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 primary characteristics should an OID possess?
b) How document similarity is measured?
c) What is the ratio of the size of CUBE(F) to the size of F is fact Table F has ten dimension attributes, each with ten different values.
d) What are the differences and similarities of attribute and relationship properties of user-defined class?
e) Define Materialized view? How is this used in information integration?
f) What are collection hierarchies? Give an example that illustrates how collection hierarchies facilitate querying.
g) State the differences between data-centric and document centric XML documents.

(7x4)

2.

a) How is linear recursion used for specifying recursive queries? Illustrate with an example.
b) Discuss how a DBMS exploits encapsulation in implementing support for ADTs.
c) Compare RDBMSs with ORDBMSs. Describe an application scenario for which you chose ORDBMS and explain why?

(6+5+7)

3.

a) Explain, in detail, Booch Methodology for OO design.
b) State the need of using DTD for XML? Explain the format and various attributes of DTD with examples.
c) Define multiple inheritance. Discuss different types of multiple inheritance by providing one example for each type.

(6+7+5)

4.

a) How binary relationship and referential integrity are represented in an object oriented data model. Explain them with examples.
b) Compare relationships representation in OO data model with Relational model.
c) How persistent programming language features make object persistent? Explain.

(8+6+4)

5.

a) Suppose a student_t type should have a person_t type within it, as well as an integer student_ID, an email name, and an expected year of graduation, an integer. The person_t object should be non-null. Define the student_t type and table students using the student ID as the primary key.
b) State the need for Object Query Language? Explain, with an example, the definition of the REF object reference.
c) Define nested relation. Explain, with an example, how to create nested relations using features of SQL.

(6+6+6)

6.

a) Define Information integration. Discuss any three approaches for Information integration.

Computer Company XYZ keeps data about the PC models it sells in the schema:
Computers(number, proc, speed, memory, hd)
Monitors(number, screen, MaxResX, MaxResY)

A tuple (123, PIII, 1000,128,40) in Computers means that model 123 has pentium III processor running at 1000 meghahertz, with 128M of memory and a 40G hard disk. The tuple (456, 19, 1600, 1200) in Monitors means that model 456 has a 19inch screen with a maximum resolution of 1600 x 1200.

Another company PQR only sells complete systems, consisting of a computer and monitor and its schema is Systems (id, processor, mem, disk, screensize)

i) If Company XYZ wants to insert into its relations information about the corresponding items from PQR, what SQL insert statements should it use?
ii) Suggest a global schema that would allow you to maintain as much information as possible about products sold by companies XYZ and PQR.

b) How are large objects (LOBs) such as multi media objects are stored in Object oriented database systems. Discuss with an example.

([6+4+4]+4)

7.

a) Describe Object Exchange Model (OEM) for semi structure data representation. Explain its features with an example.
b) Explain, with examples, various OLAP operators.
c) Suppose a company wants to design a data warehouse to facilitate the analysis of moving vehicles in an OLAP manner. The company registers huge amounts of auto movement data in the format of (Auto_ID, location, speed, time). Each Auto_ID represents a vehicle associated with information (eg., vehicle_category, driver_category) and each location may be associated with a street in a city. Assume that a street map is available for the city. Design a data warehouse to facilitate effective OLAP in multidimensional space.

(7+6+5)