Final
New Beginnings: Summer Practical Session

Name: _____;

1) C++ Programming… Logicals, If's and Loops

a. Write ONE IF STATEMENT to determine if a variable **(num)** is greater than 100

```
if (_____)
```

b. Write ONE IF STATEMENT to determine if a variable **(num)** is greater than 20 and less than 50

```
if (_____)
```

c. Write ONE IF STATEMENT to determine if a variable **(num)** is less than zero or greater than 80

```
if (_____)
```

d. Write ONE IF STATEMENT to determine if a variable **(num)** is not less than 5

```
if (_____)
```

2) C++ Programming… Functions

Write prototype statements for the following situations:

a) A function that returns a single character and takes an integer (by reference) as an argument:

_____ some_function (_____);

b) A function that returns nothing and takes a single character (by value) and a floating-point value (by reference) as arguments:

_____ some_function (_____);

c) A function that returns an integer and takes an array of character of size 20 as an argument

_____ some_function (_____);

d) A function that returns a real number and takes a struct Video by reference as an argument:

_____ some_function (_____);

e) A function that returns nothing and takes an array of struct Video of size 10 as an argument:

_____ some_function (_____);

3) **Structs -** Short Answer

a. The fields in a structure are called _____

b. Structs and class objects should always be passed to functions by. _____

c. An array of 10 structs has how many elements _____

- The first index of such an array is index _____
- The last index of such an array is index _____
- We need a _____ to keep track of how many elements are used (have data in them)

d. The beauty of a struct is that it can hold _____ types of data

4) **Pointers and Structs -** Short Answer

a. Create a pointer to an Animal:_____

b. Now show how to allocate an array of 10 Animals: _____

c. Show with pointer arithmetic, how to access the first animal in the array (to output the name):

cout << _____ **name;**

d. When we use the **->** operator, what type of data goes in front?

_____**->**name

e. When we use the **.** operator, what type of data goes in front?

_____**.** name

5) **Dynamic Memory -** Short Answer

a. Show an example of code that would cause a memory leak:

b. When is memory, which is allocated with **new**, deallocated?

c. A C++ class _____ is implicitly called when the lifetime of a class object is over (such as at the ending curly block for a local object)

d. Show how to allocate an array of characters DYNAMICALLY for "Computer Science":

_____

_____

_____

e. Show how to deallocate the array:_____

6) **Fundamentals of Linear Linked Lists -** Short Answer

a. A linear linked list has a _____ pointer, which points to the first node

b. A node has a _____ pointer, which points to another node in sequence

c. The last node is special because the _____ pointer must be _____

d. When we traverse, if we wanted to visit every node in the list we should traverse until current is _____

e. When we traverse to add at the end of a list, we should traverse until current->_____ is_____.

f. When we traverse to remove the last node, we need a pointer to which node's in the list _____ and. _____