

REGENT UNIVERSITY
COLLEGE OF SCIENCE AND TECHNOLOGY



EXAMINATION PAPER

END OF SEMESTER EXAMINATIONS,
NOVEMBER 2008

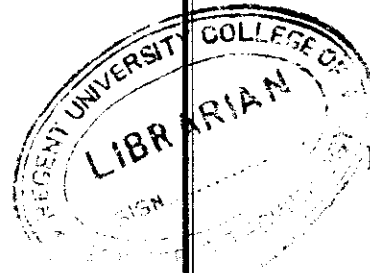
COURSE: OBJECT ORIENTED PROGRAMMING
USING C++

SICS 152

TIME: THREE HOURS

LECTURER: KENNETH K. AZUMAH

Please Read ALL Instructions



Attempt all questions.

Question 1 [15 marks max.]

a) What is the output when the following code fragment is executed? [3 marks]

```
int i = 5, j = 6, k = 7, n = 3;
cout << i + j * k - k % n << endl;
cout << i / n << endl;
```

b) Rewrite the following code fragment removing all the unnecessary tests from the nested conditional statement. [4 marks]

```
float income;
cout << "Enter your monthly income: ";
cin >> income;
if (income < 0.0)
    cout << "You are going farther into debt each month.\n";
else if (income >= 0.0 && income < 1200.00)
    cout << "You are living below the poverty line.\n";
else if (income >= 1200.00 && income < 2500.00)
    cout << "You are living in moderate comfort.\n";
else if (income >= 2500.00)
    cout << "You are well off.\n";
```

c) Answer the questions below concerning the following fragment of code. [8 marks]

```
int n;
cout << "Enter an integer: ";
cin >> n;
if (n < 10)
    cout << "less than 10" << endl;
else if (n > 5)
    cout << "greater than 5" << endl;
else
    cout << "not interesting" << endl;
```

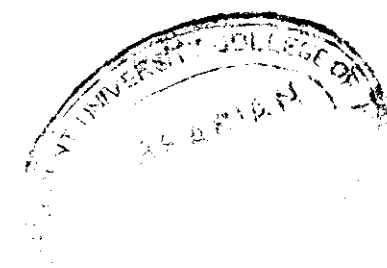
- i. What will be the output of the fragment above if the interactive user enters the integer value 0 ?
- ii. What will be the output of the fragment above if the interactive user enters the integer value 15 ?
- iii. What will be the output of the fragment above if the interactive user enters the integer value 7 ?
- iv. What values for n will cause the output of the fragment above to be "not interesting"?

d) Rewrite the following code fragment so that it uses a "do...while" loop to accomplish the same task.

```
int n;
cout << "Enter a non-negative integer: ";
cin >> n;
while (n < 0)
{
    cout << "The integer you entered is negative.\n";
    cout << "Enter a non-negative integer: ";
    cin >> n;
}
```

Question 2 [15 marks max.]

Consider the following UML class diagram:



BankAccount
-Balance : double
-AccNo : string
-AccName : string
+BankAccount(in accNum : string, in accName : string)
+Deposit() : void
+Withdraw(in amount : double) : double
+CheckBalance() : double
+ChangeName(in newName : string) : void

Represent the diagram fully in C++ code, implementing completely the operations. The name of the operations provides an idea of what it does.

Add useful comments to your code.

Question 3 [15 marks max.]

a) The Computer Science Department wants to sort a list of 95 student index numbers in ascending order. Complete the following fragment of code so that it prints out the required sorted list

```
#include <iostream>
#include <string>
using namespace std;

int main()
{
    string studentList[] = {"0220107", "3020107",
    "0011108" ,. . . , "0022105", "1010107"};
    string temp;
    for (int i =0; i<95; i++){
        for (int j = 0; j < 94; j++){
```

```
            if (studentList[j] > studentList[j+1]){
                .....
                .....
                .....
            }
        }
    }
    for (int i=0; i<95; i++){
        cout << studentList[i] << endl;
    }
    return 0;
}
```

b) A programme is to be designed where any word entered is to be printed out in a reverse column format. Write out a C++ programme to demonstrate this mentioned functionality. Put comments in your code. An example input and output is as follows:

Enter your word: PROGRAMME

E
M
M
A
R
G
O
R
P

Question 4 [15 marks max.]

Write out a C++ programme that to find the product of two 3x3 matrices. The programme should output the multiplying matrices (multiplicand and multiplier) and their product.