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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY  
UNIVERSITY EXAMINATION, 2016/2017 ACADEMIC YEAR  
FIRST YEAR, SECOND SEMESTER EXAMINATION  
FOR THE DEGREE OF BACHELOR OF SCIENCE  
(COMPUTER SCIENCE)**

Date: 8<sup>th</sup> August, 2016.  
Time: 2.00pm – 4.00pm

**KCS 102 - OBJECT ORIENTED PROGRAMMING I**

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

- a) Define and explain three benefits s of inline functions. (8 Marks)
- b) Discuss the benefits of Object Oriented Programming. (6 Marks)
- c) Explain the difference in the properties of following two derived classes;
- i) Class X : public A{///  
ii) Class Y : private A{///  
(4 Marks)
- d) Distinguish between multiple inheritance and hierarchical inheritance. (4 Marks)
- e) Explain how you can model a sphere as a class, and translate your model into C++ class. (8 Marks)

**QUESTION TWO (20 MARKS)**

- a) Define the term polymorphism and discuss how it is achieved. (8 Marks)
- b) Define the class Person which has name (char\*) and age (int), with a default constructors (6 Marks)

- c) The table below shows the base class visibility. Complete the table by writing the derived class visibility;

Base Class Visibility	Derived Class Visibility	
	Public Derivation	Private Derivation
Private	-	-
Protected	-	-
Public	-	-

(6 Marks)

### **QUESTION THREE (20 MARKS)**

- a) Describe the difference between publicly derived inheritance and privately derived inheritance (8 Marks)
- b) Create a class Patient that stores the patient name (a string) and the disease (a string) of the patient. From this class derive two classes: Inpatient which has a data member room rent (type float) and Outpatient which has a data member OPD - charges (float). Each of these three classes should have a non default constructor and a put data () function to display its data. Write a main () program to test In\_ patient and Outpatient classes by creating instances of them and then displaying the data with put data ().

(12 Marks)

### **QUESTION FOUR (20 MARKS)**

- a) Define the term constructor. (2 Marks)
- b) Explain the features of constructors in C++. (8 Marks)
- c) Consider the following C++ declaration and answer the questions given below;

```

class A
{
void any();
protected:
inta,b;
void proc();
public:
A();
void get();
void put();
};
class B:protected A
{
intc,d;
protected:
inte,f;
void get2();
public:
B();
void put2();
};
class C: private B
{
int p;
protected:
int q;
void get3();
public:
void show3();
};

```

- i) Name all the member functions which are accessible by the objects of class C. (4 Marks)
- ii) Name all the protected members of class B. (2 Marks)
- iii) Name the base class and derived class of class B. (2 Marks)
- iv) Name all the protected members of class C. (2 Marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain four features of;
- i) Structured programming
  - ii) Object oriented programming
- (8 Marks)
- b) Distinguish between Static and Dynamic binding. (4 Marks)
- c) Define the term friend function and illustrate how it is declared in a class (8 Marks)