4E1305

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4E1305

B. Tech. IV - Sem. (Main / Back) Exam., - 2025
Artificial Intelligence and Data Science
4AID4-05 Database Management System
CS, IT, AID, CAI, CCS, CDS, CIT

Time: 3 Hours **Maximum Marks: 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1 Why is a DBMS preferred over a traditional file system?

Q.2 What is the difference between a weak entity and a strong entity?

Q.3 Name any two operations of relational algebra with example.

Q.4 What is ODBC? How does it differ from JDBC?

Q.5 Explain the concepts of Primary Key.

Q.6 What is Concurrency?

Q.7 Draw a neat diagram of database system architecture.

Q.8 What is Entity? Explain with example.

Q.9 What is the need of Serializability in transaction processing?

Q.10 Explain role of Triggers in SQL programming.

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1 Explain binary, ternary and weak entity relationship with examples.

Q.2 Define the following with example -

(a) Aggregation in E-R model

(b) Data Integrity

Q.3 What is Boyce-Codd Normal Forms & 3-NF in detail?

Q.4 Describe relationship algebra selection and projection with example.

Q.5 What is shadow paging? Explain in detail.

Q.6 What is transaction? Explain its ACID properties?

Q.7 Compare lock-based and timestamp-based concurrency control.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

Q.1 Explain Entity Relationship model. Draw E-R diagram for university management system with complete labelling.

Q.2 What are functional dependencies? Give a relation R (A, B, C, D) with dependencies {A→B, B→C, C→D}, decompose it into BCNF and explain the process.

Q.3 Explain different types of concurrency control technique. Compare their advantages and disadvantages.

Q.4 Create a table called Employee that contain attributes (EMPNO, ENAME, JOB, MGR, SAL) execute the following -

(1) Add a column commission with domain to the Employee table.

(2) Insert any five records into the table.

(3) Update the column details of job.

(4) Rename the column of Employee table using alter command.

(5) Delete the employee whose Empno. is 105.

Q.5 Explain the recovery schemes in database. Also explain deadlock handling.
