in non-hierarchical way where each element has the successors and predecessors except the first and last element.

2. Stack.
A: Stack is a linear list in which insertion and deletions are allowed only at one end, called top

3. Algorithm
A: The formal definition of an algorithm is that it contains the finite set of instructions which are being carried in a specific order to perform the specific task

4. List any 2 disadvantages of pseudo code.
A:
  ➢ The visual representation of the programming code can be easily understood, and the pseudocode doen't provide it.

> ➢ There is no well-defined format to write the pseudocode
> ➢ There are no standards available for pseudocode. Companies use their own standards to write it
> ➢ If we use pseudocode, we need to maintain one more document for our code

5. Flow chart?

A: Flowchart is a diagrammatic representation of sequence of logical steps of a program. Flowcharts use simple geometric shapes to depict processes and arrows to show relationships and process/data flow.

6. Circular Linked list

A: Circular doubly linked list is a more complexed type of data structure in which a node contain pointers to its previous node as well as the next node.

7. Single linked list

A: The singly linked list is a data structure that contains two parts, i.e., one is the data part, and the other one is the address part, which contains the address of the next or the successor node. The address part in a node is also known as a pointer.

8. Linked list

A: A linked list can also be defined as the collection of the nodes in which one node is connected to another node, and node consists of two parts, i.e., one is the data part and the second one is the address part.

9. What is recursion?

A: The process in which a function calls itself is known as recursion and the corresponding function is called the recursive function

10. Priority Queue

A: A Priority queue is a special type of queue in which each element is associated with a priority and is served according to its priority. If elements with the same priority occur, they are served according to their order in the queue