05-2023

Paper / Subject Code: 40523 / Database Management System

S E Sem IV (C Scheme, R 2019) Computer May 2023

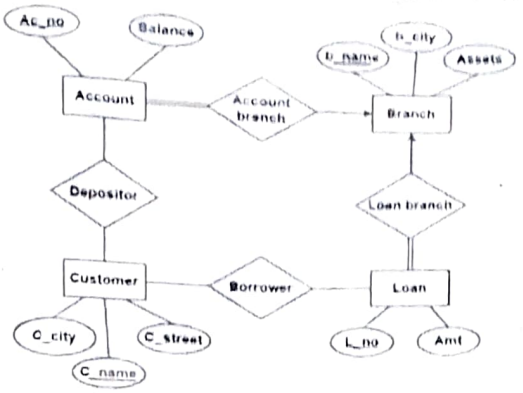
Duration: 3hrs **[Max Marks:80]**

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 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. [10]

1) Generalized Project 2) Select

3) Union 4) Rename

5) Natural Join

4 a Write SQL queries for the given database [10]

Book(book_id, title,author, cost)

Store(store_no, city, state, inventory_val)

Stock(store_no, book_id,quantity)

(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 serailizability. 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]
