

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA INTEGRATED - SEMESTER- II • EXAMINATION – SUMMER 2017

Subject Code: 4420603

Date: 05-06-2017

Subject Name: FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS

Time: 10.30am to 01.00pm

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)** 1. Explain the functions of DBMS. **04**
2. Define following terms: 1) Degree 2) Cardinality 3) Tuple **03**
- (b)** 1. Explain different types of attributes with example. **04**
2. Explain Categorization with a suitable example. **03**
- Q.2 (a)** 1. What is Decomposition? Explain with example. What are its desirable properties? **04**
2. What do you mean by a determinant? Explain with example. **03**
- (b)** 1. Explain MultiValuedDependency(MVD) with example. **03**
2. List and explain different types of users in DBMS. **04**
- OR**
- (b)** List and explain the Codd's rules for creating a Relational Database Model. **07**
- Q.3 (a)** 1. Explain the Set operations in Relational Algebra with example. **04**
2. Explain different types of Joins. **03**
- (b)** 1. Explain Armstrong's axioms. **05**
2. What do you mean by an intelligent and non-intelligent key? **02**
- OR**
- Q.3 (a)** Draw an E-R diagram for the following: **07**
An art gallery keeps information about artists, their names (which are unique), birthplaces, age and style of art. For each piece of artwork, the artist, the year it was made, its unique title, its type of art (e.g., painting, lithograph, sculpture, photograph), and its price must be stored. Pieces of artwork are also classified into groups of various kinds, for example, portraits, still lifes, works by Picasso, or works of the 19th century; a given piece may belong to more than one group. Each group is identified by a name (like those just given) that describes the group. Finally, galleries keep information about customers. For each customer, galleries keep that person's unique name, address, total amount spent in the gallery, and the artists and groups of art that the customer tends to like.
- (b)** 1. Explain the Disjoint and Participation constraints with suitable example. **05**
2. Draw the symbols for following: 1) Weak Entity 2) Derived Attribute **02**
- Q.4 (a)** 1. What is a Data Dictionary? Explain with its types and benefits. **05**
2. Define following terms: 1) Metadata 2) Information **02**
- (b)** List and explain the disadvantages of File System. **07**
- OR**
- Q.4 (a)** 1. List and explain the components of an E-R model. **05**
2. What do you mean by a composite entity? **02**
- (b)** Explain ANSI/SPARC architecture with diagram. **07**

- Q.5 (a)** Write Relational Algebraic forms for the following queries:
EMPLOYEE (empid, empname, city, phno)
COMPANY (compid, cmpname, city)
WORKS (empid, compid, empname, cmpname, salary)
1. Find the names of all employees who work for Softtech. **01**
 2. Find the names and cities of residence of all employees who work for NetPro and earn less than Rs. 30000. **02**
 3. Find the names of all employees in this database who live in the same city as the company for which they work. **01**
 4. Modify the database so that Mahek now lives in Delhi. **02**
 5. Find the sum of the salaries of all employees in the WORKS relation. **01**
- (b)** 1. What are the various types of Integrity constraints for Relational Model? **05**
2. Define Primary Key and Alternate Key. **02**
- OR**
- Q.5 (a)** Write expressions in Domain Relational Calculus for the following queries:
Car (carid, modelname, enginetype, cartype, company, price)
1. Find all cars which have cng engine. **02**
 2. List all the models made by Hyundai. **02**
 3. Find all models which has price more than 2,50,000. **01**
 4. Find the companies which make SUV cars. **02**
- (b)** List all the data models available. Explain any three. **07**
