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MCS-207

**POST GRADUATE DIPLOMA IN
COMPUTER APPLICATIONS/
MASTER OF SCIENCE
(DATA SCIENCE AND ANALYTICS)
(PGDCA-NEW/MSCDSA)
Term-End Examination**

June, 2026

**MCS-207 : DATABASE MANAGEMENT
SYSTEMS**

Time : 3 Hours

Maximum Marks : 100

Weightage : 70%

Note : *Question No. 1 is compulsory and carries
40 marks. Attempt any **three** questions
from Question Nos. 2 to 5.*

1. (a) Describe file based system. Also list the limitations of it. 5
- (b) Discuss the role of data models in developing DBMS. Compare conceptual models with object based models. 5
- (c) Define super key and primary key. Can a composite key be a primary key ? Justify. 5
- (d) Why do we need relational algebra in DBMS ? List the Relational operations and Binary set operations. 5
- (e) Illustrate the conversion of ER diagram to Relational database. How does DBMS differ from RDBMS ? 5
- (f) Compare fixed length records with variable length records. How is the storage of these two types of records performed on HDD or SSD ? Discuss. 5

- (g) Describe Unordered Heap file organization. Give advantages and disadvantages of heap files. 5
- (h) Describe insertion anomaly and deletion anomaly in database with suitable example for each. 5
2. (a) Define 3 NF and BCNF. What are trivial functional dependencies and transitive functional dependencies ? How are they related to 3 NF and BCNF ? 10
- (b) Describe dependency preserving decomposition with suitable example. 5
- (c) Explain the rules of data normalization. 5
3. (a) What are views in DBMS ? How do views differ from tables in DBMS ? Can we perform insert, delete and modify

operations, if the view contains group by clause ? Justify. Also, give advantages of views. 8

(b) Differentiate between : 8

(i) Stored Procedures and Triggers.

(ii) Primary Indexes and Secondary Indexes.

(c) What is a transaction in DBMS ? List the properties of transactions. When the transactions are said to be concurrent ?

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4. (a) Differentiate between serial schedule and serializable schedule. How can it be assured that a schedule is serializable or not ? Describe the role of locks in assuring serializability. 8

(b) What is recovery in databases ? Briefly discuss. Explain log based recovery with suitable example. 8

- (c) Briefly discuss optimistic concurrency control technique. 4

5. Write short notes on following : 4×5=20

- (a) Wound-wait scheme for Deadlocks
- (b) Role of checkpoints in Recovery
- (c) Relationship between Database security and Integrity
- (d) Data warehousing life cycle

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