Question 1.

```c
float f1 = 13.0;
float f2 = 5.0;
int j = f1/f2;
```

What is the value of \( j \)?

Question 2.

```c
char *cStr = “Prelim #1”;
```

What is the value of \( cStr[5] \)?

Question 3.
Declare (not define) a function named `increment` which returns a float and takes two floats (`arg1` and `arg2`) as parameters. `arg1` should be passed by reference, and `arg2` should have a default value of 1.
Question 4.

Given the following function definition:

```cpp
void decrement(int &value, int by)
{
    value -= by;
}

void main()
{
    int x = 5;
    int y = 2;

    decrement(x, y);
    cout << "x is : " << x << endl;
    cout << "y is : " << y << endl;
}
```

What are the values that are printed out?

x is : ________________

y is : ________________

Question 5.

Given the following code:

```cpp
int k = 0;
while (true)
{
    k++;
    switch (k)
    {
    case 1:
        cout << "t"; 
    case 2:
        cout << "h";
        break;
    case 3:
        cout << "i";
        continue;
    default:
        cout << "s";
        break;
    }
    if (k>=3)
        break;
}
```

What gets printed out? ____________________________
Question 6.

Complete the following for loop in the function “findChar” which is used to find the first occurrence of the specified character in the specified string. This function searches sequentially from the start of the string until the end looking for the specified character. Use the variable “j” in the for loop.

```c
int findChar(char *aStr, char searchChar)
{
    int length = strlen(aStr);

    for(          ;          ;          )
    {
        if (aStr[j] == searchChar)
            return j;
    }
    return -1;
}
```

Question 7.

Now, complete the following for loop in the function “findLastChar” which is used to find the last occurrence of the specified character in the specified string. This function searches sequentially from the end of the string to the beginning looking for the specified character. Use the variable “j” in the for loop.

```c
int findLastChar(char *aStr, char searchChar)
{
    int length = strlen(aStr);

    for(          ;          ;          )
    {
        if (aStr[j] == searchChar)
            return j;
    }
    return -1;
}
```
Question 8.

Given the following main() function:

```cpp
void main()
{
    int x = 5;
    int y = 6;

    {
        int y = 7;
        x = 2;
    }

    cout << "(x,y) is : (" << x << "," << y << ")" << endl;
}
```

What is printed out?

(x,y) is : ( _______ , _______ )

Question 9.

Define a class named Person which has two private member variables mName and mAddr (strings) and getters and setters for each (Don’t define the getters and setters, just declare them in the class definition)
Question 10.

Given the following partial class definition:

class MenuObject
{
    public:
        void setName(string argName);
        string getName();
        virtual int select()=0;
        virtual void display()=0;
    private:
        string name;
};

Please provide the definition of setName (assuming it is defined outside of the MenuObject class definition)

Question 11.

Given the following line of code:

    int *IntArray = new int[32];

provide the single line of code needed to free the memory pointed at by intArray (assuming the allocation succeeded):

________________________________________________________

Question 12.

What is wrong with the following function?

    Student *MakeStudent(string name, string addr)
    {
        Student newStudent(name, addr);
        return &newStudent;
    }

________________________________________________________
Question 13.

Given the following code:

```cpp
char *label="This is a test";
cout << 5[label] << endl;
```

What value is printed out?  _______________________

Question 14.

Give the single line of code needed to declare a variable of type “array of pointers to type char”. The variable’s name should be `charPtrArray`, the array size should be 5. The declaration should utilize the following typedef:

```cpp
typedef char *CharStarPtr;
```

Question 15.

Given the following class definitions:

```cpp
class X {
public:
    int q,r;
protected:
    int s,t;
private:
    int u,v;
};

class Y : public X {
public:
    int a,b;
    void foo();
};
```

What member variables of the base class `X` may be accessed from the definition of the member function `Y::foo()` ?

_____________________________
Question 16.

Given the following class definitions:

```cpp
class Person {
public:
    virtual void printName() {
        cout << "Name is: " << name << endl;
    }
    void setName(string argName) {
        name = argName;
    }
protected:
    string name;
};
class Student : public Person {
    void printName() {
        cout << "STUDENT: " << name << endl;
    }
};

And the following code...

```cpp```
void printIt(Person *aPerson) {
    aPerson->printName();
}

void main() {
    Student aStudent;
    aStudent.setName("John Doe");
    printIt(&aStudent);
}
```

What output is produced?
Question 17.

```java
enum RonsColors {
    ronsBlack,
    ronsRed = 6,
    ronsGreen,
    ronsBlue
};
```

What is the integer value of the constant `ronsBlack`?  

Question 18.

Given the class definitions provided in Question 16 and the following code:

```java
void printIt(Person aPerson)
{
    aPerson.printName();
}

void main()
{
    Student aStudent;
    aStudent.setName("John Doe");
    printIt(aStudent);
}
```

What output is produced?
Question 19.

Given the following code:

```cpp
class TestClass {
public:
    TestClass() {
        cout << "1 ";
    }
    ~TestClass() {
        cout << "2 ";
    }
};

void main() {
    cout << "3 ";
    TestClass *testClass = new TestClass();
    cout << "4 ";
    delete testClass;
}
```

What is the output?  

Question 20.

What is wrong with the following function declaration?

```cpp
int findLastCharacter(string s, char c, int start, stop=0);
```

Question 21.

A class that has at least one pure virtual function is called:
**Question 22.**

Given the following code:

```c
int doubleIt(int x)
{
    return 2*x;
}

main()
{
    int (*f)(int);
    f = doubleIt;
    // Call f here?
}
```

How do you call the function pointed at by the variable `f` with the value “5” as the sole parameter?

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**Question 23.**

Please complete the following operator overload which allows us to access and assign to individual characters in MyString. You need to supply the return type, the name of the operator to be overloaded and the argument passed to the overloaded operator. The name of the operator will be “[]” and the name of the argument passed in will be an integer “i”. Assume `badVal` is globally defined.

```c
MyString::
{
    if ( (i>=0) && (storagePtr) && (i < stringLength))
        return( storagePtr[i] );
    else
        return badVal;
}
```
Question 24.

An ofstream variable type is used to open a file for writing. Provide a declaration of a variable of type ofstream named “outFile” which opens a file named “output.dat”:

```cpp
ofstream outFile;
```

Question 25.

What’s wrong with the following function?

```cpp
void swap(const char *ptr, int j, int k)
{
    char temp = ptr[j];
    ptr[j] = ptr[k];
    ptr[k] = temp;
}
```