

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA Integrated - SEMESTER-II • EXAMINATION – SUMMER • 2014**

**Subject Code: 4420603****Date: 23-06-2014****Subject Name: Fundamentals of Database Management Systems****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) 1. What is information? Explain information islands. **03**  
 2. Briefly explain different types of Join. **04**  
 (b) 1. Explain Relational Model of DBMS in detail. **03**  
 2. What do you mean by Physical and Logical data independence? **04**
- Q.2** (a) 1. Explain Multivalued Dependency(MVD). **03**  
 2. What is the Minimality property in RDBMS? **02**  
 3. What do you mean by domain in RDBMS? Explain with example. **02**  
 (b) 1. What is data dictionary? Explain its different types. **05**  
 2. What is decomposition? Explain with an example. **02**
- OR**
- (b) 1. Explain different types of Relational Algebra operations with example. **05**  
 2. What do you mean by Referential Integrity Constraint? **02**
- Q.3** (a) 1. Differentiate between Disjoint and Overlapping Participation Constraint giving suitable example. **05**  
 2. What is transitive functional dependency? **02**  
 (b) 1. List and Explain Armstrong's Axioms. **05**  
 2. What do you mean by degree of Relationship? **02**
- OR**
- Q.3** (a) Draw an E-R Diagram for the following: **07**  
 A bus company owns a number of buses. Each bus is allocated to a particular route. Although some routes may have several buses, each route passes through a number of towns. One or more drivers are allocated to each stage of a route, which corresponds to a journey through some or all of the towns on a route. Some of the towns have a garage, where buses are kept and each of the buses are identified by the registration number and can carry different numbers of passengers, since the vehicles vary in size and can be single or double decked, each route is identified by a route number and information is available on the average number of passengers carried per day for each route. Drivers have an employee number, name, address and sometimes a telephone number.
- (b) 1. Explain Specialization and Generalization. **05**  
 2. What is the truth value of an atom? **02**
- Q.4** (a) 1. Explain different types of Attributes in DBMS. **04**  
 2. Explain difference between ER and EER model. **03**  
 (b) Explain ANSI/SPARC Architecture of DBMS in detail. **07**
- OR**
- Q.4** (a) 1. Explain desirable properties of Decomposition. **04**  
 2. Differentiate between Primary Key, Candidate Key and Alternate Key. **03**  
 (b) Explain Tuple Relational Calculus giving suitable example/s. **07**

- Q.5 (a)** Write Relational Algebraic forms for the following queries :  
EMP(empno, ename, designation, manager\_id, hiredate, salary, commission, deptno)
1. List all employees who are managers. **01**
  2. List all employees who are working in department number 10,20,30 and are not managers. **02**
  3. Find annual salary for all employees. **02**
  4. List all distinct designations from EMP. **02**
- (b)** Explain DBMS Vs. File System. **07**

**OR**

- Q.5 (a)** Write expression in Domain Relational Calculus for the following queries :  
Teacher(ID, name, dept\_name, salary, Course\_name, Semester)
1. Find all teachers whose salary is greater than 40,000. **01**
  2. Find the teachers of department 'Computer Science'. **02**
  3. List the courses taught by the teachers of Semester-2. **02**
  4. Find the department where course 'DBMS' is taught. **02**
- (b)** Explain Components of DBMS with Diagram. **07**

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