U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Information Science and Engineering **Duration: 3 hrs.**
Course Code: 23IS4PCDBM **Max Marks: 100**
Course: Database Management System

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

		UNIT - I	CO	PO	Marks
1	a)	Differentiate between database approach and the file processing approach.	CO1		10
	b)	Draw an ER Diagram for the University management system. Specify the requirements assumed and accordingly represent entities (Minimum of 4 entities), attributes, cardinality ratio and type of participation.	CO2	PO1	10
		UNIT - II			
2	a)	Examine the different types of constraints on relational model.	CO2	PO1	10
	b)	Consider the following schema for a company database: Employee (Name, SSN, Address, Sex, Salary, Dno) Department (Dname, Dnumber, MGRSSN, MGRSTART Date) Dept-Locations (Dnumber, Dlocations) Project (Pname, Pnumber, Plocations, Dnum) Works-On (ESSN, PNo, Hours) Dependent (ESSN, Dependent-name, Sex, Bdate, Relationship) Give the queries in SQL: i) Retrieve the names and address of employees who work for "Research" Department. ii) Retrieve all employees in Dept. 5 whose salary is between 30,000 and 40,000. iii) Retrieve the number of employees working for each department along with their average salary. iv) Retrieve the names of employees and the no. of hours each employee works on the project.	CO3	PO2	10
		UNIT - III			
3	a)	Consider the following schema and write the relational algebra expressions for the queries given below: SAILORS(Sid, Sname, rating, age) BOATS(bid, bname, color) RESERVES(sid, bid,day) (i) Find names of sailors who have reserved green boat	CO2	PO1	10

			(ii) Find the colors of boats reserved by "Ramesh" (iii) Find names of sailors who have reserved a red or a green boat. (iv) Find the "sids" of sailors with age over 20 who have not registered a red boat.			
		b)	Demonstrate the following operations in MongoDB : i) Create a sample database named School ii) List all the existing database iii) Create a collection with three fields (Students, Teachers, Office) in the school database iv) Insert two documents in the students collection db.Students.insertMany v) View the documents inserted in the students collection	***CO3***	***PO3***	**10**
			UNIT - IV			
	4	a)	Examine insertion, deletion, and modification anomalies. Why are they considered bad? Illustrate with examples.	***CO2***	***PO2***	**10**
		b)	Consider the universal relational schema R(A,B,C,D,E,F,G,H,I,J) and a set of following functional dependencies FD = { AB→C, A→DE, B→F, F→GH, D→IJ} Determine the keys for R? Decompose R into 2nd normal form.	***CO3***	***PO2***	**10**
			OR			
	5	a)	What is normalization? Explain third normal form with an example.	***CO2***	***PO1***	**10**
		b)	Define functional dependency and its types with an example for each.	***CO1***		**05**
		c)	Identify the highest normal form for the given relation R(A,B,C,D,E,F,G,H) and the following functional dependencies: {ABC→DE, E→GH, H→G, G→H, ABCD→EF}	***CO2***	***PO1***	**05**
			UNIT - V			
	6	a)	Differentiate between serial schedule and serializable schedule	***CO1***		**06**
		b)	Illustrate the desirable properties of a transaction execution with an example.	***CO1***		**08**
		c)	Provide the comparison between binary locks and multimode locks.	***CO2***	***PO1***	**06**
			OR			
	7	a)	Examine strict two-phase locking protocol. How does it guarantee serializability?	***CO2***	***PO1***	**10**
		b)	Provide the algorithm for checking the schedule S as conflict serializable or not. For the given schedule S check whether it is conflict serializable? S: R1(A), R2(A), R1(B), R2(B), R3(B), W1(A), W2(B)	***CO3***	***PO2***	**10**

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