Extra

S. E. Sem IV / R-19 / FH23 / 15/05/2023
(COMP)

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

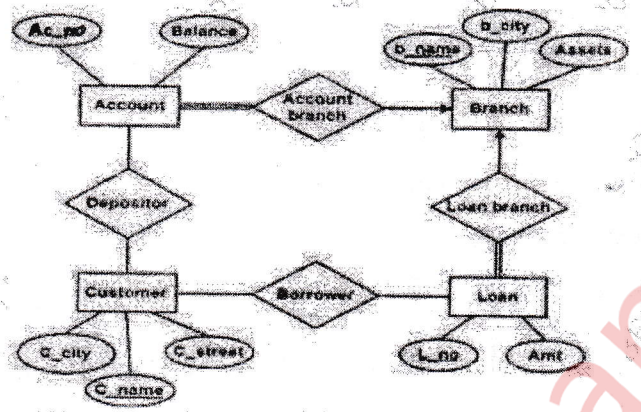
QP : 29883

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]

[Time: 3 Hours] **[Marks: 80]**

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1 **Attempt any FOUR** **[20]**

a Compare File Processing System with Database Management system **05**

b **05**

T1	T2
read(A) A := A − 50	
	read(A) temp := A ∗ 0.1 A := A − temp write(A) read(B)
write(A) read(B) B := B + 50 write(B) commit	
	B := B + temp write(B) commit

Draw the precedence graph for above schedule?

c Define with an example different type of Entities in ER diagram **05**

d Define Triggers. Write syntax and example of trigger. **05**

e Explain five aggregate functions of SQL with example? **05**

2 a Design an EER diagram for Hospital Management System. And map it into relational model. Assume Suitable data. **[10]**

b Brief overall database architecture with suitable diagram. **[10]**

3 a Consider the following employee database. **[10]**

Employee (empname, street, city, date_of_joining)
Works (empname, company_name,salary)
Company (company_name, city)
Manages (empname, manager_name)

Write the SQL queries for each of the statements given below

a) Modify the database so that 'John' now lives in 'Mumbai'.
b) Find all employees who joined in the month of October.
c) Give all employees of 'ABC Corporation' a 10% raise.
d) Find all employees in the database who live in the same cities as the companies for which they work
e) Find all employees who earn more than average salary of all employees of their company

b Explain following relational algebra operators with example **[10]**
a) Selection operator b) Union operator
c) Rename operator d) Cartesian product

4 a Explain concurrency control and explain time Stamp based protocol of concurrency control. **[10]**

b Why there is need of normalization? Explain 1NF,2NF,3NF and BCNF with examples. **[10]**

5 a Describe ACID properties with examples and explain state transition diagram of transaction. **[10]**

b What is Deadlock. Explain wait-die and wound-wait methods with suitable example. **[10]**

6 **Attempt any two**

a Explain in detail with example of conflict and view serializability . **[10]**

b Explain following Integrity constraints: **[10]**
a) Key Constraints.
b) Domain Constraints (Null & Default Constraints).
c) Referential Constraints.
d) Check Constraints.

c Write short note on Log based recovery mechanism **[10]**
