9. What is deadlock ? Explain various deadlock handling methods in detail. [ 14 ]

10. Discuss the concept of two phase locking protocol. Also Explain various concurrency Control techniques in detail. [ 14 ]

-----x -----



# Question Paper Code : 8375

**B.Tech. (Semester-V) Examination, 2021**

## DATABASE MANAGEMENT CONCEPTS

**[ Paper : CS-502 ]**

**Time : Three Hours]** **[Maximum Marks : 70**

**Note :** Answer **any five** questions. All questions carry equal marks.

1. (a) Compare and Contrast the differences between file Processing System and DBMS. Also discuss the term generalization and Specialization with suitable example. [ 7 ]

(b) What is data Model? Explain types of data model used. [ 7 ]

2. (a) Distinguish the term : Super Key, Candidate Key, Primary Key, and Foreign Key with suitable example. [ 7 ]

(b) What are the Symbols used in E-R diagram? Construct an E-R diagram for Library Management System. [ 7 ]

3. (a) Explain the Concept of Natural Join. Also discuss the types of Outer Join with suitable example. [ 7 ]

(b) Discuss the Concept of trigger with suitable example. [ 7 ]

4. Consider the following Schema : [ 14 ]

Supplier ( Sid, Sname, City )

Parts ( Pid, Pname, Color )

Orders ( Sid, Pid, quantity )

(i) Find name of Suppliers who belongs to city 'Lucknow'.

(ii) Find the name of suppliers who supply red color parts.

(iii) Find the name of city from where more than five supplier belonge.

(iv) Find name of supplier who supply all parts.



(v) Find name of parts supplied in quantity more than 5000.

(vi) Find Sid of supplier who supply no parts.

(vii) Find name of supplier who supply red or green color parts.

5. (a) Explain the concept of MVD in context of RDBMS with suitable example. [ 7 ]

(b) Explain entity integrity, referential integrity and domain constraints. [ 7 ]

6. What is the purpose of Normaliztion? Explain 2NF, 3NF, BCNF and 4NF in detail with suitable example. [ 14 ]

7. What do you mean by schedule? Explain the method to check conflict and view serializability with suitable example. [ 14 ]

8. What do you mean by Transaction? Explain transaction property in detail. Also Explain concept of log based recovery. [ 14 ]

7. Consider the following schema for institute library :

Student (Roll No., Name, F_name, Branch)

Book (ISBN, Title, Author, Publisher)

Issue (Roll No., ISBN, Date-of-issue)

Write the following queries in SQL and Relational algebra :

(i) List Roll number and name of all student of branch 'CSE'.

(ii) Find name of student who have issued book published by 'ABC' publisher.

(iii) List all books published by publisher 'ABC'.

(iv) List title of all books issued on or before 1 Jan., 2021.

8. Describe MVD. Explain fourth and BCNF with suitable example.

9. What is conflict serializable schedule ? For the schedule given below check conflict serializability :

$S = R_1(X), R_3(X), W_1(X), R_2(X), W_3(X)$

10. Explain time stamp based and validation based protocols for concurrency control in detail.



# 8375

## B.Tech. (Reg./Back) Vth Semester Examination, 2022–23

## DATABASE MANAGEMENT CONCEPTS

**Paper : CS–502**

*Time : 3 Hours* ] [ *M.M. : 70*

*Note* :– Answer any *five* questions. All questions carry equal marks.

1. (a) Explain external schema, conceptual schema and internal schema.

(b) What is Entity ? Explain the various types of attributes with suitable example.

(c) Explain the concept of specialisation and generalisation with respect to database. Also discuss the concept of aggregation. 5,5,4

2. (a) Explain trigger with suitable example.

(b) What is Join ? Explain the various joins with suitable example.

(c) Explain Entity Integrity and Referential Integrity Constraints with example. 5,5,4

3. (a) Explain 2NF and 3NF with suitable example.

(b) What do you mean by lossless decomposition ? Explain with suitable example how function dependencies can be used to show that decomposition are lossless.

