Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(New course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 2722318 **Date: 14/12/2015**

Subject Name: Database Management Systems

Time:2:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	(i) Explain the concept of aggregation with suitable example.	**03**
		(ii) List the three desirable design goals for relational databases.	**04**
	(b)	(i) List relational algebra operators and explain with example.	**04**
		(ii) Explain distinction among the terms primary key, candidate key and super key.	**03**
Q.2	**(a)**	(i) List the main functions of a database administrator.	**03**
		(ii) Consider following schema and give relational algebraic query and SQL query for the given statements.	**04**

* employee(<u>person-name</u>, street, city)
* works(<u>person-name</u>, company-name, salary)
* company(company-name, city)

Find the names of all employees in this database who live in the same city as the company for which they work.

	(b)	Computer the closure of following set F of functional dependencies on schema R (A, B, C, D, E) and compute canonical cover for F.	**07**

A → BC CD → E B → D E → A

OR

	(b)	If the schema R (A, B, C, D, E) is decomposed into (A, B, C) and (A, D, E). Show that (i) this decomposition is lossless (ii) this decomposition is not dependency preserving for the following functional dependencies: A → BC CD → E B → D E → A	**07**
Q.3	**(a)**	Explain working of 2-phase commit protocol.	**07**
	(b)	Draw E ï R Diagram for Library Management System. Explain the mapping cardinality used. Assume suitable attributes.	**07**

OR

Q.3	**(a)**	Explain system recovery procedure with check point record concept	**07**
	(b)	Draw E-R diagram for car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Explain the mapping cardinality used. Assume suitable attributes.	**07**
Q.4	**(a)**	List and explain all possible sequences of states through which a transaction may pass with neat diagram.	**07**
	(b)	With example explain various mapping cardinalities and total participation	**07**

OR

Q.4	**(a)**	List the ACID properties. Explain the usefulness of each.	**07**

	(b)	Explain with suitable example primary key, foreign key reference and on delete cascade. Also differentiate primary key and unique key.	**07**
Q.5	**(a)**	What is deadlock? When it is occurs and how to avoid it?	**07**
	(b)	(i) Explain BCNF with example.	**04**
		(ii) Consider the relations r1(A,B,C), r2(C,D,E), andr3(E,F),with primary keys A, C, and E, respectively. Assume that r1 has 1000 tuples, r2 has 1500 tuples, and r3 has 750 tuples. Estimate the size of r1⋈ r2⋈ r3, and give an efficient strategy for computing the join.	**03**

OR

Q.5	**(a)**	What is join? Explain various types of joins with example.	**07**
	(b)	(i) Explain method of query optimization.	**04**
		(ii) Explain deadlock detection mechanism.	**03**

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