CS201 Introduction to Programming

Final Term Examination – Spring 2005
Time Allowed: 150 Minutes

Please read the following instructions carefully before attempting any of the questions:

1. Attempt all questions. Marks are written adjacent to each question.

2. Do not ask any questions about the contents of this examination from anyone.

a. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.

b. If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.

c. Write all steps, missing steps may lead to deduction of marks.

d. All coding questions should be answered using the **C ++** syntax.

You are allowed to use the Dev-C++ compiler to write and test your code. If you do so please remember to copy and paste your code into the examination solution area. **(Do NOT share your code; your colleague could get higher marks than you!!)**

**WARNING: Please note that Virtual University takes serious note of unfair means. Anyone found involved in cheating will get an `F` grade in this course.

Total Marks: 70   **Total Questions: 10**

Question No. 1	Marks : 02

A friend function

- must be having a prototype with no arguments
- must be invoked by the class that declares it a friend
- must be invoked by an object of the class that declares it a friend
- can access the private data of the class that declares it a friend
- cannot access the data members of a class

Question No. 2   Marks : 02

Which one of the following operators is a unary operator?

- OR (||)
- AND (&&)
- XOR (^)
- Complement operator (~)
- Insertion operator (>>)

Question No. 3   Marks : 10

Write a program that uses a function **multiple(int,int)** that determines for a pair of integers whether the second integer is a multiple of the first. The function should take two integer arguments and return 1 (true) if the second is a multiple of the first and 0 (false) otherwise. Use this function in a program that inputs a series of pairs of integers.

Question No. 4   Marks : 02

The *new* operator
- is used to declare objects or variables
- can not create and initialize an object
- names an object or variable
- returns an address to an object or variable
- can allocate an appropriate amount of memory for an object or variable

Question No. 5   Marks : 08

Write a program that uses a **function template** called **min** to determine the smaller of two arguments. Test the program using integer, character and floating point number pairs in main ().

Question No. 6   Marks : 20

Create a class named **Account**, its data members are

i. Account NO
ii. Account Title
iii. Balance

a) Create the object of this class using parameterized constructor in order to initialize all the three data members i.e. **Account NO. Account Title. Balance**

b) Write a member function of this class named **deposit ()**, this function will calculate the current balance for the user's account. In **deposit** function user will be prompted to enter the amount to be deposited and displays the incremented balance.

c) Write an other member function of this class named **addToFile()**, In this function write the values of the data members **Account NO, Account Title** and **Balance** in the file named **Account.txt.**

Also write the getter and setter functions for the data members of this class

Question No. 7	Marks : 02

If the statements
int j,k;
j = 123;
k= 234;
int* q, * r;
cout<<*q<<' '<<*r;
are executed, what will be displayed?

- o The values of j and k
- o The addresses of q and r
- o The addresses of j and k
- o 132 , 234
- o garbage values

Question No. 8	Marks : 15

Write a class **Rectangle** that performs the mathematical operations (**Subtraction and Multiplication**) on its height and width with the help of operator overloading.

Class **Rectangle** should have the following **Private data members**

1. height
2. width

a) Write a parameterized constructor to initialize the data members.
b) Write **member functions** to **Overload** the following **Operators** and **Display** the Results.

1. –
2. *
Implement the following checks in operator overloading functions:

i. Check for negative values in subtraction before and after the operation, change them into absolute values or negate them. (If width = -3 its absolute value is width=3.)

ii. Check for zero values in multiplication. If any value is zero, displays a message" Height or width cannot be zero". And exit from the function.

In **main ()** create the objects of the class and assign values to their data members and then call the overloaded operators

Question No. 9	Marks : 02

A copy constructor
- o takes no arguments
- o copies the data of any two constructors in that class
- o takes an arbitrary number of arguments
- o creates a new object that later may be assigned the data of an existing object
- o creates an object initialized with the same data as an existing object

Question No. 10	Marks : 07

Write the statements that will

a) declare a one-dimensional integer array with 8 elements

b) initialize each element in the array to 0

c) prompt the user for 8 integers and store those integers in the array

d) find the largest value in the array (use a loop)