



**P.E.S. College of Engineering, Mandya - 571 401**  
*(An Autonomous Institution affiliated to VTU, Belgaum)*  
**Second Semester, Master of Computer Applications (MCA)**  
**Semester End Examination; June - 2016**  
**Database Management System**

Time: 3 hrs

Max. Marks: 100

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

**UNIT - I**

- 1 a. Explain the advantages of using a Database Management System. 10  
 b. Explain the actors on the scene and workers behind the scene. 10
- 2 a. What is data independence? Explain its types. 7  
 b. Explain, when not to use a DBMS? 5  
 c. Explain the main characteristics of the database approach. 8

**UNIT - II**

- 3 a. Explain the different attribute types with example. 10  
 b. Draw an ER diagram for the company database system by assuming the suitable entities, attributes and relationships. 10
- 4 a. Explain the following with an examples : 10  
 i) Entity type                      ii) Entity sets                      iii) Relationship instance  
 iv) Domain of attributes        v) Weak entity set.
- b. What is cardinality ratio? Explain different types of cardinality ratios with suitable example. 8  
 c. Compare String entity set with weak entity set. 2

**UNIT - III**

- 5 a. Explain the relational algebra operations UNION, INTERSECTION, MINUS, SET DIFFERENCE and Cartesian product with examples. 10  
 b. Explain ER to relational mapping algorithm with suitable example. 10
- 6 a. Describe left outer join, right outer join and full outer join with example. 10  
 b. Consider the following relational schema and answer the following queries using relational algebra.
- Employee (SSN, Name, DOB, Addr, Sex, Salary, Super\_SSN, DNo)  
 Dept (DNo, Dname, SSN, mgrstartdate)  
 Projects ( PNo, Pname, Plocation, DNo)
- i) Retrieve the name and salary of all employees working for department 6 10  
 ii) Find the name and address of the employees who earn more than 25000 rupees  
 iii) List the name and location of the projects not controlled by department 2  
 iv) Find the employees who work for department 4 and salary is greater than 25,000 rupees.  
 v) Select the tuples for all employees who either work in dept 2 and make over ` 10,000 or work in dept 3 and make over ` 29,000.

**UNIT - IV**

- 7 a. Explain all options of SELECT statement in SQL, give examples for each. 10
- b. Explain the additional features of SQL. 10
- 8 a. Explain the following with examples : 10
- i) Views in SQL            ii) Embedded SQL.
- b. By considering the Relation schema of 6b, Solve the following queries :
- i) Retrieve the birth date and address of the employees whose name is 'John B smith'.
- ii) Retrieve the name and address of all employees who work for the 'Research' department
- iii) For each employee, retrieve the employee's first and last name and the first and last name of his/her immediate supervisor. 10
- iv) Retrieve all employees whose address is in Houston Texas
- v) Retrieve all employees in Department 5 whose salary is between \$30,000 and \$40,000.

**UNIT - V**

- 9 a. Briefly explain Informal design guidelines for Relation schema. 10
- b. What is normalization? Explain First, Second and Third normal forms with suitable example. 10
- 10 a. Describe the locking techniques for concurrency control. 10
- b. Briefly explain the ACID properties. 5
- c. What are WR, RW and WW conflicts? Explain. 5

\* \* \* \*