

### Sample Questions Data Structures - CSC305

1. Entries in a stack are “ordered”. What is the meaning of this statement?
  - a) A collection of stacks is sortable
  - b) Stack entries may be compared with the '<' operation
  - c) The entries are stored in a linked list
  - d) There is a Sequential entry that is one by one
2. Which of the following is not the application of stack?
  - a) A parentheses balancing program
  - b) Tracking of local variables at run time
  - c) Compiler Syntax Analyzer
  - d) Data Transfer between two asynchronous process
3. Which of the following statement is not true about Abstract Data Type  
Abstract data type gives overview of its data types and operations  
Abstract data type gives detailed implementation of its operations  
Abstract data type can be converted to desired programming language  
Abstract data type is mathematical model for a data structure
4. Here is an infix expression:  $4 + 3*(6*3-12)$ . Suppose that we are using the usual stack algorithm to convert the expression from infix to postfix notation. The maximum number of symbols that will appear on the stack AT ONE TIME during the conversion of this expression?
  - a) 1
  - b) 2
  - c) 3
  - d) 4
5. What data structure would you mostly likely see in a non recursive implementation of a recursive algorithm?
  - a) Linked List
  - b) Stack
  - c) Queue
  - d) Tree
6. The process of accessing data stored in a serial access memory is similar to manipulating data on a \_\_\_\_\_
  - a) Heap
  - b) Binary Tree
  - c) Array

d) Stack

7. If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?

- a) ABCD
- b) DCBA
- c) DCAB
- d) ABDC

8. A normal queue, if implemented using an array of size MAX\_SIZE, gets full when

- a)  $\text{Rear} = \text{MAX\_SIZE} - 1$
- b)  $\text{Front} = (\text{rear} + 1) \bmod \text{MAX\_SIZE}$
- c)  $\text{Front} = \text{rear} + 1$
- d)  $\text{Rear} = \text{front}$

9. Consider the following doubly linked list: head-1-2-3-4-5-tail What will be the list after performing the given sequence of operations?

```
Node temp = new Node(6, head, head.getNext());  
Node temp1 = new Node(0, tail.getPrev(), tail);  
head.setNext(temp);  
temp.getNext().setPrev(temp);  
tail.setPrev(temp1);
```

```
temp1.getPrev().setNext(temp1);
```

a) head-0-1-2-3-4-5-6-tail

b) head-1-2-3-4-5-6-tail

c) head-6-1-2-3-4-5-0-tail

d) head-0-1-2-3-4-5-tail

10. Consider an implementation of unsorted singly linked list. Suppose it has its representation with a head pointer only.

Given the representation, which of the following operation can be implemented in  $O(1)$  time?

- i) Insertion at the front of the linked list
- ii) Insertion at the end of the linked list
- iii) Deletion of the front node of the linked list
- iv) Deletion of the last node of the linked list

- a) I and II
- b) I and III

- c) I, II and III
- d) I, II and IV

11. In linked list implementation of a queue, where does a new element be inserted?
- a) At the head of link list
  - b) At the centre position in the link list
  - c) At the tail of the link list
  - d) At any position in the linked list
12. In linked list implementation of a queue, front and rear pointers are tracked. Which of these pointers will change during an insertion into a NONEMPTY queue?
- a) Only front pointer
  - b) Only rear pointer
  - c) Both front and rear pointer
  - d) No pointer will be changed
13. In linked list implementation of a queue, from where is the item deleted?
- a) At the head of link list
  - b) At the centre position in the link list
  - c) At the tail of the link list
  - d) Node before the tail
14. Which of the following is true about linked list implementation of queue?
- 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 beginning, then in pop operation, nodes must be removed from the beginning
  - c) In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from end
  - d) In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from beginning
15. What is not a disadvantage of priority scheduling in operating systems?
- a) A low priority process might have to wait indefinitely for the CPU
  - b) If the system crashes, the low priority systems may be lost permanently
  - c) Interrupt handling
  - d) Indefinite blocking
16. 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) A queue with insert/delete defined for front side of the queue
17. After performing these set of operations, what does the final list look contain?

```
InsertFront(10);  
InsertFront(20);  
InsertRear(30);  
DeleteFront();  
InsertRear(40);  
InsertRear(10);  
DeleteRear();  
InsertRear(15);
```

```
display();
```

- a) 10 30 10 15
- b) 20 30 40 15
- c) 20 30 40 10
- d) 10 30 40 15
18. Which of the following points is/are not true about Linked List data structure when it is compared with array?
- a) Arrays have better cache locality that can make them better in terms of performance
- b) It is easy to insert and delete elements in Linked List
- c) Random access is not allowed in a typical implementation of Linked Lists
- d) Access of elements in linked list takes less time than compared to arrays
19. Which of the following is false about a doubly linked list?
- 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) Implementing a doubly linked list is easier than singly linked list
20. The data structure required for Breadth First Traversal on a graph is?
- a) Stack
- b) Array
- c) Queue
- d) Tree
21. Linked lists are not suitable to for the implementation of?
- a) Insertion sort
- b) Radix sort
- c) Polynomial manipulation

d) Binary search

22. Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?

- a) Insertion Sort
- b) Quick Sort
- c) Heap Sort
- d) Merge Sort

23. 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

24. 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

25. B tree of order  $n$  is an Multiway tree in which each node has \_\_\_\_\_

- a) at most  $(n - 1)/2$  keys
- b) exact  $(n - 1)/2$  keys
- c) at least  $2n$  keys
- d) at least  $(n - 1)/2$  keys