



Paper id: 252750

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Subject Code: KCA204

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MCA
(SEM II) THEORY EXAMINATION 2024-25
DATABASE MANAGEMENT SYSTEMS

TIME: 3 HRS**M.MARKS: 100****Note:** Attempt all Sections. In case of any missing data; choose suitably.**SECTION A****1. Attempt all questions in brief.****2 x 10 = 20**

Q No.	Question	CO	Level
a.	What is a Database? How is it different from a File System?	1	K1
b.	What is a Super Key? How is it different from a Candidate Key?	1	K1
c.	What is Referential Integrity? Give an example.	2	K2
d.	Write the syntax and example of a nested subquery.	2	K1
e.	Define Functional Dependency with an example.	3	K3
f.	What is the difference between 3NF and BCNF?	3	K2
g.	Define a Transaction and its ACID properties.	4	K1
h.	What is the purpose of Checkpoints in DBMS?	4	K2
i.	What is Concurrency Control? Why is it needed?	5	K1
j.	Define Lock-based Protocol.	5	K1

SECTION B**2. Attempt any three of the following:****10 x 3 = 30**

a.	Explain the three-level architecture of DBMS with a neat diagram.	1	K2
b.	Describe basic Relational Algebra operations with examples.	2	K3
c.	Explain the process of Normalization up to BCNF with suitable examples.	3	K2
d.	Explain the concept of Serializability with examples of serial and non-serial schedules.	4	K3
e.	Explain the Two-Phase Locking Protocol (2PL) and its variants.	5	K3

SECTION C**3. Attempt any one part of the following:****10 x 1 = 10**

a.	Describe the ER Model. Draw an ER diagram for a hospital management system and convert it into tables.	1	K3
b.	Explain Generalization, Specialization, and Aggregation with examples.	1	K3

4. Attempt any one part of the following:**10 x 1 = 10**

a.	Write SQL queries to perform Insert, Update, Delete, and Join operations on Employee and Department tables.	2	K5
b.	Explain Tuple Relational Calculus and Domain Relational Calculus with examples.	2	K4

5. Attempt any one part of the following:**10 x 1 = 10**

a.	Normalize the given relation up to 3NF: Student(RollNo, Name, Dept, Course, Instructor, Instructor Phone)	3	K4
b.	Discuss the various types of Dependencies: FD, MVD, and JD.	3	K3

6. Attempt any one part of the following:**10 x 1 = 10**

a.	What is a Deadlock? Explain deadlock detection and prevention techniques.	4	K2
b.	Explain the architecture and characteristics of Distributed Databases.	4	K4

7. Attempt any one part of the following:**10 x 1 = 10**

a.	Explain how Recovery is handled in case of concurrent transactions.	5	K3
b.	What is Multiple Granularity Locking? How does it improve concurrency?	5	K3