THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME: LEVEL 04
NO BOOK TEST - 2: 2015/2016
CPU2242: OBJECT ORIENTED PROGRAMMING USING C++ AND JAVA
DURATION: **ONE AND HALF HOURS (1 1/2 HOURS)**

Date: 14th May, 2016 **Time: 10.30 am – 12.00 noon**

Answer ALL questions.

Q1.

a) Write five (05) advantages of using object-oriented programming over procedure-oriented programming.

b) Briefly explain the following terms in object-oriented programming.

i. Encapsulation

ii. Inheritance

iii. polymorphism

c) Explain the following basic concepts of object-oriented programming using an example.

i. Classes

ii. Objects

d) Define a class to represent a bank account which includes the following members.

Data members:

- Name of the depositor
- Account number
- Type of account (current, saving, etc.)
- Balanced amount in the account

Member functions:

- To assign initial values
- To deposit an amount
- To withdraw an amount after checking the balance
- To display name and balance

Q2.

a) Explain different types of inheritance with suitable examples.

b) What are the various types of access specifiers of base class? Explain their usage with an example for each.

c)

Create a base class called **shape** which includes the following members:

- Two double type value that could be used to compute the area of a figure.
- Member function to initialize the base class data members.
- Member function `display_area()` to compute and display the area of the figure.

Derive two classes called **triangle** and **rectangle** from the base class **shape**. Make `display_area()` as a virtual function and re-define this function in the derived classes to compute the area of each figure.

(*Hint:* Area of rectangle = $x * y$

Area f triangle = $\frac{1}{2} * x * y$)

Q3.

a) What is meant by operator overloading?

b) Explain unary and binary operator overloading with an example for each.

c) What is the friend function? List out its advantages over a normal function.

d) Write a member function or a friend function to add two complex numbers (complex number contains real and imaginary parts) by overloading + operator.