

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER-I • EXAMINATION – SUMMER • 2014****Subject Code: 610005****Date: 16-06-2014****Subject Name: Database Management System - 1****Time: 10:30 am - 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.

- Q.1** (a) Explain two-tier and three-tier architecture. Compare and contrast them. **07**
(b) Define the following terms **07**
1. BCNF
 2. Atomicity
 3. Primary Key
 4. Check constraint
 5. Data dictionary
 6. Redundancy
 7. System Catalog
- Q.2** (a) Define Normalization. Explain 1NF, 2NF, and 3NF with suitable example. **07**
(b) Draw and Explain diagram of database architecture. **07**
- OR**
- (b) What is data dictionary? Why it is needed? Describe the structure of data dictionary. **07**
- Q.3** (a) State the difference between following. **07**
1. DBMS and File Processing System
 2. Strong Attribute and Derived Attribute
- (b) What is aggregation? Discuss the concept of aggregation in detail. **07**
- OR**
- Q.3** (a) State the difference between following. **07**
1. Physical data independence and Logical data independence
 2. Data Definition Language and Data Manipulation Language
- (b) Discuss any seven Armstrong rules. **07**
- Q.4** (a) Consider a database used to record the marks that students get in different examination of different course offering. **07**
- a. Construct an alternative E-R diagram that uses only a binary relationship between students and course-offerings. Make sure that only one relationship exists between a particular student and course-offering pair, yet you can represent the marks that a student gets in different exams of a course offering.
- (b) What are data models? What are its uses? Discuss Hierarchical, Network and Relation data model in detail. **07**

OR

- Q.4 (a)** 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. The structure of the table is as under. **07**

Car insurance tables:

person (driver-id, name, address)

car (license, year,model)

accident (report-number, date, location)

participated(driver-id, license, report-number, damage-amount)

- (b)** Answer the following. **07**
1. Explain and Differentiate Strong Entity and Weak Entity
 2. Explain and Differentiate Candidate key and Super Key

- Q.5 (a)** Who is DBA? What is the role of DBA? **07**

- (b)** Explain functional dependency and Multivalued dependency. Also define the difference between them. **07**

OR

- Q.5 (a)** What is UML? Explain each notation of UML with suitable example. **07**

- (b)** Prove the statement “Every relation which is BCNF is in 3NF but converse is not true”. **07**
