

2074

**M.E. (Computer Science and Engineering)
First Semester
CS-8102: Advanced Databases
(For UIET Only)**

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting two questions each from Section B-C.

x-x-x

Section A(10 marks)

Q1) Compare and contrast the following:

- i) Snowflake, Star Schema (2 marks)
- ii) OLAP, OLTP (2 marks)
- iii) Data Warehouse, Data Mart (2 marks)
- iv) ROLAP, MOLAP, HOLAP (2 marks)
- v) Forward and backward recovery (2 marks)

Section B(20 marks)

Q2) a) What is KDD? Explain all steps in detail. (4 marks)

b) Compare, contrast various data mining techniques along with respective application areas. (6 marks)

Q3) a) What is Coarse and fine granularity? Explain with an example that how Multi Granularity protocol ensures serializability, no deadlock, recoverability and cascadeless ness. (5 marks)

b) Explain Lock and timestamp based ordering implementation for Multiversion concurrency control techniques with example.(5 marks)

Q4) a) Give Various architectures of Distributed Databases.Explain their working (6 marks)

b) Compare and Contrast the various data distribution strategies for Distributed Database. (4 marks)

Section C(20 marks)

Q5) Create an object model for a University Course Management System. The system should handle different course categories, student registrations, and faculty assignments. Additionally, consider the availability of various resources such as classrooms and course materials.

(I) Design an ODL schema reflecting the essential entities and relationships.(5 marks)

(II) Write 2 OQL operations to showcase the system's functionality, such as retrieving student schedules or finding available classrooms. (5 marks)

Q6)a) Compare Deferred and Immediate recovery techniques. Explain the significance of checkpoints in both recovery processes. (3 marks)

b) Provide advantages and disadvantages of both log-based recovery and shadow paging.(2 marks)

c) Explain functionality of 2-phase commit and 3-Phase commit protocols for recovery in distributed databases.How both responds to the following failures: (5 marks)

- i) Failure of participating site
- ii) Failure of Coordinator

Q7) Write a very brief note on the following. (10 marks)

- a) Temporal Databases
- b) Deductive Databases
- c) Spatial Databases
- d) Multimedia Databases

x-x-x