Name: _____

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**Quiz 1 – 25 points possible – 5 questions on 3 pages**

1. (9 pts) **Briefly** define the following:

   a) Abstract Data Type (ADT) *(source - lecture and textbook)*

   b) Black Box Design *(source - lecture)*

   c) Object Oriented Programming *(source - lecture and textbook)*

2. (3 pts) What condition in an application causes an exception to be thrown? *(source - textbook)*

3. (3 pts) What two things can happen after an application throws an exception? *(source - textbook)*

4. (5 pts) Given the following snippet of code:

```
int x = 1;
int* ptr1 = NULL;
int* ptr2 = 0;
int* ptr3 = &x;
int*ptr4 = x;
*ptr3 = 2;
```

Describe what the following statements will produce (either what will be printed or what will happen).

a) cout << *ptr1 << endl;

b) cout << *ptr2 << endl;

c) cout << *ptr4 << endl;

d) cout << ptr1 << endl;

e) cout << ptr2 << endl;

f) cout << ptr4 << endl;

g) cout << *ptr3 << endl;

h) cout << x << endl;

i) cout << ptr3 << endl;

j) cout << &x << endl;

5. (5 pts) Given an n-element unsorted linked list and a value ***k***, write a ***recursive*** function to find and return a pointer to the node containing the largest value less than ***k***. If no such value exists, return NULL. Your function may not use any global variables, that is, it can only use local variables and values passes as parameters. Use good programming style and write a general implementation. You must write code and not pseudo code. Syntax will be graded. *(source – textbook, modification of question C-4.4)*

You may assume that the following classes exist. The function you write will be a member function of the list class:

```
class List {
private:
        Node* head;
public:
        // your function
};
```

```
class Node {
public:
        Node* next;
        itemtype item;
};
```