B033412(033)

B. Tech. (Fourth Semester) Examination, April-May 2022

(AICTE Scheme)

(Information Technology Branch)

DATABASE MANAGEMENT SYSTEM

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

*Note : Attempt all questions. Part (a) from each question is compulsory and carries 4 marks. Attempt any **two** parts from part (b), (c) and (d) of each question and carries 8 marks.*

Unit-I

1. (a) Define Candidate key and super key?

   (b) Draw details E-R diagram for university.

(c) Write the short notes on any two :

   (i) Specialization

   (ii) Generalization

   (iii) Aggregation

(d) Write down the difference between DBMS and RDBMS and what are the responsibilities of a Database Administrator (DBA) in an organisation.

Unit-II

2. (a) Define in brief DDL, DML and their operations.

    (b) Discuss SELECT, PROJECT and UNION operations with suitable example in detail.

    (c) Define Relational Calculus. Explain tuple relational calculus with examples.

    (d) Write short notes on any **two** :

      (i) Index

      (ii) Cursors

      (iii) Triggers

Unit-III

3. (a) Wha is the need of Normalization?

    (b) Given a relation schema $R(A,B,C,D)$ and set of FD's

$$A \rightarrow BC,\ B \rightarrow C,\ A \rightarrow B,\ AB \rightarrow C,\ AC \rightarrow D$$

Compute an irreducible set of FD's that is equivalent to the set.

    (c) Compare 3NF with BCNF with suitable example.

    (d) Write short notes on :

      (i) MVD

      (ii) PJNF

Unit-IV

4. (a) What is Deadlock?

    (b) Discuss ACID properties of transaction with the help of example.

    (c) Wha are the various stages of query processing? Explain the structure of query optimizer?

(d) What is serializability? Explain the concept of conflict serializability with example.

Unit-V

5. (a) Define time stamp ordering?

(b) What are the different types of concurrency control technique and also expain their comparative analysis?

(c) Compare the deferred update and immediate update techniques for database recovery with example.

(d) Write short notes on :

(i) ISAM

(ii) Shadow paging