



BTECH
(SEM V) THEORY EXAMINATION 2023-24
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. 2 x 7 = 14

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| Define join. Explain different types of join. |
| Explain normalization. What is normal form? |
| Discuss the concept of Boyce-Codd Normal Form. |
| Discuss log-based recovery methods. |
| Define deadlock and discuss the various strategies. |
| Explain the concept of isolation levels in concurrency control. |
| Define multiple granularity in concurrency control. |

SECTION B

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

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| Draw overall structure of DBMS and explain its components in brief. |
| Highlight the characteristics and advantages of SQL (Structured Query Language). |
| Define Minimal Cover. Suppose a relation R (A,B,C) has FD set F = {A→B, B→C, A→C, AB→B, AB→C, AC→B} convert this FD set into minimal cover. |
| What do you understand by ACID properties of transaction? Explain in details. |
| Explain two phase locking protocol with suitable example. |

SECTION C

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

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| (a) Explore the extended Entity-Relationship (ER) model, focusing on relationships of higher degree. |
| (b) Differentiate between Data Definitions Language (DDL) and Data Manipulation Language (DML). |

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

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| (a) Discuss the concepts of tables, views, and indexes in SQL. Explain how these database objects are used to organize and optimize data retrieval. |
| (b) Explain the concepts of tuple calculus and domain calculus in relational databases. Discuss how these calculi are used for specifying queries and constraints. |

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

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| (a) Define functional dependencies and explain their significance in the context of a relational database. |
| (b) Explain the concept of lossless join decompositions in the normalization process. |

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

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| (a) Explain the process of recovering from transaction failures in a database system. Discuss the role of logs and mechanisms for identifying and rectifying failures. |
| (b) Differentiate between conflict and view serializable schedules. Explain the criteria and conditions for a schedule to be considered conflict or view serializable. |

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

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| (a) Explain the phantom phenomena. Discuss a time stamp protocol that avoids the phantom phenomena. |
| (b) Explain the validation-based protocol for concurrency control. |