

Duration: 3hrs

[Max Marks:80]

- N.B. : (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR

[20]

- a Justify the need of DBMS in Banking and Airlines.
 b List all functional dependencies satisfied by the given relation.

A	B	C
A1	B1	C1
A1	B2	C1
A2	B2	C1
A2	B2	C1

- c Describe UNION, INTERSECTION and DIFFERENCE operations in relational algebra.
 d Draw and explain the Transaction state diagram.
 e List types of database users and their functions.

2 a Design a database for a worldwide package delivery company (e.g., DHL [10]

or FedEx). The database must be able to keep track of customers who ship items and customers who receive items; some customers may do both. Each package must be identifiable and trackable, so the database must be able to store the location of the package and its history of locations. Locations include trucks, planes, airports, and warehouses. Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.

b Explain roles and responsibilities of database administrator.

[10]

- 3 a Consider the following schema. The primary keys are underlined.

Student (Snum, Name, Major, Level, Age)

Class (Name, Time, Room, Fid)

Enrolled (Snum, ClassName)

Faculty (Fid, Name, Dept)

Write SQL queries for the following

- Find the names of all CS Majors (Major = "CS") who are enrolled in the course "Math20" and are older than some History freshman (Level="FR").
- Find the names of all pairs of students who are enrolled in some class together.
- Find the names of faculty members who teach in every room in which some class is taught in the time period "MW12-1".
- Print the Level and the average age of students for that Level, for each Level.
- Find the names of all students who are not enrolled in any class taught by "Srinivasan".

b Draw and Explain three tier database architecture in detail. [10]

4 a Explain DDL and DML commands with suitable examples. [10]

b Explain types of integrity constraints with example. [10]

5 a What are three data anomalies? Explain how it can be overcome by using normalization. [10]

b Consider data item A and B. Find whether the following schedule is conflict serializable or not. [10]

Schedule U: r2(A),w2(A),r1(A),w1(A),r2(B),w2(B).

6 a Explain properties of transactions in detail. Give appropriate example for each property. [10]

b Consider the following dependency diagram of relation R and Normalize till 3NF [10]

