Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III(NEW) EXAMINATION – WINTER 2022

Subject Code:3130703 Date:24-02-2023

Subject Name:Database Management Systems

Time:02:30 PM TO 05:00 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.**

			MARKS
Q.1	**(a)**	Define following terms. i) Data Abstraction ii) Instance iii) Logical Data independence	**03**
	(b)	List the type of database users. Explain their characteristics in brief, how they interact with DBMS?	**04**
	(c)	State the advantages of Database management systems over file processing system.	**07**
Q.2	**(a)**	Differentiate generalization and specialization.	**03**
	(b)	What are the types of attributes used in ER diagram?	**04**
	(c)	Draw an E-R diagram of following scenario. Make necessary assumptions and clearly note down the assumptions. We would like to make college's semester fee collection system fully computerized. Fees may include your term fees , library fees, gymkhana fees etc..	**07**
		OR	
	(c)	Explain the concept of total participation, partial participation ,strong entity set and weak entity set using ER diagram.	**07**
Q.3	**(a)**	Define the terms. i) Primary Key ii) Unique Key iii) Foreign Key	**03**
	(b)	Explain transitive and trivial functional dependencies.	**04**
	(c)	Suppose a relational schema R (A B C D E) and set of functional dependencies F: { A → B B → E C → D } Check out that relation is in 3NF or not? If not decompose it in 3NF	**07**
		OR	
Q.3	**(a)**	What is the significance of normalization?	**03**
	(b)	Explain Armstrong's axioms.	**04**
	(c)	Suppose a relational schema R (A B C D E F G H I) and set of functional dependencies	**07**

F: {AB → C,
AD → GH,
BD → EF,
A → I,
H → J }

Check out that relation is in 3NF or not? If not decompose it in 3NF.

Q.4 **(a)** List the type of storages in DBMS. Explain in brief: indexed based accessing. **03**

(b) Explain authorization and authentication with respect to database security. **04**

(c) Which type of queries would be solved by Division operator? Explain with examples. **07**

OR

Q.4 **(a)** Write short note on : Hashing technique. **03**

(b) Explain ACID properties of transaction. **04**

(c) With neat diagram steps involved in query processing. **07**

Q.5 **(a)** Explain the concept of deadlock in brief. **03**

(b) Explain GRANT and REVOKE commands with suitable example. **04**

(c) Write a PL/SQL function which takes 3 integer numbers as a parameters and return an average of same. **07**

OR

Q.5 **(a)** Differentiate between Conflict and View Serializability with respect to transaction(any three differences) . **03**

(b) Enlist types of joins. Explain each with SQL syntax. **04**

(c) TABLE Worker(WORKER_ID INT NOT NULL PRIMARY KEY,FIRST_NAME CHAR(25), LAST_NAME CHAR(25),SALARY INT(15),JOINING_DATE DATETIME,DEPARTMENT CHAR(25)); **07**

TABLE Bonus(WORKER_REF_ID INT,BONUS_AMOUNT INT(10),BONUS_DATE DATETIME,FOREIGN KEY (WORKER_REF_ID),REFERENCES Worker(WORKER_ID));

TABLE Title(WORKER_REF_ID INT,WORKER_TITLE CHAR(25),AFFECTED_FROM DATETIME,FOREIGN KEY (WORKER_REF_ID)REFERENCES Worker(WORKER_ID));

Consider above 3 tables ,assume appropriate data and solve following SQL queries

1. Write an SQL query to fetch “FIRST_NAME” from Worker table using the alias name as <WORKER_NAME>
2. Write an SQL query to fetch “FIRST_NAME” from Worker table in uppercase.
3. Write an SQL query to print all Worker details from the Worker table order by FIRST_NAME Ascending.
4. Write an SQL query to print details of the Workers whose FIRST_NAME ends with ‘h’ and contains six alphabets.
5. Write an SQL query to print details of the Workers who are also Managers.
6. Write an SQL query to fetch departments along with the total salaries paid for each of them.
7. Write an SQL query to fetch the names of workers who earn the highest salary.

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