

Duration: 3hrs

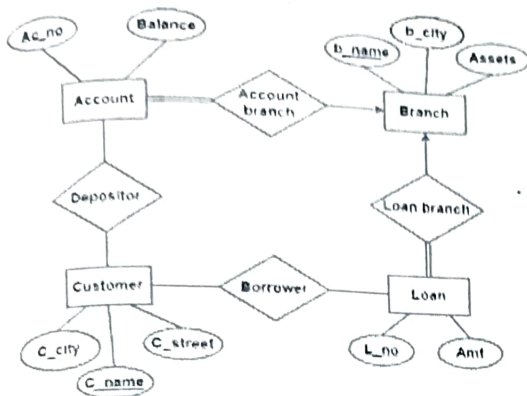
[Max Marks:80]

- 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.

Attempt any FOUR

[20]

- 1 a Identify different users of database management system
 b Convert following E-R diagram to relational schema



- c Explain all types of integrity constraints with an examples?
 d List all functional dependencies satisfied by the relation.

X	Y	Z
X1	Y1	Z1
X1	Y2	Z1
X2	Y2	Z1
X2	Y2	Z1

- e Discuss Log based recovery with an example

- 2 a Discuss three layer schema architecture with suitable diagram. What is Data Independence? Explain types of data independence.

[10]

- b What is deadlock? Give deadlock prevention methods with suitable example

[10]

- 3 a Construct an ER diagram and convert it into a relational model for a company which has several employees working on different types of Projects. Several employees are working for one department, every department has a manager. Several employees are supervised by one employee. Employees have zero or more dependents

[10]

- b Explain the following Relational Algebra operations with suitable example.
- 1) Generalized Project 2) Select
 - 3) Union 4) Rename
 - 5) Natural Join

[10]

- 4 a Write SQL queries for the given database
- Book(book_id, title, author, cost)
- Store(store_no, city, state, inventory_val)
- Stock(store_no, book_id, quantity)

[10]

- (i) Modify the cost of DBMS books by 10%
- (ii) Find the total number of books in Mumbai stores
- (iii) Find title of all books whose title contains the word 'System'
- (iv) Find title of the most expensive book
- (v) Add a new record in Book (Assume values as per requirement)

- b Why there is need of normalization? Explain 1NF, 2NF, 3NF and BCNF with example.

[10]

- 5 a Describe ACID properties with examples

[10]

- b Give example of serial schedule and equivalent to serial schedule with respect to conflict serializability. Discuss conflict serializability with example

[10]

6 Write short note on the following (Any four)

[20]

- a Conversion of Specialization to relational schema with suitable example

[05]

- b Types of attributes

[05]

- c 2PL concurrency control protocol

[05]

- d Triggers

[05]

- e Lossless decomposition

[05]