



**Fifth Semester B.E. Degree Examination, Feb./Mar. 2022**  
**Database Management Systems**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.**

**PART – A**

- 1 a. Discuss the main characteristics of database approach and how it differs from traditional file system. (08 Marks)  
b. With a neat diagram, explain Three Schema Architecture. (08 Marks)  
c. What are the responsibilities of a Database Administration (DBA)? (04 Marks)
- 2 a. Define the following terms with examples :  
i) Entity      ii) Primary key      iii) Multi valued attribute      iv) Cardinality ratio  
v) Foreign key. (10 Marks)  
b. Draw an E – R diagram for Hospital Management. Assume your own entities (minimum 5 entities), attributes and relationships. Mention the Cardinality ratio. (10 Marks)
- 3 a. Consider the following schema for a Company database :  
Employee (Name, Ssn, Address, Bdate , Sex, Salary, Dno).  
Department (Dname, Dnumber , Mgr\_Ssn , Mgr\_Start\_date)  
Dept\_locations (Dnumber , Dlocation)  
Project (Pname , Pnumber , Plocation, Dnum)  
Works\_on (Essn, Pno, Hours)  
Dependent (Essn, Dependent\_Name, Sex, Bdate, Relationship).  
Write the queries in Relational algebra to :  
i) Retrieve the name and address of all employees who work for the Research department.  
ii) Find the names of the employees who work on all projects controlled by dept\_number 5.  
iii) For every project located in Stafford , list the project number, the controlling department number and the department Managers name, address and birth date.  
iv) Retrieve the names of employees who have no dependent. (08 Marks)  
b. Discuss the following relational algebra operations with example for each :  
i) JOIN      ii) SELECT      iii) UNION      iv) PROJECT. (12 Marks)
- 4 a. Consider the following relations for a database that keeps track of business trips of sales persons in a Sales office :  
SAILORS (Sid, Sname, Rating , Age)  
BOATS (Bid , Bname , Colour)  
RESERVES (Sid, Bid , Day)  
Specify the following queries in SQL :  
i) Find the names of Sailors who have reserved red boat  
ii) Find the names of Sailor who have reserved a red or a green boat.  
iii) Find the name of Sailors who have all boats called Inter lake. (12 Marks)  
b. What are the different Aggregate functions in SQL? Explain with example. (08 Marks)

**PART - B**

- 5 a. Explain Insert, Delete and Update statements in SQL with examples. (12 Marks)  
b. Explain the following : i) Views ii) Embedded SQL. (08 Marks)
- 6 a. Explain Informal design guidelines for relation schemas. (08 Marks)  
b. Explain the First , Second and Third Normal Forms with examples. (12 Marks)
- 7 a. Explain Multivalued dependencies and Fourth Normal Form (4NF) with example. (10 Marks)  
b. Explain i) Inclusion dependencies ii) Domain key normal forms. (10 Marks)
- 8 a. Explain the ACID properties. (10 Marks)  
b. Briefly discuss on the two phase locking protocol used in Concurrency control. (10 Marks)

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