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Subject Code: BOE067

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BTECH

(SEM. VI) THEORY EXAMINATION 2025-26

BASICS OF DATA BASE MANAGEMENT SYSTEM

TIME: 3 HRS **M.MARKS: 70**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2x7 = 14**

(a)	Define Primary Key , foreign key and its purpose.	CO-1	K2
(b)	Briefly explain metadata and data dictionary.	CO-1	K2
(c)	Differentiate between Natural Join, and Theta Join.	CO-2	K2
(d)	Explain any four Aggregate Functions?	CO-3	K2
(e)	What is the difference between DROP and TRUNCATE?	CO-3	K2
(f)	Define data warehouse.	CO-4	K1
(g)	Define Transaction and Explain the ACID properties.	CO-5	K1

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

(a)	Analyze the role of a Database Administrator (DBA). What are their primary responsibilities regarding security and performance tuning?	CO-1	K2
(b)	Explain the role of DML in sql. Assume a table named STUDENT with the following columns: RollNo (Primary Key), Name, City, Marks, and Section and Write the sql statements for the following (2) (i) Insert a new record for a student named 'XYZ' from 'Pune' with 85 marks and RollNo 101. (2) (ii) Find the average Marks of clas.s (2) (iii) Find the Name, City of students with Maximum Marks. (1)	CO-3	K2
(c)	Define the fundamental operations (Selection, Projection, Union, Set Difference, Cartesian Product, and Renaming) in relational algebra. Explain how Division is constructed from these.	CO-3	K3
(d)	Discuss the process of normalization from 1NF, 2NF, 3NF. BCNF. Why is it essential to eliminate data redundancy and update anomalies?	CO-4	K3
(e)	Explain the criteria for a schedule to be Conflict Serializable. How does it differ from View Serializability, and why is testing for conflict serializability more commonly used in practice?	CO-5	K3

SECTION C

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

(a)	Compare the Hierarchical and Network models. Why have these models largely been replaced by the Relational model in modern applications?	CO-1	K3

(b)	Describe the Three-Schema Architecture of a DBMS. How does this architecture help in achieving data abstraction?	CO-1	K2

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

(a)	Differentiate between Simple, Composite, Multi-valued, and Derived attributes with an example for each.	CO-2	K3
(b)	Describe the step-by-step rules for reducing an ER diagram to relational tables. Provide an example of converting a many-to-many relationship.	CO-2	K3

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

(a)	Discuss the concept of Domain Independence and "Safe" expressions in Relational Calculus. Why is it important that a query does not produce an infinite result?	CO-3	K2
(b)	Explain the role of DDL in sql and Write the sql statements for the following (2) (i) Create a table named Employees with columns : EmpID, JoinDate, FullName, and address. (2) (ii) Add new column named Salary to the existing Employees table.(1) (iii) Create a table called Departments where the DeptID is the Primary Key, and then create a foreign key in the Employees table that links to Dept ID. (2) (iv) Insert a new record into the Employees table for "XYZ" with ID11.	CO-3	K2

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

(a)	Explain Functional Dependency and state the difference between a trivial and a non-trivial functional dependency with examples.	CO-4	K3
(b)	Explain the following (i) Multi valued Dependency (MVD) (ii) Join Dependency (JD)	CO-4	K2

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

(a)	Describe the "Growing Phase" and "Shrinking Phase" of 2PL. How does 2PLguarantee serializability and also explain its limitations.	CO-5	K2
(b)	Why is checkpoint essential for log-based recovery? Describe the process the system follows when it encounters a checkpoint during a crash recovery.	CO-5	K3