MCA/D08
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) Illustrate redundancy and problems that it can cause. 5
(b) What do youmean by the term 'Controlled Redundancy' Discuss. 5
(c) Explain the term 'integrated' with respect to a database. 5

2 (a) What is data independence and why is it important? It is said that the file systems lack data independence? Discuss. 5
(b) Describe different levels of abstraction at which database may be viewed. 5

3 (a) Why do set theoretic operators require Union Compatibility? 5
(b) How join operator is different from cartesion product? 5
(c) Why tuples in a relation are not ordered? 5

4 A bank offers four types of accounts: Loan, Saving, Daily and Recurring. It operates a number of accounts. Accounts can be joints, i.e. more than one Client may be able to operate a given account. Identify the entity of interest and show their attributes? What relationships exist among these entities? Draw the corresponding E-R diagram. 10

5(a) Why BCNF is required over 3NF? 5
(b) "BCNF" is considered to be more stronger and stricter than 3NF,Discuss 5
(c) Discuss when a relation is in 3Nf but falls to meet the requirements of BCNF. 5

6(a) Given the relationship R(A,B,C,D) and the set F=(AB $\longrightarrow$C, B $\longrightarrow$D, D $\longrightarrow$ B) of functional dependencies:
(i) Find Candidate keys of the relation. How many candidate keys are in the relation? 4
(ii) Which one is primary key? What are prime attributes? 1
(b) Describe basic structure and database structure used in Oracle system. 5

7(a) Discuss the role of data model in database design process. 3
(b) Compare the following data models:
Hierarchical and Network Data Model 7

UNIT –III

8(a) Explain what is meant by a transaction? Discuss, with examples, the types of problems that can occur in a multi user environment when concurrent access to the database is allowed. 6

(b) Explain the concept of serial, nonserial, serializable schedule and recoverable schedules. 4

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

(b) Compare and contrast the deferred update and immediate update recovery protocols? 5

10(a) Describe the different types of security threats to a company's database and ways of protecting the data. 10