Bengal Engineering and Science University, Shibpur

5th Semester B.E.(I.T) examination 2012-13

Object Oriented Methodology and Programming (IT-505)

Time – 3 hours
Total marks – 70

Answer **any Five** Questions

1. a) state the significance of the following in context of object oriented programming:
   i. Modularity ii. Reusability iii. Compatibility iv. Efficiency
   b) Define data abstraction, type abstraction and statement abstraction with suitable examples in relation to Object oriented programming.

   8+6 = 14

2. a) State the advantages of object oriented programming in comparison to procedural programming methodologies.
   b) What is data encapsulation and how is it implemented in Object oriented design?
   c) ' Objects are primary units of decomposition ' – Justify .

   6+4+4 = 14

3. a) Define the steps involved in Object oriented analysis and Object oriented design.
   b) What are the components of Use case diagrams in UML ?
   c) Distinguish between sequence and collaboration diagrams used in UML.

   5+4+5 = 14

4. a) Briefly define the goals of UML.
   b) In context of State diagrams define the following :
      i. Composite states and sub states ii. Events and triggers
   c) Why Object diagrams are used in UML? How they are different from class diagrams.

   4+5+5 = 14

5. a) State an use of friend function in context of operator overloading with a suitable Example.
   b) What is multiple inheritance ?
   c) Define the name conflict problem in relation to multiple Inheritance and the methods to resolve it.
   d) Why are namespaces used in C++? How are they different from classes?

4+3+3+4 = 14

6. a) Define polymorphism and its applications in C++ with a suitable example.
   b) What is early binding and late binding in context of polymorphism?
   c) How are constant objects initialized using constructors?
   d) Why are reference variables used as arguments for defining copy constructors?

4+4+3+3 = 14

7. a) Design an use case model for a Hospital management system using UML notations clearly defining the actors and use cases .
   b) Draw the sequence diagram for the following use cases modeled in hospital management system .
      i. Admission of a patient ii. Treatment and diagnosis at OPD.
   c) Write program in C++ to design a Class Vector representing a 3D vector . Write member functions for the Vector class to accomplish the following:
      i. Addition ii. Scalar product iii. Vector product

3+4+7 = 14

8. Write short notes on **any two** of the following:

   a) Includes and extends relationship in UML b) Virtual functions and abstract base class c) Activity diagrams in UML d) Aggregation and Inheritance

7+7 = 14