

MCA/D07
Database Systems
Paper : MCA-301

Time : Three Hours

MM:50

Note:- Attempt Five questions in all, selecting at least One question from each unit.

- 1(a) "Database serves community users" Discuss. 3
 (b) Why is DBMS divided into different layers? 3
 (c) What causes inconsistencies of database? 4
- 2(a) What do you understand by ER model? How does ER model help in analyzing a problem? 4
 (b) Create an ER diagram showing following relationship.
 Indicate what kind of relationships they are in.
- The STUDENTS may be taught by one and only one TEACHER
 The TEACHER may be instructor of one or more STUDENTS.
 - The TEACHER may be responsible for one and only one CLASS.
 The CLASS may be responsibility of one and only one TEACHER.
 - The CLASS may be made up of one or more STUDENTS.
 The STUDENT may be the member of one and only one CLASS. 6
- 3 Differentiate between the following:
 (a) Controlled and Uncontrolled redundancy.
 (b) Conceptual and Logical schema.
 (c) Cardinality and Degree of relation.
 (d) Cartesian and join operation.
 (e) Conceptual and Logical operation. 10
- 4(a) What is Domain? Explain its significance. 2
 (b) Discuss the strength of relational model of database. 4
 (c) 'Navigation is simpler in relational model than in any other data model' Discuss. 4

UNIT –II

- 5(a) What is functional dependency? Why can we not infer functional dependencies from a particular relation state? 4
 (b) State the characteristics of functional dependencies. 2
 (c) Give the relation r(R). State whether or not the following functional dependencies are satisfied by the relation:

$A \bowtie B$
 $A \bowtie C$
 $AB \bowtie C$
 $C \bowtie A$
 $BC \bowtie A$
 $AC \bowtie B$

A	B	C
1	4	2
3	5	6
3	4	6
7	3	8
9	1	0

- 4
- 6(a) How does foreign keys of relation relate candidate keys? Give example to illustrate your answer. 4
- (b) Consider the relationship $r(A, B, C, D, E, F)$ and the set $F = \{A \rightarrow B, C \rightarrow DF, AC \rightarrow E, D \rightarrow F\}$. What is the key of the relation? What is the highest normal form of this relation? 3
- (c) Find the highest normal form of the relation $r(A, B, C, D)$ if the following functional dependencies are satisfied by the relation:
 $F = \{AB \rightarrow D, AC \rightarrow BD, B \rightarrow C\}$ 3
- 7(a) What is a view in SQL? How is defined? What are the problems that may arise when one attempts to update a view? Explain. 4
- (b) What are the important factors that influence the physical database design? Discuss. 4
- (c) What cause anomalies in the database? 2

UNIT – III

- 8 Differentiate between the following:
- (a) Do And Redo operation.
 - (b) Before image and After Image.
 - (c) Serial and Non-Serail schedule.
 - (d) Atomicity property and Isolation property
 - (e) Lost Update and Temporary update problem 10
- 9 (a) What is meant by Database recovery? Discuss the limitations of log files. 5
- (b) Discuss different methods that can be used for the authentication and identification of an user. 5
- 10 Write short notes on the following:
- (a) Timestamping ordering
 - (b) Multiversion techniques 10