B4.3-R4: OBJECT ORIENTED DATABASE MANAGEMENT SYSTEMS

NOTE:

1. **Answer question 1 and any FOUR from questions 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.

a) What is meant by procedure language? How can it be compared with Object Oriented approach?
b) Enumerate the pros and cons of using persistent objects in OODBMS.
c) Justify how Object-Oriented concepts be expressed as a language.
d) Define the common framework for defining semantic models.
e) Elucidate the technical challenges in Information Integration.
f) Identify the situations in which XML columns are used to store data.
g) Enumerate the two lifetimes supported in the Object model. Compare them.

(7x4)

2.

a) Discuss on the approaches used to map a Database schema to an XML schema with diagrams wherever necessary.
b) Elaborate on the Home grown applications and XML wrapper methods to access data in a file system.

(9+9)

3.

a) Brief about the essential characteristics of Object-Oriented data models.
b) Explain the design strategies in OOP.
c) Compare and contrast the OO features in C++, Smalltalk and Java.

(6+6+6)

4.

a) Develop the E-R model for the following case-study:
Assume that the statements given here were obtained as a result of interviews with the library staff, with some database terminology inserted by the interviewer.

- A PUBLICATION entity has TITLE and AUTHOR attributes.
- BOOKS, JOURNAL-PAPERS, and CONFERENCE PAPERS are particular kinds of PUBLICATIONS.
- A BOOK entity has SALES, TOPIC, AUTHOR, PRICE, PUBLISHER, INTEREST-INDEX, and ACQUISITION- PRIORITY attributes.
- A BEST-SELLING-BOOK has SALES greater than 10,000.
- A WRITER entity has INCOME, NAME, and STIPEND attributes.
- The AUTHOR attribute of BOOK is of type WRITER.
- A PUB-HOUSE entity has NAME and GROSS attributes.
- A PERSON entity has a NAME attribute.
- A REVIEWER entity has a STIPEND attribute.
- A LITERARY-FIGURE is both a WRITER and a REVIEWER.
- A BORROWED entity has PUBLICATION and DUE-DATE attributes.
- A LIBRARY entity has ACQUISITIONS and ORDERED-PUB-LIST attributes.
- The set of DATABASE-BOOKS contains all BOOKS with TOPIC = DATABASE and also has a TOTALCOST attribute.
- The set of AI-BOOKS contains all BOOKS with TOPIC = AI.
- The BOOKS in the set of GOODBOOKS are identified by the end user.
- The set DB-AI-GROUP-BOOKS consists of BOOKS in both DATABASE-BOOK and ABOOK.
- All BOOKS in the set RESEARCHGROUP-COLLECTIONS are GOOD-BOOKS.
- WROTE is a relationship between BOOK and AUTHOR.

- PUBLISHED is a relationship between BOOK and PUB-HOUSE.
- REVIEW is a relationship between BOOK and REVIEWER with attributes RATING and DATE.
- A REVIEWER is a PERSON.
- HOLD is a relationship BOOK and LIBRARY.

b) Discuss with necessary examples and neat figures the steps involved in transforming an ODMG Object Model to C++.

(9+9)

5.

a) Differentiate between Relational and Object Oriented Database System.

b) Compare the Booch and Shlaer/Meelor notation based on the Analysis/Design notations and the processes involved.

(9+9)

6. What are the limitations of the Relational Model? What is the motivation and advantages for semantic database models and object oriented database models in comparison with the relational model? What are the object / entry type hierarchies and explain their characteristics.

(18)

7.

a) Discuss the various SQL operations on object relational data.

b) Compare ORDBMS & Semantic DBMS in detail. Also provide illustrations to understand the concept of the two DBMS.

(9+9)