Roll No. .....

MCA/D09
Database System
Paper: MCA-301

5475

Time: Three Hours] Maximum Marks: 80

Note:- Question No.**1** is compulsory. Out of the remaining, Candidate is required to attempt any **FOUR** questions by selecting at least **ONE** question from each unit.

1. Differentiate between the following:-
   (a) UNDO and REDO operation
   (b) Immediate Update and Deferred Update
   © Uncontrolled and Controlled redundancy
   (d) Cartesian product and join Operation
   (e) FD, MVD and JD
   (f) Serial Schedule, Non-Serial Schedule, Recoverable Schedule.
   (g) Base relation and View. 16

UNIT-I

2. **(a)** Describe the main characteristics of database approach in contrast with file-oriented approach. 6

(b) In context of relational model explain the following :-
   (i) Relation
   (ii) Degree
   (iii) Tuple
   (iv) Cardinality
   (v) Domain
   10

3(a) Define a foreign key. What is this concept used for? How does it playa role in the JOIN operation? 5

(b) Explain the difference between external, conceptual and internal schemas. How are these different schema layers related to concept of physical and logical data independence? 6

(c) Explain how ER diagrams can be converted into relations. 5

UNIT-II

4(a) Explain with suitable examples the various commands used in querying and manipulating the table through DML. 8

(b) Describe the basic structure of ORACLE RDBMS. 8

5(a) Give comparison between Network and hierarchical Data model. 8

(b) Describe various SQL statements that can be used to specify views, constraints and indexes. 8

UNIT-III

6. Consider the relational scheme of relation Schedule shown below. What is the key of the relation? What is the highest normal form of this relation? What type of anomalies does this relation have? SCHEDULE (Student- ID, Class_No, Student_Name, student- Major, Class_Time, Building_Room, Instructor)

Assume the following dependencies:

Student_ID - Student_Name

Student- ID - Student_Major

Class_No. - Class Time

Class_No. - Building_Room

Class _No.- Instructor 16

7(a) Discuss the role of information systems in organizations 8

(b) Describe the process of designing databases. 8

UNIT-IV

8(a) What do you mean by threat in a database environment? List the potential threats that could affect a database system. 6

(b) How does the recovery manager ensure atomicity and durability to transactions? 5

(c) How is a time-stamp based protocol for concurrency control different from locking based protocols? 5

9(a) What is meant by Database recovery? Discuss the limitations of log files. 6

(b) What is check point? How does check pointing help in recovery? 10