

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER– II• EXAMINATION – WINTER 2017**

**Subject Code:2620003**

**Date:05/01/ 2018**

**Subject Name: DATABASE MANAGEMENT SYSTEM**

**Time: 02:30 PM – 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.

- Q.1 (a) Define: 07**
1. ACID
  2. Weak Entity
  3. Foreign Key
  4. surrogate key
  5. Generalization
  6. Domain
  7. Trigger
- (b) Define Database Management System (DBMS). What are the major components of this system? Explain each component in detail. 07**
- Q.2 (a) What are the different types of data model? 07**
- (b) What are the functions of DBA? Also Explain data dictionary. 07**
- OR**
- (b) What are integrity constraints? Explain various types of integrity constraints with suitable example. 07**
- Q.3 (a) Explain DDL, DML and DCL syntaxes with example. 07**
- (b) Construct an E-R diagram for a university registrar's office. The office maintains data about each class, including the instructor, the enrollment, and the time and place of the class meetings. For each student-class pair, a grade is recorded. Document all assumptions that you make about the mapping constraints. 07**
- OR**
- Q.3 (a) What is physical and logical data independence? Also Explain the difference between physical and logical data independence. 07**
- (b) Define the concept of aggregation. Give two examples of where this concept is useful. 07**
- Q.4 (a) Explain Boyce-Codd normal form with example? How does it differ from 3NF? 07**
- (b) What do you mean by functional dependency? Explain with example. 07**
- OR**
- Q.4 (a) Discuss insert, deletion and modification anomalies. Why they are considered bad? Illustrate with example. 07**
- (b) Explain Multivalued dependency (MVD) with example 07**
- Q.5 (a) employee (person-name, street, city) 07**  
**works (person-name, company-name, salary)**  
**company (company-name, city)**  
**manages (person-name, manager-name)**  
Consider the relational database and take primary key according your choice.  
Give an expression in the relational algebra to express each of the following

queries:

- a. Find the names of all employees who work for First Bank Corporation.
- b. Find the names and cities of residence of all employees who work for First Bank Corporation.
- c. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum.
- d. Find the names of all employees in this database who live in the same city as the company for which they work.
- e. Find the names of all employees who live in the same city and on the same street as do their managers.

(b) What is two-phase locking? How does it guarantee serializability? **07**

**OR**

Q.5 (a) What is deadlock? Discuss various protocols for deadlock prevention. **07**

(b) Explain in brief: **07**

- 1. Log-based Recovery
- 2. Timestamp
- 3. Checkpoints

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