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University Examinations 2013/2014

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

ICS 2104 / BIT 2109: OBJECT ORIENTED PROGRAMMING I

DATE: APRIL 2014 **TIME: 2 HOURS**

Instruction: *Question one is compulsory then select two questions among question two, three, four and Five questions*

QUESTION ONE (30 MARKS)

a) State three characteristics of object oriented programming. (3 marks)

b) Define the following terms. (3 marks)

i. Reference variable
ii. Sentinel
iii. Aggregate operating on an array

c) Define a constructor and state three of its features. (3 marks)

d) Using appropriate examples explain the following errors. (6 marks)

i. Syntax error
ii. Run time Error
iii. Logical Error

e) Suppose X, Y and Z are integer variables and W and T are double variables. What value is assigned Z, W and T after the last statement executes. (3 marks)

```
X = 17;
Y = 15;
X=X + Y/4;
Z=X% 3+4;
W=17/3 + 6.5;
T= X/4.0 + 15% 4-3.5;
```

f) State the output of the following statement. (2 marks)

```
For (i=1; i<=5; I ++)
{
Cout <<''*'';
I=i+1;
}
Cout <<endl;
```

g) Consider the following declarations

```
Class X class
{
Public :
        Void func ( );
        Void print ( ) const;
        Xclass ( );
        Xclass (int,double);
Private :
        Int u;
        Double w;
        };
        And assume that the following statement is in a user program:
        Xclass x;
```

i. How many members does class Xclass have? (1 mark)
ii. How many private members does class Xclass have? (1 mark)
iii. How many constructors does class Xclass have? (1 mark)
iv. Write the definition of the member function func so that u is set to 10 and w is set to 15.3. (2 marks)

h) Write a C++ program using switch statement that displays: (5 marks)

4.0 when A is entered
3.0 when B is entered
2.0 when C is entered
1.0 when D is entered
0.0 when E is entered

QUESTION TWO (20 MARKS)

a) State two conditions for recursion. (2 marks)

b) Differentiate between pass by value and pass by reference as used in programming. (4 marks)

c) Explain why and when do we use protected instead of private. (3marks)

d) Assume a class A has private, protected and public members and class B inherits from class A. state the access specifier for each of the members inherited when B has inherited through. (6 marks)

i. Private derivation mode
ii. Protected derivation mode

e) Write a C++ program to display the following pattern. (5 marks)

X

XX

XXX

XXXX

XXXXX

QUESTION THREE – 20 MARKS

a. Define the following terms (3 marks)
   i. Infinite loop
   ii. Class
   iii. Data abstraction

b. State the role of # include directive in C++ (3 marks)

c. Declare integer variable **me** which is a reference variable to variable **you**. (3 marks)

d. Using Class name A, Class name B and Class name C write the syntax for a multi-level inheritance. (4 marks)

e. Write a program in C++ that declares three arrays: one to hold the names of five products, the second to hold the prices of each of the products and the third to hold the quantity of each of the products. The program should then accept user input and display the product name, its quantity, its price and its total value. i.e Diary 750 10 7500. (7 marks)

QUESTION FOUR – 20 MARKS

a. State two advantages of inheritance. (2 marks)

b. State three restrictions that apply to constructors and destructors. (3 marks)

c. State one similarity and one difference between a record and an array. (2 marks)

d. A linear search algorithm when given an array of elements will compare the search element with the first array element, and then the second and so on until the last array element is reached. Write a program that declares and initializes an array to hold ten integer elements, accepts a user input search element, the program declares a function to implement linear search. Your program should return the index of the element if it is found or a message saying the search element was not found. (7 marks)

e. Using a while loop write a C++ program that finds power of a given positive integer. (6 marks)

QUESTION FIVE – 20 MARKS

a. State the name and explain when you use the :: Operator in C++? (3 marks)

b. Suppose A,B and C are integer variables and a=5 and b=6. What value is assigned to each variable after each statement executes? If a variable is undefined at a particular statement, write undefined. (9 marks)

	A	B	C
A= (B++) + 3;	…	…	…
C=2*A + (++B);	…	…	…
B=2*(++C)-(A++)	…	…	…

c. Write the syntax of a value returning function (2 marks)

d. Write a program that defines a class circle, which has three member attributes: radius, area and circumference and four member functions: input, getArea, getCircumference and output. The program should then create two objects of the class. (6 marks)