MCS – 023

BACHELOR OF COMPUTER APPLICATIONS (ONLINE)

Introduction to database management systems

Time : 3 Hours

Maximum Marks : 100

Note : (i) This paper consists of 3 sections (Section-A,B,C)

(ii) Section – A: Attempt any five questions out of seven questions.

(iii) Section – B : Attempt any five questions out of seven questions

(iii) Section – C : Attempt any two questions out of three questions.

Short Answer (Section – A): Attempt any five questions out of seven questions. Each question carry four marks.

1. What is Database Management Systems? Explain three level architecture of DBMS using suitable diagram.

2. Explain super keys, candidate keys and primary keys with the help of suitable example for each.

3. Differentiate between 2 phase locking and 2 phase commit.

4. Explain distributed Database System (DDBMS). Also, draw the network topology for DDBMS.

5. List and explain different types of failures that a transaction can encounter during its execution.

6. What do you meant by Authorisation? List the different types of Data Manipulation Operations and control operations.

7. Differentiate between 2 tier and 3 tier client server systems with the help of suitable diagram.

Medium Answer (Section – B) : Attempt any five questions out of seven questions. Each question carry ten marks.

8. Explain Data Definition Language (DDL) and Data Manipulation Language of SQL. List and Explain any three (DML) and (DDL) commands.

9. Why do we use normalization in a database. Explain 2NF. Discuss the Insert, Delete, and update anomalies, if the relation is not in 2NF.

10. Draw an ER diagram for "Library Management System" covering all the functionalities. Identify the entities, relationships and cardinality of an ER diagram. Make and state assumptions wherever necessary.

11. What is the need of indexes in DBMS? Compare primary, secondary and clustering indexes. Which of these indexes are dense? Give steps to perform implementation of clustering indexes.

12. What is the use of Lock in DBMS? Explain different types of locks with suitable example. Also, explain two phase Locking and Strict two phase locking with suitable example.

13. How serial schedule is different from serializable schedule? Discuss the problems associated with both schedules. How will you identify that a schedule is serializable or not? Support your answer with suitable example:

14. Write short notes on the following:

A) Deadlock Avoidance

B) Join Operations

C) Data Replication

D) Advantages of distributed DBMS.

E) Boycee codd normal form

Long Answer (Section – C): Attempt any two questions out of three questions. Each question carry fifteen marks.

15. What is functional dependency? Given the schema R (A,B,C,D,E,F,G,H) with following functional dependencies:

CH→G

A →BC

B→CFH

E → A

F →EG

Find all possible candidate keys from given set of functional dependencies.

16. Consider the following 'Schema':

Suppliers (Sid/Sname/Saddress)

Parts (Pid, Pname, color)

Catalog (Sid, Pid, cost)

The key fields are underlined. Write the following queries in SQL and Relational Algebra.

(i) Find the names of suppliers who supply blue part.

(ii) Find the Sids of suppliers who supply every red part.

(iii) Find the Pids of parts that supplied by at least two different suppliers.

17. Design a generalization – specialization hierarchy for a motor-vehicle sales company. the company sells motor-cycle, passenger cars, vans and buses. Justify your placement of attributes at each level of hierarchy. Explain why they (attributes) should not be placed at higher or lower level? Convert the ER diagram so made to 3 NF relational scheme.