B5.2-R3: OBJECT ORIENTED DATABASE MANAGEMENT SYSTEMS

NOTE:

1. **Answer question 1 and any FOUR questions from 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

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

1. Briefly explain the following:

a) Compare object oriented design with procedure-oriented design.
b) Define classes, abstract classes and interfaces and explain their utility.
c) What is meant by separation of interface and implementation in object-oriented design?
d) Distinguish between coupling and cohesion. Which is encouraged by object-oriented technology?
e) Distinguish between a function call and message dispatch.
f) Distinguish between method overloading and method-overriding.
g) Explain static and dynamic binding.

(7x4)

2.

a) Define inheritance relationship, composition relationship and association relationship in object-oriented technology. Also define and discuss their role in system development.
b) Explain single and multiple inheritances and how Java supports them. Illustrate with suitable examples
c) Define inheriting rule, subtype rule and method selection rule. Explain with examples.

(6+6+6)

3.

a) Distinguish between procedural programming paradigm and object-oriented programming paradigm. What are the benefits of object-oriented programming over procedural programming?
b) Explain static and dynamic polymorphism with suitable examples.
c) Explain abstraction and encapsulation concepts in object-oriented technology with a suitable example. Can abstraction and encapsulation be achieved in C programming language? If yes, then illustrate with an example in C otherwise explain.

(4+6+8)

4.

a) What is OMG? Explain in brief.
b) What is an ORB and what are its functions?
c) What is CORBA? Give a brief explanation about the CORBA and its architecture.
d) What are CORBA services? Explain with some example.

(3+3+6+6)

5. Consider the following details of a database system, which is required by an academic institute to automate many of its administrative activities. Carryout the questions (a), (b) and (c) listed below:

- The database system caters to the needs of three types of members – faculty, student and staff members.
- All members have a name (string), an address (string) and an Id (integer). In addition, faculty-members have a few research interests (an array of strings) and Office-telephone number (integer); student-members have an academic program number (integer) and staff-members have an employee-number (integer).

a) Identify the features of the above systems, which would help in object-oriented design.
b) How the above object-orientation can be supported in SQL? List the characteristic features of SQL to deal with object-orientation.
c) Create an object-oriented database schema definition for this database.

(6+6+6)

6.

a) What is object serialization? How is the concept linked to object-persistence? How does a persistent programming language help in object-oriented databases?
b) Differentiate between a relational database and object-relational database models.
c) Using description given in question 5, describe how does the concept of an object in the object-oriented model differ from the concept of an entity in the entity-relationship model?

(6+6+6)

7.

a) How are large objects such as multimedia objects are stored in object-oriented database systems? Explain in details.
b) If an object is created without any reference to it how can it be deleted?
c) Distinguish between relational database and object-relational database models.
d) Explain in brief the features of deductive databases.

(6+4+4+4)