



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Computer Science and Engineering

Semester End Examination; July / Aug. - 2022

Database Management Systems

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Design an ER model for a given example from real world description.

CO2: Design relational models for a given application using schema definition and constraints.

CO3: Develop complex queries using SQL to retrieve the required information from database.

CO4: Apply suitable normal forms to normalize the given database.

CO5: Determine the roles of concurrency control in database design.

Note: I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any Two sub questions (from a, b, c) for a Maximum of 18 marks from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	Define data Independence. Define DBMS.	2	L3	CO1	1,2,3,5 9
b.	Define primary and foreign keys.	2	L3	CO2	1,2,3,5 9
c.	Demonstrate aliasing using a relational algebra operation.	2	L3	CO3	1,2,3,5 9
d.	Demonstrate database constraints using SQL query.	2	L3L2	CO4	1,2,3,5 9
e.	List advantages of Normalization.	2	L3	CO5	1,2,3,5 9
II : PART - B		90			
UNIT - I		18			
1 a.	Discuss three schema architecture with a neat diagram. Also explain different types of data independence.	9	L3	CO1	3,1,2,9
b.	Elaborate the advantages of using the DBMS.	9	L2L4	CO1	3,1,2,9
c.	Discuss different database languages and interfaces.	9	L3	CO1	3,1,2,9
UNIT - II		18			
2 a.	List and explain the different type's attributes with examples for each. Also explain concept of weak entity.	9	L2 L4	CO2	1,3,9
b.	Designs an ER Diagram for keeping track of information about Bank Database, Taking into account 4 entities specify all the constraints assumed.	9	L3	CO2	1,3,9
c.	Elaborate all the structural constraints in designing entity relationship diagram.	9	L3	CO2	1,3,9

Contd... 2

UNIT - III**18**

3 a. Consider the following schema and Design the following queries using the Relational algebra.

PARTS (Pno, pname, price, Olevel)

CUSTOMERS (Cno, Cname, street, zip, phone)

EMPLOYEES (Eno, ename, zip, Bdate)

ZIP_CODES (Zip, city)

ORDERS(Ono, Cno, Eno, Received, Shipped)

ODETAILS(Ono, Pno, qty)

i) Retrieve the names and cities of employees who have taken orders for parts costing more than 50000

ii) Retrieve the pairs of customer number values of customer who live in the same Zip code

iii) Retrieve the names of customers who have not placed an order

iv) Retrieve the names of customers who have placed exactly two orders

b. Discuss the process of relational database using ER-to-Relational Mapping.

c. Discuss constraint violations during all three operations in relational model.

9 L3 CO3 3,2,1,9

9 L3 CO3 3,2,1,9

9 L3 CO3 3,2,1,9

UNIT - IV**18**

4 a. Develop the following queries in SQL for the given relational schema

SAILORS (Sid, sname, rating, age)

BOATS (Bid, bname, color)

RESERVE (Sid, Bid, day)

i) Retrieve the sailors names who have reserved red and green boats

ii) Retrieve the sailors names with age over 20 years and reserved black boat

iii) Retrieve the number of boats which are not reserved.

iv) Retrieve the sailors names who have reserved green boat on Monday

9 L3 CO4 1,2,9

Contd... 3

- b. Discuss the SIX clauses of SQL retrieval query along with the properties of each clause. Which of the six clauses are required and which are optional? 9 L3 CO4 1,2,9
- c. Discuss the Update, Delete and insert statement in SQL with example. 9 L3 CO4 1,2,9

UNIT - V**18**

- 5 a. Examine the relation R (A, B, C, D, E, F) and FD = {A → B, C → DF, AC → E, D → F} what is the key and highest normal form of R? 9 L3 CO5 1,2,9
- b. Elaborate informal design guidelines for relational schemas. 9 L3 CO5 1,2,9
- c. Consider the following relation;
Car_sale(car#, datesold, salesperson#, commission%, discount_amt)
FD = {datesold → discount_amt, salesperson# → commission%}
Based on given key is this relation in 1NF, 2NF or 3NF? Why or why not? 9 L3 CO5 1,2,9

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