



**MARWADI UNIVERSITY**

**Faculty of Technology**

**Information Technology/Computer Engineering**

**B.TECH**

**SEM: 3**

**Enroll. No. \_\_\_\_\_**

**SUMMER: 2022**

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**Subject: - Database Management System (01CE0302)**

**Date:- 26/04/2022**

**Total Marks:-100**

**Time: - 03:00 hours**

**Instructions:**

1. All Questions are Compulsory.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**Question: 1.**

(a) Objective MCQ

[10]

- 1) What is the full form of DBMS?  
(A) Data of Binary Management System  
(B) Database Management System  
(C) Database Management Service  
(D) Data Backup Management System
- 2) Pi ( $\pi$ ) is the symbol of \_\_\_\_\_  
(A) Selection operator  
(B) Projection operator  
(C) Aggregation operators  
(D) Division operator
- 3) Which of the following is not a property of transactions?  
(A) Atomicity  
(B) Concurrency  
(C) Isolation  
(D) Durability
- 4) Relational Algebra does not have  
(A) Selection operator  
(B) Projection operator  
(C) Aggregation operators  
(D) Division operator
- 5) Checkpoints are a part of  
(A) Recovery measures  
(B) Security measures  
(C) Concurrency measures  
(D) Authorization measures
- 6) Which command is used to remove a relation from an SQL?  
(A) Drop table  
(B) Delete  
(C) Purge  
(D) Remove

- 7) Precedence graphs help to find a
  - (A) Serializable schedule
  - (B) Recoverable schedule
  - (C) Deadlock free schedule
  - (D) Cascadeless schedule
- 8) The clause in SQL that specifies that the query result should be sorted in ascending or descending order based on the values of one or more columns is
  - (A) Order by
  - (B) Group by
  - (C) Having
  - (D) View
- 9) In an E-R diagram double lines indicate
  - (A) Total participation
  - (B) Multiple participation
  - (C) Cardinality N
  - (D) None of the above
- 10) A transaction is in \_\_\_\_\_ state after the final statement has been executed.
  - (A) partially committed
  - (B) active
  - (C) committed
  - (D) none of the above

(b) Short Que. (answer in one sentence)

[10]

- 1) What is an Entity?
- 2) Full form of DDL.
- 3) SQL stands for \_\_\_\_\_
- 4) Draw symbols for following in E-R diagram: Weak Entity set, Derived attribute.
- 5) State True or False: Joins can be used to retrieve data from multiple tables.
- 6) List DCL commands.
- 7) Write a symbol for selection operation in relational algebra.
- 8) Define DBMS.
- 9) State true or false: Any relation schema that satisfies BCNF also satisfies 3NF.
- 10) New column can be added to the existing table using \_\_\_\_\_ SQL command.

**Question: 2.**

(a) Draw and explain three level architecture (Abstraction) of DBMS. [08]

(b) List all the Relational algebra operators. Explain the working of Cartesian product Operation and the Difference Operation with an appropriate example. [08]

**OR**

(b) Explain following terms. [08]

- |                 |                         |
|-----------------|-------------------------|
| (1) Primary Key | (2) NOT NULL Constraint |
| (3) Foreign Key | (4) Check Constraint    |

**Question: 3.**

- (a) Draw an E-R diagram for Hospital Management System. Assume relevant entities and attributes for the given system. [08]
- (b) Given relation R with attributes A,B, C,D,E,F and set of FDs as **A--> BC, E--> CF, B-->E and CD--> EF.** [04]
  - 1) Find out closure {A,B} + of the set of attributes.
  - 2) Find out closure {A}+ of the set of attributes.
- (c) Discuss any four aggregate functions with example. [04]

**OR**

- (a) Define Normalization and Explain 1NF,2NF and 3NF in detail. [08]
- (b) Illustrate mapping cardinality in E-R Diagram. [04]
- (c) Explain the working of Select Operation and Project Operation with an appropriate example [04]

**Question: 4.**

- (a) Write a note on conflict serializability. [08]
- (b) List and discuss ACID properties of transaction. [08]

**OR**

- (a) State the differences between PL/SQL and SQL. Write structure of PL/SQL. [08]
- (b) Draw and Explain transaction states diagram. [08]

**Question: 5.**

- (a) Explain two phase locking protocol in detail. [06]
- (b) We have following relations [06]
  - EMP (emp\_no, ename, jobtitle, manager\_no, hiredate, sal, comm, deptno)
  - DEPT (deptno, dname, loc)

Answer the following queries in SQL.

- 1) Find the Employees working in the department 10, 20, 30 only.
  - 2) Find Employees whose names start with letter A or letter a.
  - 3) Find Employees along with their department name.
  - 4) Find the Employees who are working in Smith's department
  - 5) Drop table EMP.
  - 6) Add one column name date in DEPT.
- (c) Explore Log based recovery. [04]

**OR**

- (a) Explore view serializability. [06]
- (b) We have following relations [06]
  - Account ( acc\_no, name, city, balance, loan\_taken)
  - Loan ( loan\_no, acc\_no, loan\_amt, intrest\_rate, loan\_date, remaining\_loan)
- 1) Display the sum of balance of account holders who's live in same city 'Mehsana' using group by clause.
- 2) Display the information about account where balance is less than total balance of all account holders.

- 3) Displays the information of account holders whose loan amount and balance both are same.
  - 4) Display the name of city, remaining loan amount, account, date of loan and loan number of account holders.
  - 5) Delete city column from Account.
  - 6) Display schema of Loan.
- (c) Write query for the following: [04]
- (1) To create a table.
  - (2) To insert values in table.
  - (3) To change name of table.
  - (4) To drop the table.

**Question: 6.**

- (a) Discuss generalization and specialization in E-R diagram with suitable diagram. [08]
- (b) Write a note on 2 phase commit protocol. [04]
- (c) Briefly explain applications of DBMS. [04]

**OR**

- (a) Write short note on database triggers in PL/SQL. [08]
- (b) Explain different types of Outer join. [04]
- (c) Write Relational algebra for below: [04]
  - branch (branch\_name, branch\_city, assets)
  - customer (customer\_name, customer\_street, customer\_city)
  - account (account\_number, branch\_name, balance)
  - loan (loan\_number, branch\_name, amount)
  - depositor (customer\_name, account\_number)
  - borrower (customer\_name, loan\_number)
  - 1) Find all loans of over \$1200
  - 2) Find the loan number for each loan of an amount greater than \$1200
  - 3) Find the names of all customers who have a loan, an account, or both, from the bank
  - 4) Find the names of all customers who have a loan at the Rajkot branch.

**---Best of Luck---**

### Your Que. Paper weight-age as per Bloom's Taxonomy

No.	Que. Level	% of weight-age	
		% of weight -age	Que. No.
1	Remember/Knowledge	20.930233	Q1(a),Q1(b),Q3(or a), Q6( c ),Q6(or b)
2	Understand	26.744186	Q2(a),Q2(b), Q3(c ), Q4(b), Q4(or b), Q5(a),Q6(b)
3	Apply	29.069767	Q3(a),Q3(or b),Q4(a), Q5(c ), Q5(or a),Q5(or c),, Q6(a),Q6(or a)
4	Analyze	11.627907	Q2(or b),Q3(or c)Q4(or a)
5	Evaluate	11.627907	Q3(b),Q5(b),Q5(or b),Q6(or c)
6	Creative	0	

### GRAPH:

