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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – WINTER 2017

Subject Code: 2130703 Date:17/11/2017

Subject Name: Database Management Systems

Time: 10:30 AM to 01:00 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)**	Define Primary key, Candidate key and Super key.	**03**
	(b)	Define DBMS. Describe significant differences between a file-processing system and a DBMS.	**04**
	(c)	Explain the ACID properties using suitable example.	**07**
Q.2	**(a)**	Explain the difference between a weak and a strong entity set.	**03**
	(b)	What are main functions of a Database Administrator?	**04**
	(c)	Design a generalization–specialization hierarchy for a motor-vehicle sales company. The company sells motorcycles, passenger cars, vans, and buses. Justify your placement of attributes at each level of the hierarchy. Explain why they should not be placed at a higher or lower level.	**07**
		OR	
	(c)	Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.	**07**
Q.3	**(a)**	What is Relational Algebra? Define Relational Algebra Operation Cross product with example.	**03**
	(b)	Describe GRANT and REVOKE commands with suitable example.	**04**
	(c)	Explain Two phase locking protocol.	**07**
		OR	
Q.3	**(a)**	List reasons why null values might be introduced into the database.	**03**
	(b)	Consider the relational database given below. Give an expression in the relational algebra to express each of the following queries: Employee (person-name, street, city) , Works (person-name, company-name, salary) Company (company-name, city) , Manages (person-name, manager-name) 1) Find the names of all employees in this database who live in the same city as the company for which they work. 2) Find the names, street address, and cities of residence of all employees who work for HCL and earn more than $10,000 per annum.	**04**
	(c)	Discuss various steps of query processing with proper diagram.	**07**
Q.4	**(a)**	Consider schema R = (A, B, C, G, H, I) and the set F of functional dependencies {A → B, A → C, CG → H, CG → I, B → H}.(Use F^+) Prove that AG → I Holds.	**03**
	(b)	Consider schema EMPLOYEE(E-ID,E-NAME,E-CITY,E-STATE) and FD = {E-ID->E-NAME, E-ID->E-CITY, E-ID->E-STATE, E-CITY->E-STATE} **1)** Find attribute closure for: $(E\text{-}ID)^+$ **2)** Find$(E\text{-}Name)^+$	**04**

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(c) Explain Aggregate Functions of SQL with suitable example. **07**

OR

Q.4 **(a)** Explain Outer Joins operations. **03**

(b) Define View. Explain with appropriate example. **04**

(c) Consider following relations and write SQL queries for given statements. **07**
Assume suitable constrains.
Instructor(ID, Name, Dept_name , Salary)
Teaches(ID, Course_id, Sec_id, Semester(even/odd),Year)

1) Write SQL query to create Instructor table.
2) Find the average salary of the instructors in computer department.
3) Find the number of instructors in each department who teach a course in even semester of 2016.
4) Find the names of instructor with salary amounts between 30000 and 50000.

Q.5 **(a)** Explain various types of LOCKs used in Lock base protocol for concurrency control. **03**

(b) What are triggers? Explain the advantages and the needs of triggers. **04**

(c) Write a PL/SQL program for inserting even numbers in EVEN table and odd number in ODD table from number 1 to 50. **07**

OR

Q.5 **(a)** Explain Cursor in PL/SQL **03**

(b) Explain deadlock with suitable example. **04**

(c) What is Normalization? Normalize below given relation up to 3NF. **07**

STUDENT:

Stu ID	Stu Name	City	Pin code	Project ID	Project Name	Course	Content
S101	Ajay	Surat	326201	P101	health	programming	C++, Java,C
S102	Vijay	Pune	325456	P102	social	WEB	HTML,PHP,ASP

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