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 separation of interface and implementation in object-oriented design?

b) What is the virtual member function? What is the implementation difference between calling a virtual function compared to calling a normal function?

c) What is well formed XML document? How it is different from validated XML document?

d) Explain with an example "Booch methodology" for object oriented (OO) design.

e) Explain the concepts: encapsulation, generalization and polymorphism. How the above concepts support reusability.

f) Can we declare the constructor private? What happen if we do this?

g) For which category of application, the use of object data management is more appropriate? State any three relevant applications pertaining to the use of object data management principles.

(7x4)

2.

a) State the new kinds of data types supported in object-oriented database system. Give an example for each and discuss how the example situation would be handled if only RDBMS were available.

b) Discuss the extensions that are needed to query processing and query optimization so as to fully support the Object Relational Database Management Systems (ORDBMS)?

(8+10)

3.

a) Define inheritance relationship, composition relationship and association relationship in object-oriented technology. Also define and discuss their role in system development.

b) Prepare an Object diagram for a graphical document editor that supports grouping, which is a concept used in a variety of graphical editors. Assume that a document is composed of several sheets. Each sheet contains drawing object, including text, geometrical objects and groups. A groups is simply a set of drawing objects, possibly including other groups. A group must contain at least two drawing object. A drawing object can be a direct member of at most one group. Geometrical objects include circles, ellipse, rectangles, lines and squares.

(8+10)

4.

a) What is the difference between Object Oriented Database and Object Relational Database systems? Which of them are considered to provide better protection and inheritance?

b) What is semantic metadata? How to capture the semantic of the object in object oriented database management system using semantic metadata model?

c) What is object serialization? How is the concept linked to object-persistence? How does a persistent programming language help in object-oriented databases?

(6+6+6)

5.

a) How are large object such as multimedia objects are stored in object-oriented database systems? Explain in details.

b) In UML, interaction between objects may be modeled using sequence diagram or collaboration diagrams. Describe and differentiate both diagrams.

c) What is the content of XML documents? What is specified by Document Type Declaration (DTD)?

(4+8+6)

6.

a) Explain Terms: Class, Attributes and Relationship in ODL. What is Inverse Relationships and Multiplicity of relationship in ODL? Give example of both.

b) What is Semi Structured Data Model? What does the Semi-Structured Data Model do? Compare and Contrast Semi Structured model with relational model? What are the issues with Semi-Structured Data?

c) What is meant by "Overloading of a Function"? When it is used?

(6+8+4)

7.

a) What is Persistent Programming Language? How do they make object persistent? Differentiate between transient and persistent object.

b) Group the following terms under Aggregation or Generalization
   i) a-kind-of
   ii) a-part-of
   iii) is a
   iv) or
   v) and
   vi) part whole

c) What is the importance of checkpoints in the database management system? How checkpoints are used in the system log file of database management system?

(6+6+6)