Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

B.Tech. Winter 2022 - 23 Examination

Semester: 3 **Date: 03/10/2022**
Subject Code: 203105260 **Time: 02:00 pm to 04:30 pm**
Subject Name: Database Management System **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (Fill in the blanks, one word answer, MCQ-not more than Five in case of MCQ) (All are compulsory) (Each of one mark) **(15)**

1. Consider the following four schedules due to three transactions (indicated by the subscript) using read and write on a data item x, denoted by r(x) and w(x) respectively. Which one of them is conflict serializable.

(A) $r_1(x)$; $r_2(x)$; $w_1(x)$; $r_3(x)$; $w_2(x)$

(B) $r_2(x)$; $r_1(x)$; $w_2(x)$; $r_3(x)$; $w_1(x)$

(C) $r_3(x)$; $r_2(x)$; $r_1(x)$; $w_2(x)$; $w_1(x)$

(D) $r_2(x)$; $w_2(x)$; $r_3(x)$; $r_1(x)$; $w_1(x)$

2. A transaction completes its execution is said to be

(A) Saved (B) Rolled (C) Committed (D) Loaded

3. In the following Query, which of the following can be placed in the Query's blank portion to display the salary from highest to lowest amount, and sorting the employs name alphabetically? SELECT * FROM instructor ORDER BY salary ____, name ___;

(A) Ascending, Descending (B) Asc, Desc

(C) Desc, Asc (D) All of the above

4 Which of the following is not an example of DBMS?

(A) MySQL (B) Microsoft Acess (C) IBM DB2 (D) Google

5 Which forms have a relation that contains information about a single entity?
(A) 4NF (B) 2NF (C) 5NF (D) 3NF

6 σ and π are _____ type of operations in relational algebra

7 Relation R1 has 10 tuples and 5 attributes. Relation R2 has 0 tuples and 7 attributes. When a CROSS JOIN is achieved between R1 and R2, the resultant set have ____ tuples and ____ attributes

8 Performing the Writing operation (updation), without reading operation is known as _____

9 _____ is a column or group of columns in a table that uniquely identify every row in that table

10 The ability to query data, as well as insert, delete, and alter tuples, is offered by ____ _____

11 Define weak and derived attributes

12 Define Canonical cover

13 Define (i) Entity (ii) Attribute

14 Which clause is used with an “aggregate functions”?

15 Define Distributed Data Base

Q.2 Answer the following questions. (Attempt any three) **(15)**

A) Explain Clustered Indexes?

B) Define Materialization and pipelining for evaluation of expression during query optimization

C) What is normalization and why it is required?

D) Compare and contrast BCNF with 3NF?

Q.3 A) R (A, B, C, D) be a relational schema with the following functional dependencies : **(07)**
F= {A → B, B → C, C → D , D → B}

The decomposition of R into (A, B), (B, C), (B, D)

This decomposition is lossless and dependency preserving or not? Justify your answer.

B) Define DAC,MAC and RBAC **(08)**

OR

B) Discuss concurrency control mechanism with help of example. Discuss any two protocols used for concurrency control? **(08)**

Q.4 A)) Consider a schema R (A, B, C, D, E, F, G, H) and functional dependencies CH → G, A → BC, **(07)**
B → CFH, E → A, F → EG.

Find all possible candidate keys, prime attributes, non-prime attributes and highest normal form of given relation is.

OR

A) Suppose you are given the following requirements for a simple database for the National Football League (NFL): **(07)**

- The NFL has many teams,
- Each team has a name, a city, a coach, a captain, and a set of players,
- Each player belongs to only one team,
- Each player has a name, a position, a skill level
- A team captain is also a player,
- A game is played between two teams and has a date and a score

Construct a ER diagram for the NFL database.

B) Write a SQL query for following questions **(08)**

1. Select the detail of the employee whose name start with P from table employee.
2. Select the detail of employee whose emailId is in gmail
3. Select the details of the employee who work either for department E-104 or E-102.
4. select the name of the employee whose name's 3rd charactor is 'h'.