

Total number of printed pages—4

53 (CS 511) OOAD

2014

**OBJECT ORIENTED ANALYSIS  
& DESIGN**

**Paper : CS 511**

*Full Marks : 100*

Time : Three hours

*The figures in the margin indicate full marks  
for the questions.*

*All questions are compulsory.*

1. Attempt **any three** from the following : 6×3

(a) Write a C++ class illustrating how function overloading can be implemented.

(b) Write a C++ program to show how the + operator can be overloaded to add two complex numbers.

(c) Write a C++ program to show how inheritance is used to achieve class hierarchy.

Contd.

- (d) Show with an example how data hiding can be implemented in C++.
- (e) Write a C++ program to show constructor overloading can be implemented.
2. Under what circumstances should a prototype be developed? What are the *two* approaches adopted for prototyping in software development? 4+6

*Or*

Explain why the Spiral Model (Spiral Development Lifecycle) is suitable for development of technically challenging software products. 10

3. A client wants you to develop a mobile application which will allow parents to monitor their child's academic performance and extra-curricular activities in school. Which development model would you prefer and why? 6
4. Attempt *any two* questions from the following : 5×2
- (a) What are common coupling, control coupling and message coupling?

- (b) What is the advantage of having low coupling among various modules of a system ?
- (c) How is the coupling metric of a software system calculated if I/O data/control parameters, global variables, fan-in and fan-out for the system are known ?
5. Write short notes on : (*attempt any four*) 6×4
- (a) Coupling and cohesion
  - (b) Composition and aggregation
  - (c) UML Sequence diagram
  - (d) UML Object diagram
  - (e) UML Deployment diagram.
6. “An Android app has to be developed so that the students of CIT can reserve and renew library books using their phones. This app will also facilitate students to check availability of books. The librarian will use this app to update book records and manage other library related work. The system admin will be able to add and remove students and faculty members whenever required. An auxiliary system will be responsible for backing up the information every night.”
- (a) Design use-case diagrams for the system. 8

- (b) Propose the class structure by designing a class diagram(s). 8
7. Explain how messages are numbered to represent their sequence in collaboration diagrams. 6
8. What do Swimlanes represent in an Activity diagram ? How are the relationships between the various action states of an entity represented in Activity diagrams ? In what way can Activity diagrams be considered similar to statechart diagrams ? 3+4+3