Test 2 Sample questions:

1. ADT related questions:
   Example: A complex number consists of two components: the real component and the imaginary component. An example of a complex number is 2+3i, where 2 is the real component and 3 is the imaginary component of the data. Define a class MyComplexClass. It has two data values of float type: **real** and **imaginary.**

It has the following member functions:

- A **default constructor** that assigns 0.0 to both its real and imaginary data members;
- A **second constructor** that assigns client supplied values to the real and imaginary data members;
- A **member function "SetValues"** that assigns client supplied values to the real and imaginary data members; (This is not a constructor);
- A member function "**GetReal**" that returns the real component of the number;
- A member function "**Display**" that outputs the complex number in the form "a + bi" on screen, where a and b are the real and imaginary components.
- A **member function "EqualTo"** that compares two complex numbers. It returns true if they are the same, and returns false if they are different. Two complex numbers are considered the same if the real components of the two values are the same and the imaginary components of the two values are also the same.

You are required to:

(a) Write the complete header file for MyComplexClass; (you are not required to write comments)
(b) Write the complete implementation file for MyComplexClass.
(c) Write the client program to (1) Create two objects of MyComplexClass. One objects should be created using the default constructor, and the other with the value constructor; (2) Display each of the two complex numbers using the **Display** member function; (3) Apply **EqualTo** function to compare the two complex numbers and output appropriate messages concerning whether the two numbers are the same or not.

2. Write C++ client program code segments or functions using unsorted or sorted list class as discussed in class (similar to the functions you wrote for ola3)

3. Quiz 3 type of questions

4. Given an unsorted linked list, show C++ code to
   a. delete the first node in the list
   b. delete the k^{th} node in the list (position k could be in the middle, or at the end of the list)
   c. delete ALL the nodes in the list
   d. insert a new node with value 10 as the first node in the list
   e. insert a new node with value 5 as the last node in the list
   f. display the values in all the nodes
   g. find the sum of the values in all the nodes

5. Given a sorted linked list
   a. add a new node with value 3 such that after the insertion, the list is still sorted
   b. delete the node with value 8, display error message if no node in the list has a value of 8. Node with value 8 could be the first node in the list, a node in the middle of the list, or a node at the end of the list.

c. make a deep copy of the list