(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1433 Roll No.

M.C.A

(SEM III) ODD SEMESTER THEORY EXAMINATION 2009-10

OBJECT ORIENTED SYSTEMS AND C++

Time : 3 Hours] *[Total Marks : 100*

Note : *(i) Attempt all questions.*

(ii) Each question carries equal marks.

1 Attempt any **four** parts of the following : 5×4

(a) What is Object Oriented Modeling (OOM) ? List different steps involved in OOM process.

(b) What is multiplicity in associations ? Give example to explain multiplicity.

(c) Explain how you can define an object model of a system.

(d) Suppose that a computer is built out of one or more CPUs, sound card and video. Model the system with represenatative classes and draw the class diagram.

(e) Explain the following with example :

(i) Meta data

(ii) Candidate keys

(f) Explain different forms of association with example.

Attempt any **four** parts of the following : 5×4

(a) Draw an object model for sales order system.

(b) What is a state chart diagram ? Draw a state diagram for a mobile phone.

(c) Give a concurrent substates diagram for classroom and exam held.

(d) Draw an event trace and scenario for using a telephone line.

(e) Explain the following :

(i) Process

(ii) Data flows

(iii) Actor

(iv) Data stores

(f) Explain the use of constraints in functional model with suitable example.

Attempt any **two** parts of the following : 10×2

(a) Using the quadratic formula as a starting point, prepare a data flow diagram for computing the roots of the quadratic equation $ax^2 + bx + c = 0$. Real numbers, a, b and c are inputs. Outputs are values of $x = R_1$ and $x = R_2$.

(b) Write a C++ program to compute the following expression : $d = a + b + c$ where a, b, c and d are complex numbers.

(c) If class D is derived from two base classes B_1 and B_2, then write these classes each containing a zero-argument constructor. Ensure that while building an object of type D firstly the constructor of B_2 should get called followed by that of B_1. Also provide a destructor in each class. In what order would these destructors get called ? Write a complete C++ program for the above.

4 Attempt any **two** parts of the following : **10×2**

(a) (i) Draw a DFD for computing mean of a sequence of values.

(ii) What do you mean by persistence ? How will you make your data persistent ?

(b) Write a C++ program that contains a class *derived*, from *base*. The *base* class should have a virtual function *fun ( )* and it should be overridden in *derived*. Call *fun ( )* from the constructor of the *derived* class and show the output.

(c) Write short notes on any **two** of the following :

(i) Friend function

(ii) Polymorphism

(iii) Class template.

5 Attempt any **two** of the following : **10×2**

(a) (i) List the steps which a designer must perform during object design.

(ii) Differentiate between OO development form structured development.

(b) Explain Jackson structured development (JSD), a software engineering approach with a suitable example.

(c) Explain different object modeling constructs in brief.