Student Number:

Name:

Question 1

1.0 pts

What is the computational complexity of adding an item to a Queue in the worst case in terms of Big O notation?

○ O(1)

○ O(log n)

○ O(n)

○ O(n log n)

Question 2

1.0 pts

Consider the following operations on a stack

```
push(10);
push(5);
pop();
push(7);
pop();
pop();
push(24);
push(3);
```

After the completion of all operations, what will top() operation result in? (If results in an error, type "error" in the box)

Question 3

1.0 pts

Consider the following operations on a queue

```
enqueue(9);
dequeue();
enqueue(7);
enqueue(2);
dequeue();
enqueue(11);
enqueue(6);
```

After completing all of the operations, what value is at the front of the queue?

Question 4

1.0 pts

What is the computational complexity of adding an item to a Stack using a Linked List based implementation in the worst case in terms of Big O notation?

○ O(1)

○ O(log n)

○ O(n)

○ O(n^2)

Question 5

1.0 pts

What does the following pseudocode accomplish:

```
// pop() method returns an element and deletes it in the stack.
// push() method adds an element in the stack.
// dequeue() method returns an element and deletes it in the queue.
// queue() method adds an element in the queue

//Declare a stack and fill it.
Stack<int> stk

stk.push(6);
stk.push(3);
stk.push(8);
stk.push(2);

// Declare queue.
Queue<int> queue

// Mysterious functionality follows...
while(!stk.empty())
     queue.enqueue(stk.pop())

while(!queue.empty())
     stk.push(queue.dequeue())
```

○ Sorts the stack

○ Stack does not change

○ Reverses the stack

○ Doubles the elements in the stack

○ Ends with an empty stack

Question 6

1.0 pts

Which of the following statements about linked lists and arrays are TRUE?

- ○ Both data structures store elements sequentially (contiguously) in memory
- ○ Both are linear data types
- ○ Linked Lists are more efficient if you need random access
- ○ Linked Lists are more efficient if you have to access elements with O(1) time
- ○ Both data structures can use iterators

Question 7

1.0 pts

A SINGLE stack can be used to handle which of the following operations?

○ Balancing parenthesis

○ Task scheduling

○ Undo Feature

○ Evaluating expressions

Question 8

1.0 pts

What is the computational complexity of deleting an element from a doubly linked list with tail in the worst case in terms of Big O notation?

- ○ O(n)
- ○ O(n^2)
- ○ O(1)
- ○ O(logn)

Question 9

1.0 pts

Complete question 3.4 on Stepik: https://stepik.org/lesson/582916/step/2?unit=577646

No need to paste anything and we will enter your points here

Question 10

1.0 pts

Version control systems are used to keep track of file changes. Let us say that we are trying to build a new version control system called "GatorGit". An integral sub-component of this system is the diffchecker tool which compares the current file with the previous file version. For simplicity, lets consider all the files in the GatorGit system are documents represented by a **Singly Linked List**. Each line in the document is stored in one single node in the linked list and each line has at most ***n*** characters. Each document has at most ***m*** lines. Different documents can have different number of lines.

In this problem, you are supposed to write code for a simple diff-checker tool. Write a function using pseudocode that takes in as input these two documents and prints the lines that differ across the two documents along with the corresponding line number. Your function takes as arguments the head nodes of two documents, **Doc1** and **Doc2** implemented as a Singly Linked List. The function compares each line of the two documents in parallel, i.e. line by line. E.g. Line 1 of Doc1 is compared with Line 1 of Doc2; If the two lines differ, then print the two lines along with the corresponding line numbers otherwise move to the next line till you reach the end of the longer document. [5 points]

Also, comment on the computational complexity of your function in the best and worst case in Big O notation. [2 points]

Another Example:

```
Doc1
Hello World
This is great
Awesome

Doc2
Hello World
This is awful
Awesome

Output
2 This is great | This is awful

Explanation: Prints Line number, followed by Line in Document 1, followed by a s
```

Question 11

1.0 pts

Which of the following container(s) is/are List ADT implementation(s) in C++? [Select all that apply]

- ○ Vector
- ○ Forward List
- ○ main()
- ○ Iterator
- ○ Integer
- ○ Array

Question 12

1.0 pts

Doubly linked lists allow random access in the container in constant time.

○ True

○ False