(c) Consider the relation :

R = (A, B, C, D, E, F, G, H, I, J)

and the set of functional dependency F as given below :

$F = \{AB \rightarrow C, A \rightarrow DE, B \rightarrow F, F \rightarrow GH, D \rightarrow IJ\}$

Determine the key for R. Also decompose R into second normal form. 5,5,4



4. (a) What is Transaction ? Draw a state diagram of a transaction showing its states. Explain ACID properties of a transaction with suitable example.

(b) Describe the serializability. Explain view serializability in detail.

(c) What are the various techniques of recovery from transaction failure ? Explain log based recovery. 5,5,4

5. (a) Explain two phase commit protocol. How is it performed show with example ?

(b) What is the difference between shared lock and exclusive lock ? Explain with example.

(c) Explain the various deadlock handling approaches. 5,5,4

6. Define Super Key, Candidate Key, Primary Key and Foreign Key with suitable example. Also, define the term data model.

FACULTY OF ENGINEERING, UNIVERSITY OF LUCKNOW

Mid-Term Test - II

B.TECH. SEMESTER - V, 2022-23

Branch: ~~EE~~ CSE

Student's Roll No.....

**Subject Code: CS- 502** **Subject Title: Database Management Concepts**

**Time: 1 Hrs.** **Full Marks: 20**

**Note:** Attempt questions from each section as per instructions. The symbols have their usual meaning.

## SECTION A

**1. *Attempt all parts of this question. Each part carries 1 mark.*** **(1 x5=5)**

a) Define Trigger and its Syntax.
b) What do you mean by lossless Join Decomposition?
c) Discuss Rollback and Checkpoint.
d) Define Schedule.
e) Write Armstrong Axiom.

## SECTION B

***Attempt any THREE questions of the following. Each question carries 5 marks.*** **(5 x 3=15)**

2. Write relational Algebra Queries for following Relation:
   (a) Supplier (SID, Sname, City)
   (b) Parts (PID, Pname, Color)
   (c) Orders (SID, PID, Quantity)
   (i)Find the name of supplier who supply red color part in quantity more than 1000.
   (ii) Find the name of Supplier who supply all parts.
   (iii) Find the name of Supplier who belongs to the city Lucknow.
   (iv) Find details of parts Supplied by supplier "S1"
   (v) Find SID of Supplier who do not supply any Parts.
3. Explain 2nd and 3rd Normal Form in detail.
4. Explain Conflict Serializability with suitable Example.
5. Explain ACID property in details also explain transaction state diagram.



FACULTY OF ENGINEERING & TECHNOLOGY

UNIVERSITY OF LUCKNOW

Mid-Term Examination - 1

B.Tech. SEMESTER – V, 2022-23

Student's Name & Roll No. .....

**Subject Code: CS-502** **Subject: Database Management Concepts**

**Time: 1 Hrs.** **Max. Marks: 20**

**Instruction: Attempt all sections** **Branch: CSE**

## SECTION A

**1) Attempt all parts** **(1X5 = 5)**

**a)** What are advantages of DBMS?
**b)** Define database schema and instance.
**c)** What is attribute? List various types of attributes.
**d)** Define conceptual level schema in DBMS.
**e)** What is generalization?

Fail PL1

## SECTION B

***Answer any THREE questions.*** **(5X3 = 15)**

**2)** What is key? Explain all types of keys with example.
**3)** Explain join and its types with example.
**4)** Differentiate between weak and strong entity. Draw an ER diagram for hospital management system.
**5)** Write SQL queries for following schema:
Supplier(sid, sname, city)
Parts(pid, pname, color)
Orders(sid, pid, quantity)
   a. Write SQL statement to create above tables.
   b. Write SQL statement to insert at least one row in each table.
   c. Write query to update city of supplier S1 from Lucknow to Kanpur.
   d. Find city wise count of suppliers.
   e. Find name of supplier who have ordered red color part in quantity more than 5000.