(Please write your Exam Roll No.) Exam Roll No. ....356.....

END TERM EXAMINATION

FIRST SEMESTER [MCA] JANUARY 2024

Paper Code: MCA-107 **Subject: Database Management Systems**

Time: 3 Hours **Maximum Marks: 60**

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit.

Q1 Answer all the following questions briefly:- **(2x10=20)**

(a) State the difference between DBMS and RDBMS.
(b) What are trivial and non-trivial functional dependencies.
(c) What do you mean by minimal cover of a FD set?
(d) What are primary keys and foreign keys in a database table.
(e) Write a short note on two-phase locking protocol.
(f) In concurrency control, how deadlock is handled.
(g) Discuss ACID properties.
(h) State the difference between 3 NF and BCNF.
(i) Does a relation with two or more columns always have an MVD? Show with an example.
(j) Distinguish outer and inner joins.

UNIT-I

Q2 (a) Discuss the concept of generalization and specialization with examples. **(5)**
(b) State the differences between instances and schemas. **(5)**

Q3 (a) Draw and elaborate the architecture of DBMS while providing suitable example. **(5)**
(b) Differentiate between Network & Relational Data Base Management Systems. **(5)**

UNIT-II

Q4 (a) Discuss tuple relational calculus and domain relational calculus. **(5)**
(b) Differentiate between DML, DDL, DCL, and TCL. **(5)**

Q5 (a) Write Syntax and examples of following SQL commands: **(5)**
(i) Alter table with different clauses
(ii) Like operator
(iii) Check constraint
Also discuss the difference between HAVING and WHERE clause.
(b) With a single example, discuss Unions, intersection and minus operators. **(5)**

UNIT-III

Q6 (a) Consider a relation R= {A, B, C, D, E, F, G, H} with the following FDs= {A→ BCD, AE→ F, E→G, D→ H}. Decompose the relation till 3NF. **(5)**
(b) Discuss the structure of PL/SQL Block. What is the use of cursors and triggers. **(5)**

Q7 (a) List the roles of different types of keys in DBMS. And, find candidate keys and Primary Key for R= {A, B, C, D, E} and F= {CD→E, DE→B, AB→C} **(5)**
(b) Given a relation R {P, Q, R, S, T} and Functional Dependency set FD = {QR → PST, S → Q}, determine given R is in which normal form? **(5)**

UNIT-IV

Q8 (a) Differentiate between Conflict and View serializability. **(5)**
(b) Explain lossy and lossless decomposition. **(5)**

Q9 (a) Explain dependency preserving decomposition in detail. Elaborate differences between RDBMS and OODBMS. **(5)**
(b) Discuss the concept of database security. How database administrator ensures the security of the database. **(5)**

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