

Con. 2781-07.

[REVISED COURSE]

ND-578

25th May 2007

(3 Hours)

[Total Marks : 100]

- N.B.** (1) Question No.1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) **Figures** to the **right** indicate marks.
 (4) Assume any **suitable** data wherever **required** but **justify** the same.

1. Define the following terms :- 20
 - (a) Primary, candidate, super and foreign keys
 - (b) Total participation and partial participation
 - (c) Any four Relational Algebra operators
 - (d) Triggers and stored procedure.

2. (a) Construct an E-R diagram for a car-insurance company that has a set of customers, each of whom owns one or more cars. Each car has associated with it zero to any number of recorded accidents. 8
 (b) We can convert any weak entity set to a strong entity set by simply adding appropriate attributes. Why, then, do we have weak entity sets? 12

3. (a) List the ACID properties. Explain usefulness of each. 8
 (b) What is the importance of recovery? Compare the deferred – and immediate modification versions of the log-based recovery schemes in terms of ease of implementation and overhead cost. 12

4. (a) Draw the typical database system architecture and explain it in detail. 8
 (b) Explain the purpose of the checkpoint mechanism. How often should checkpoints be performed? How does the frequency of checkpoints affect – 12
 - (i) System performance when no failure occurs
 - (ii) The time it takes to recover from a system crash
 - (iii) The time it takes to recover from a risk crash.

5. (a) How does the concept of an object in the object-oriented model differ from the concept of an entity in the entity–relationship model? 8
 (b) List the three design goals of relational databases and explain why each is desirable. 12

6. (a) Consider the following relational database : 8

employee (person_name, street, city)
 works (person_name, company_name, salary)
 company (company_name, city)
 manages (person_name, manager_name)

Give an SQL DDL definition of this database. Identify referential–integrity constraints that should hold and include them in the DDL definition.
- (b) Explain BCNF, 3NF and 4NF with suitable example. 12

7. Write down short note on :- 20
 - (a) Join in tables
 - (b) Group by and order by clause in SQL
 - (c) Comparison of RDBMS, OODBMS, ORDBMS
 - (d) Database Administrator.