Exam.Code:0999
Sub. Code: 34962

2076

M.E. (Computer Science and Engineering)

First Semester

CS-8102: Advance Databases

(For UIET Only)

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

1. Attempt *any five* of the following:-

   (a) Define logical and physical data independence with examples.

   (b) What is BCNF? Give one example where 3NF fails but BCNF succeeds.

   (c) What is a schedule? Define conflict serializability.

   (d) Differentiate OODB and ORDBMS in two points.

   (e) Explain horizontal fragmentation with an example.

   (f) What is a checkpoint? Why is it needed during recovery? (5x2)

UNIT - I

2. (a) What is normalization? Normalize the following relation up to 3NF:
   R(StudentID, Name, Course, Instructor, InstructorPhone)

   (b) How is a horizontal partitioning of a relation specified? How can a relation be put back together from a complete horizontal partitioning? (2x5)

3. (a) Explain the Distributed Query processing techniques in detail.

   (b) What is the difference between data centric and document centric XML documents? (2x5)

4. (a) Differentiate between Object-Oriented Databases (OODB) and Object-Relational Databases (ORDBMS).

   b) Explain OQL with suitable examples. (2x5)

P.T.O.

UNIT - II

5. (a) A database uses Two-Phase Locking (2PL).

For the following operations, state whether a deadlock will occur. If yes, identify the cycle.

T1: Lock-S(A) → Lock-X(B)

T2: Lock-X(B) → Lock-S(A)

(b) A retail company wants to build a Data Warehouse. Given:

4 store locations

Each generates 10,000 transactions/day

Fact size per transaction = 500 bytes

Calculate weekly warehouse size and suggest a storage strategy to optimize cost and performance. (2x5)

6. (a) The system crashes after the following log entries:

<START T1>

<WRITE T1 X old=10 new=15>

<START T2>

<WRITE T2 Y old=30 new=45>

<COMMIT T1>

---- CRASH ----

Using Deferred Update, find the final values of X and Y after recovery.

(b) Explain lock-based concurrency control and timestamp-based concurrency control. Mention one advantage of each. (2x5)

7. (a) Given an XML document of a "Product" list, write:

i) XPath expression to select all products priced above 10000

ii) XQuery to count the total number of products for a brand = "Samsung"

(b) What is the difference between distributed processing in computing systems and DDBMS? Under what circumstances would you choose a DDBMS over distributed processing? (2x5)

x-x-x