Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–III (NEW) EXAMINATION – WINTER 2020

Subject Code:3130703 Date:04/03/2021

Subject Name:Database Management Systems

Time:10:30 AM TO 12:30 PM Total Marks:56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	Define following terms. 1) Schema 2) Database Management System 3) Physical Data Independence	**03**
	(b)	Describe tasks performed by the Database Administrator.	**04**
	(c)	Differentiate strong entity set and weak entity set. Demonstrate the concept of both using real-time example using E-R diagram.	**07**
Q.2	**(a)**	Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, M} and the set of functional dependencies {{E, F} -> {G}, {F} -> {I, J}, {E, H} -> {K, L}, K -> {M}, L -> {N} on R. What is the key for R?	**03**
	(b)	Consider a relation scheme R = (A, B, C, D, E, H) on which the following functional dependencies hold: {A–>B, BC–> D, E–>C, D–>A}. What are the candidate keys of R?(Any 1 in case of more than one candidate key	**04**
	(c)	Draw an E-R diagram of following scenario. Make necessary assumptions and clearly note down the same. We would like to make our College's manually operated Library to fully computerized .	**07**
Q.3	**(a)**	Define the terms: a) Primary Key b) Super Key	**03**
	(b)	List the type of joins in relational algebra. Explain with example.	**04**
	(c)	Which operator is used for "For All "type of queries? Explain same with example.	**07**
Q.4	**(a)**	Define the terms : a) foreign key b) candidate key	**03**
	(b)	List unary relational operators and explain with example.	**04**
	(c)	Consider the following relational database schema consisting of the four relation schemas: **passenger** (pid, pname, pgender, pcity) **agency** (aid, aname, acity) **flight** (fid, fdate, time, src, dest) **booking** (pid, aid, fid, fdate) Answer the following questions using relational algebra queries. **a.** Get the details about all flights from Chennai to New Delhi. **b.** Get the complete details of all flights to New Delhi. **c.** Find the passenger names for passengers who have bookings on at least one flight.	**07**

Q.5 **(a)** List and explain ACID properties with respect to Database transaction. **03**

(b) Explain RAID Levels with respect to Data Storage. **04**

(c) Explain the concept of Conflict Serializable with suitable schedules. **07**

Q.6 **(a)** List and explain types of locks in transactions. **03**

(b) With neat diagram explain data storage hierarchy so far. **04**

(c) Explain deadlock with suitable scheduling examples. **07**

Q.7 **(a)** Explain following SQL commands with syntax and significance. Grant & Revoke **03**

(b)

```
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));

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));
```

04

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

1. Find out unique values of DEPARTMENT from Worker table
2. Print details of the Workers whose SALARY lies between 100000 and 500000.
3. Print details of the Workers who have joined in Feb'2014.
4. Fetch worker names with salaries >= 50000 and <= 100000.

(c) Write short note on query processing. **07**

Q.8 **(a)** Explain following SQL commands with syntax and significance. Commit & Rollback **03**

(b)

```
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));

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));
```

04

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

1. Print details of the Workers who are also Managers.
2. SQL query to clone a new table from another table.
3. Fetch the list of employees with the same salary.
4. Fetch "FIRST_NAME" from Worker table in upper case.

(c) List the techniques to obtain the query cost. Explain any one. **07**

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