



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

(An Autonomous Institution affiliated to VTU, Belagavi)

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

Semester End Examination; August - 2023

Database Management System

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			
1 a.	Explain logical and physical data independence.	2	L2	CO1	PO 1,2,3
b.	List the characteristics of relation.	2	L2	CO2	PO 1,2,3
c.	Write a relational algebra query to retrieve the birth date and address of the employee whose name is 'John B Smith'.	2	L2	CO3	PO1,2,3,9,11
d.	Give an example for Insert statements in SQL.	2	L2	CO4	PO1,2,3,9,11
e.	Define 5NF.	2	L2	CO5	PO1,2,3,9,11
II : PART - B		90			
UNIT - I		18			
2 a.	Discuss the advantages of using a DBMS and the capabilities that a good DBMS should possess.	9	L2	CO1	PO1,2,3,9,11
b.	Define database management system. Explain the characteristics of database approach.	9	L2	CO1	PO1,2,3,9,11
c.	Develop an ER diagram for Library database. Assume most relevant entities (at least five entities) and their respective attributes. Show all possible cardinality ratios.	9	L4	CO1	PO1,2,3,9,11
UNIT - II		18			
3 a.	Explain the following with examples:				
	i) Domain constraints ii) Entity integrity constraints	9	L3	CO2	PO1,2,3,9,11
	iii) Constraints on NULL value iv) Referential integrity constraints				
b.	Explain SELECT, PROJECT and RENAME operations in detail.	9	L2	CO2	PO1,2,3,9,11
c.	Explain relational algebra operation for set theory with example.	9	L2	CO2	PO1,2,3,9,11

UNIT - III**18**

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|------|---|---|----|-----|--------------|
| 4 a. | Discuss ER-to-Relational mapping algorithm in detail. | 9 | L2 | CO3 | PO1,2,3,9,11 |
| b. | List and explain the different data types available for attributes. | 9 | L2 | CO3 | PO 1,2 |
| c. | Explain the six clauses of SQL with an example. | 9 | L4 | CO3 | PO1,2,3,9,11 |

UNIT - IV**18**

- 5 a. Consider the ONLINESHOP database:
- INVENTORY(Iid, Iname, location)
- PRODUCT (Pid, pname, datesold, description, Iid)
- SALE (Sid, Pid, datesold, price, amount_sold)
- ORDERHISTORY (Hist_id, product_name, Pid)
- CUSTOMER (Cid, name, address, Pid)
- ORDER (Order_id, Cid, tracking_no)
- Write SQL queries for the following:
- i) Display the customer information who have purchased on
"01-02-2023"
- ii) Retrieve the product details that are shipped from the same
inventory
- iii) Retrieve the names of customers who have ordered the product
cost less than 20,000
- | | | | | | |
|----|--|---|----|-----|----------------|
| b. | Explain informal design guidelines for relational schema with
suitable examples. | 9 | L3 | CO4 | PO1,2,3,9,11 |
| c. | i) How is view created and dropped? What are the problems
associated with updation of VIEW. | 9 | L3 | CO4 | PO1,2,3,5,9,11 |
| | ii) How are triggers and assertion defined in SQL? Explain. | | | | |

UNIT - V**18**

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|------|--|---|----|-----|--------------|
| 6 a. | Explain 2NF and BCNF with suitable example. | 9 | L3 | CO5 | PO1,2,3,9,11 |
| b. | Explain the following with suitable example: | | | | |
| | i) Lost update problem | 9 | L3 | CO5 | PO 1,2,3 |
| | ii) Dirty read problem | | | | |
| c. | i) Explain 3NF with suitable example. | 9 | L3 | CO5 | PO1,2,3,9,11 |
| | ii) What are ACID properties? Explain. | | | | |

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