University Examinations 2012/2013

FIRST YEAR, SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MATHMATICS AND COMPUTER SCIENCE
AND
FIRST YEAR, FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
AND
SECOND YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE
AND
SECOND YEAR, FIRST SEMESTER EXAMINATION FOR THE BACHELOR OF SCIENCE IN BUSINESS STATISTICS

ICS 2104: OBJECT ORIENTED PROGRAMMING I

DATE: AUGUST 2012   **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE – 30 MARKS

a. Define the following terms: (3 Marks)
    i.   Syntax
    ii. Object code
    iii. Recursion
b. State three restrictions that apply to constructors and destructors. (3 Marks)
c. State one similarity and one difference between a record/struct and an array. (2 Marks)
d. Explain the concept of function overloading in C++ (2 Marks)
e. Do a walk through to find the value assigned to e. Assume that all variables are properly declared. Show all your working. (4 Marks)

a = 3;
b= 4;
c=(a%b)*6;
d= c/b;
e=(a+b+c)/4;

f. Explain the functions of the following manipulators. (6 Marks)
   i. Setprecision
   ii. Setw
   iii. Setfill

g. What will be the output when the following code executes. (4 Marks)

```cpp
#include<iostream.h>
void main()
{
    int i;
    for (i=12; i>=9; i--)
    cout<<"*";
    cout<<endl;
}
```

h. Using while write a C++ program that finds power of a given positive integer. (6 Marks)

QUESTION TWO – 20 MARKS

a. Explain five purpose of inheritance. (5 Marks)
b. Define the following terms: (3 Marks)
   i. Reference variable
   ii. Sentinel
   iii. Aggregate operation on an array
c. State four programming styles that are used to make a programs source code user friendly. (4 Marks)
d. State four advantages of using functions in a program. (4 Marks)
e. Explain how OOP is implemented in C++ (4 Marks)

QUESTION THREE – 20 MARKS

a. Differentiate between an operator and an operand giving an appropriate example. (4 Marks)
b. Define the following terms: (3 Marks)
   i. Data type
   ii. Identifier
   iii. Comment
c. Write the syntax for declaring a switch statement. (4 Marks)
d. State two conditions for a function to be termed recursive. (2 Marks)
e. Differentiate between pass by value and pass by reference as used in programming. (4 Marks)
f. Explain why and when do we use protected instead of private in classes. (3 Marks)

QUESTION FOUR – 20 MARKS

a. Define the following terms: (3 Marks)
   i. Control structures
   ii. Infinite loop
   iii. Expression
b. Declare integer variable **me** which is a reference variable to variable **you**. (3 Marks)

c. Using appropriate examples explain the following errors. (6 Marks)
d. Suppose x,y,z are simple Boolean expressions and all currently have the value FALSE. How should the following expression evaluate? Show all your working. (3 Marks)
NOT X OR Y AND Z
e. Differentiate between a structured data type and a simple data type. (2 Marks)
f. Explain the concept of encapsulation as used in OOP. (3 Marks)

QUESTION FIVE – 20 MARKS

a. Write a C++ program that uses a while loop to find power of a given positive integer i.e (a^b) (8 Marks)
b. Differentiate between single inheritance and multiple inheritances. (2 Marks)
c. Define the following terms: (3 Marks)
   i.   Parameterized constructor
   ii. Destructor
   iii. Global variable
d. Write a C++ program to display the following pattern. (7 Marks)
x
x x
x x x
x x x x
x x x x