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53 (CS 511) OOAD

2016

**OBJECT ORIENTED ANALYSIS  
AND DESIGN**

Paper : CS 511

Full Marks : 100

Time : Three hours

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

Answer **any five** questions.

- (a) Distinguish between object-oriented analysis and object-oriented design. Which of the two requires more creative talents of the system developers? Justify. 5+3=8
- (b) What is the role of UML in OO design? Discuss the structural and behavioral building blocks of UML. 4+8=12

Contd.

2. (a) Why is it necessary to overload an operator? Design a class polar which describes a point in the plane using polar coordinates radius and angle. Write a C++ program to add two objects of polar overloading the '+' operator.  $2+8=10$
- (b) When will you make a function inline? Why? 4
- (c) What is a virtual base class? When do we make a class virtual?  $4+2=6$
3. (a) Write suitable programs which correctly explain
- (i) Object as function argument
- (ii) Array of objects  $5+5=10$
- (b) In what order the class constructors called when a derived class object is created? Give suitable example. 6
- (c) Write a short note on pure virtual function. 4
4. (a) What is use case modeling? Differentiate between the following in use case diagrams:
- (i) uses and extends
- (ii) actor and user.  $2+6=8$

(b) Draw the top level use cases for a web customer making purchases online.

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(c) What do you mean by association in a class diagram? What are its types? Differentiate them with suitable example.

2+6=8

5. (a) Consider the following statement of requirements of a Library system.

The Library contains books and journals. It may have several copies of a given book. Some of the books are for short term loans only. All other books may be borrowed by any library member for three weeks.

Members of the library can normally borrow upto six items at a time, but members of staff may borrow upto twelve items at one time. Only members of staff may borrow journals. The system must keep track of when books and journals are borrowed and returned.

Draw a class diagram for the above statement.

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- (b) What is the importance of state chart diagram? What do you mean by the terms action, event and guard? Describe with suitable example.  $3+9=12$
6. (a) What is the need of 'swimlanes' in activity diagram? Construct activity diagram with swimlanes for ATM system.  $2+8=10$
- (b) Explain collaboration diagram with a suitable diagram. How messages are numbered to represent their sequence in collaboration diagrams.  $6+4=10$
7. Write short notes on the following:  
**(any two)**  $10 \times 2 = 20$
- (i) Component diagram
- (ii) SDLC
- (iii) Memory allocation for objects in C++
- (iv) Deployment diagram.