Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– III EXAMINATION – SUMMER 2020

Subject Code: 3130703   **Date:29/10/2020**

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.**

			Marks
Q.1	**(a)**	What are the main functions of a database administrator?	**03**
	(b)	Explain the difference between physical and logical data independence.	**04**
	(c)	Explain DBMS System Architecture.	**07**
Q.2	**(a)**	Describe the differences in meaning between the terms relation and relation schema.	**03**
	(b)	Write the following queries in relational algebra:	**04**
		(1) Find the names of suppliers who supply some red part.	
		(2) Find the IDs of suppliers who supply some red or green part.	
	(c)	An ER diagram can be viewed as a graph. What do the following mean in terms of the structure of an enterprise schema?	**07**
		(1) The graph is disconnected.	
		(2) The graph is acyclic.	

OR

	(c)	Draw ER diagram for university database consisting four entities Student, Department, Class and Faculty.	**07**

Student has a unique id, the student can enroll for multiple classes and has a most one major. Faculty must belong to department and faculty can teach multiple classes. Each class is taught by only faculty. Every student will get grade for the class he/she has enrolled.

Q.3	**(a)**	What is normalization? Explain 2NF.	**03**
	(b)	Explain typical query processing strategy of DBMS?	**04**
	(c)	Compute the closure of the following set F of functional dependencies for relation schema R = (A, B, C, D, E).	**07**

$$A \rightarrow BC$$

List the candidate keys for R.

OR

Q.3	(a)	What is normalization? Explain 3NF.	03
	(b)	Write short on block nested loop join.	04
	(c)	Use the definition of functional dependency to argue that each of Armstrong's axioms (reflexivity, augmentation, and transitivity) is sound.	07
Q.4	(a)	Explain hashing.	03
	(b)	What is transaction? What are the functions of commit and rollback?	04
	(c)	Write a short note on SQL injection.	07

OR

Q.4	(a)	Explain B-trees.	03
	(b)	Explain conflict serializability and view serializability.	04
	(c)	Write a short note on intrusion detection.	07

Q.5	(a)	What is trigger? Explain its type with their syntax.	03
	(b)	Write a PL/SQL block to print the given number is odd or even.	04
	(c)	Consider the following relational schemas:	07

EMPLOYEE (EMPLOYEE_NAME, STREET, CITY)

WORKS (EMPLOYEE_NAME, COMPANYNAME, SALARY)

COMPANY (COMPANY_NAME, CITY)

Give an expression in SQL for each of queries below::
  (1) Specify the table definitions in SQL.
  (2) Find the names of all employees who work for first Bank Corporation.
  (3) Find the names and company names of all employees sorted in ascending order of company name and descending order of employee names of that company.
  (4) Change the city of First Bank Corporation to 'New Delhi'.

OR

Q.5	(a)	Explain cursor and its types.	03
	(b)	Write a PL/SQL block to print the sum of even numbers from 1 to 50.	04
	(c)	Given the following relations	07

TRAIN (NAME, START, DEST)
TICKET (PNRNO., START, DEST, FARE)

PASSENGER (NAME, ADDRESS, PNRNO.)

Write SQL expressions for the following queries:

Note: Assume NAME of Train is a column of Ticket.

(1) List the names of passengers who are travelling from the start to the destination station of the train.

(2) List the names of passengers who have a return journey ticket.

(3) Insert a new Shatabti train from Delhi to Bangalore.

(4) Cancel the ticket of Tintin.