

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2021****Subject Code:3130703****Date:11/09/2021****Subject Name:Database Management Systems****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		<b>Marks</b>
<b>Q.1</b>	(a) What is Data Definition Language? List DDL statements and explain anyone with an example.	<b>03</b>
	(b) List and describe ACID property of transactions.	<b>04</b>
	(c) Consider the relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies $F = \{A, B \rightarrow C, A \rightarrow \{D, E\}, B \rightarrow F, F \rightarrow \{G, H\}, D \rightarrow \{I, J\}\}$ What is the key for R? Decompose R into 2NF, then 3NF relations.	<b>07</b>
<b>Q.2</b>	(a) Differentiate shared lock and exclusive lock in lock-based protocol.	<b>03</b>
	(b) Describe the Cartesian Product operation in relational algebra.	<b>04</b>
	(c) Draw E-R diagram for student management system with the necessary assumption.	<b>07</b>
<b>OR</b>		
	(c) Consider the relational database given below. Give an expression in the relational algebra to express each of the following queries: Employee (person-name, street, city), Works (person-name, company-name, salary), Company (company-name, city), Manages (person-name, manager-name) (1) Find name of all employees. (2) Find city of employee whose name is 'jashu'. (3) Find name and city of all employees who are having salary > 50000. (4) Find total salary of all employees who are working for company 'HCL'.	<b>07</b>
<b>Q.3</b>	(a) Describe various state of transaction.	<b>03</b>
	(b) List and explain mapping cardinalities of E-R diagram with example.	<b>04</b>
	(c) What is the use of two-phase locking protocol in concurrency control? Describe the two-phase locking protocol in detail.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) What is dirty write in the transaction? Explain with example.	<b>03</b>
	(b) What are the importance of Primary key and Unique key in database? Explain with example.	<b>04</b>
	(c) What is a deadlock in transaction? How to detect deadlock in system? Explain with example.	<b>07</b>
<b>Q.4</b>	(a) Differentiate closed hashing and open hashing in DBMS.	<b>03</b>

- (b) What is the role of an index in the database management system? Explain dense index with example. **04**
- (c) What is the schedule in truncation? How to identify that the given schedule is conflict serializable? Explain with example. **07**
- OR**
- Q.4** (a) What is log-based recovery? List and explain various fields use in log records for log-based recovery. **03**
- (b) Discuss view serializability in transactions. **04**
- (c) Explain various steps involved in query processing with example. **07**
- Q.5** (a) Explain SQL injection in brief. **03**
- (b) What is the use of a cursor in PL/SQL? Explain with example. **04**
- (c) Consider the following relations and write SQL queries for given statements. Assume suitable constraints. **07**
- job(job-id, job-title, minimum-salary, maximum-salary)  
 employee(emp-no, emp-name, emp-salary, dept-no)  
 deposit(acc-no, cust-name, branch-name, amount, account-date)  
 borrow(loan-no, cust-name, branch-name, amount)  
 department (dept-no, dept-name)
- (1) Give name of employees whose employee number is '001'  
 (2) Give name of depositors whose branch name starts from 'S'.  
 (3) Give employee name(s) whose salary is between Rs. 20000 to 30000 and department name is Finance.  
 (4) Update the salary of employee by 10% of their salary who is working in the Finance department.
- OR**
- Q.5** (a) Describe two rules of mandatory access control. **03**
- (b) Describe Grant and Revoke commands with suitable example. **04**
- (c) Write a PL/SQL program that fetches records of all students and insert record as students having CPI > 4 in ELIGIBLE table and students having CPI <= 4 in NOT\_ELIGIBLE table from student\_master table. **07**