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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA (Integrated)

SEM: IV - THEORY EXAMINATION (2025 - 2026)

Subject: Data Base Management

Time: 2.5 Hours

Max. Marks: 60

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

15

1. Attempt all parts:-

- (1.1) A collection of related data is called _____ (CO1,K1) 1
- (a) Database
- (b) Program
- (c) Transaction
- (d) Network
- (1.2) An association between two or more entities is termed a _____.(CO2,K1) 1
- (a) Attribute
- (b) Relationship
- (c) Constraint
- (d) Key
- (1.3) Boyce–Codd Normal Form (BCNF) operates on _____ normal form.(CO3,K1) 1
- (a) first normal form
- (b) second normal form
- (c) third normal form
- (d) all of above
- (1.4) Select operation is denoted by _____.(CO4, K1) 1
- (a) R
- (b) σ
- (c) P
- (d) S
- (1.5) The real use of the Two-phase commit protocol is _____ (CO5,K1) 1

- (a) Deadlock will not occur
- (b) Concurrency control can be avoided
- (c) Atomicity, i.e, all-or-nothing commits at all sites
- (d) None of the above

2. Attempt all parts:-

- (2.1) Define the durability property of a transaction.(CO1, K1) 2
- (2.2) Explain the importance of data models in DBMS.(CO2,K2) 2
- (2.3) Define First Normal Form (1NF) with a suitable example.(CO3,K1) 2
- (2.4) Differentiate between Relational Algebra and Relational Calculus.(CO4, K2) 2
- (2.5) Define deadlock in transaction management.(CO5,K1) 2

SECTION-B

15

3. Answer any three of the following:-

- (3.1) Discuss the concepts of transaction management in DBMS and explain the ACID properties with examples.(CO1, K3) 5
- (3.2) Explain the degrees of data abstraction in DBMS with examples.(CO2,K2) 5
- (3.3) Define Boyce-Codd Normal Form (BCNF). Explain how BCNF is a stronger form of 3NF and provide a scenario where a relation might be in 3NF but not in BCNF.(CO3,K4) 5
- (3.4) Given relations `SUPPLIER(SID, SName, City)` and `PARTS(PID, PName, Color)` and `SHIPMENTS(SID, PID, Quantity)`. Write a relational algebra expression to find the names of suppliers in 'London' who supply 'Red' parts. (CO4,K3) 5
- (3.5) Explain the role of checkpoint in a log based recovery with the help of an example. (CO5,K2) 5

SECTION-C

30

4. Answer any one of the following:-

- (4.1) Explain the purpose of a database system and discuss the advantages of DBMS over file processing systems.(CO1,K2) 6
- (4.2) Discuss the architecture of Database Management System.(CO1,K2) 6

5. Answer any one of the following:-

- (5.1) Explain various types of data models used in DBMS.(CO2,K2) 6
- (5.2) Describe the role of business rules in database design.(CO2,K2) 6

6. Answer any one of the following:-

- (6.1) Draw the ER diagram for a company . Company needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments, each department is managed by an employee, a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company. (CO3,K5) 6
- (6.2) Explain the conditions required for a relation to be in 2NF with an 6

example. Differentiate between First Normal Form (1NF) and Second Normal Form (2NF).(CO3,K2)

7. Answer any one of the following:-

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|-------|---|---|
| (7.1) | Explain different types of joins in Relational Algebra with suitable examples.(CO4, K2) | 6 |
| (7.2) | Differentiate between TRC(Tuple Relational Calculus) and DRC(Domain Relational Calculus) with examples. Write TRC queries for retrieve details of students scoring more than 75 marks from a student(RollNo, Name, Course, Marks) database. (CO4, K3) | 6 |

8. Answer any one of the following:-

- | | | |
|-------|---|---|
| (8.1) | Explain ACID properties of transactions with suitable examples.(CO5, K2) | 6 |
| (8.2) | Explain deadlock in DBMS and describe methods for deadlock handling and prevention.(CO5,K2) | 6 |

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