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BTECH
(SEM VI) THEORY EXAMINATION 2024-25
BASICS OF DATA BASE MANAGEMENT SYSTEM

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.	Define a Database Management System (DBMS).	1	K1
b.	What is a primary key? How is it different from a candidate key?	2	K2
c.	Define aggregation in ER diagram.	2	K1
d.	Differentiate between a relation and a relational schema.	2	K2
e.	What is referential integrity?	2	K1
f.	What is the difference between selection and projection operations?	3	K2
g.	What is the purpose of normalization in database design?	4	K2
h.	What is the difference between DELETE and TRUNCATE?	3	K2
i.	What are the four properties (ACID) of a transaction?	5	K1
j.	What is the use of the GRANT and REVOKE commands in SQL?	5	K2

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

Q No.	Question	CO	Level
a.	How is an ER diagram converted into relational schema? Illustrate with an example.	2	K3
b.	Explain the basic operations of relational algebra with suitable examples.	3	K2
c.	Differentiate between conflict serializability and view serializability with suitable examples.	5	K2
d.	Compare and contrast OODB and XML databases. Provide scenarios for their usage.	5	K2
e.	Write short notes on: a) Schema vs Instance, b) Super key vs Candidate key.	2	K2

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

Q No.	Question	CO	Level
a.	Define functional dependency and explain how it is used in normalization.	4	K3
b.	Write SQL queries to create, modify, and drop tables. Include constraints such as primary key, unique, and foreign key.	3	K3

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

Q No.	Question	CO	Level
a.	What is data independence? Differentiate between logical and physical data independence.	2	K2



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b.	Consider the following schema: Employee(EmpID, Name, Department, Salary, ManagerID) Write SQL queries to: a) Find the names of employees working in the 'IT' department. b) List employees whose salary is greater than 50,000. c) Find the average salary of each department.	3	K3
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5. Attempt any one part of the following:**10 x 1 = 10**

Q No.	Question	CO	Level
a.	Given a relation R(A, B, C, D, E) with the following functional dependencies: A → B BC → D D → E a) Find candidate keys b) Is the relation in 1NF, 2NF, or 3NF? Justify your answer. c) Normalize the relation to 3NF.	4	K3
b.	What is recoverability in transactions? Explain types of recoverable schedules with examples.	5	K2

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

Q No.	Question	CO	Level
a.	Given a relation R(A, B, C, D, E) with FDs: A → B B → C C → D D → E a) Find the minimal cover of the FDs. b) Determine candidate keys for the relation.	4	K3
b.	Define BCNF and explain how it differs from 3NF with examples.	4	K2

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

Q No.	Question	CO	Level
a.	Compare and contrast a database system with a file system. Highlight their advantages and disadvantages.	1	K2
b.	Explain locking techniques used for concurrency control. Include binary locks and shared/exclusive locks.	5	K2