22MCA21

SecondSemester MCA Degree Examination, June/July 2024
Database Management Systems

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	CO
Q.1	a.	Define database management system. List and explain its characteristics.	10	L1	CO1
	b.	Explain 3-schema architecture. What do you mean by data independence? Explain briefly about different types of it.	10	L1	CO1
		OR			
Q.2	a.	With a neat diagram, explain the DBMS component modules.	10	L1	CO1
	b.	Briefly explain types of attributes in E-R model.	04	L1	CO1
	c.	Construct an ER-diagram for company database with proper assumption.	06	L3	CO3
		Module – 2			
Q.3	a.	Discuss about domain constraint and key constraint and constraint on NULL values.	10	L2	CO1
	b.	Explain the following with example : (i) SELECT (ii) PROJECT (iii) RENAME (iv) Division Operation	10	L2	CO4
		OR			
Q.4	a.	Consider the following schema : EMPLOYEE(Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Dno) DEPARTMENT(Dname, Dnumber, Mgr-ssn, Mgr-start, date) PROJECT(Pname, Pnumber, Plocation, Dnum) WORKS_ON(Essn, Pno, Hours) Write the queries in relational algebra for following : (i) Reterieve tuples for all employees who either work in department 4 and make over \$25,000 per year or work in department 5 and make over \$30,000. (ii) Retrieve each employee's first and last name and salary. (iii) Retrieve the names of employees who work on all the projects that 'John Smith' works on. (iv) Retrieve the name and address of all employees who work for the 'Research' department.	10	L3	CO4
	b.	Summarize the steps involved in relational database using ER-to-Relational mapping.	10	L3	CO4
		Module – 3			
Q.5	a.	Bring out the different clauses of SELECT-FROM-WHERE-GROUP BY-HAVING with an example for each.	10	L2	CO2

	b.	Consider the following Schema :
		 STUDENT(USN, Name, DOB, Branch, Mark1, Mark2, Mark3, Total, GPA).
		 Execute the following SQL queries :
		    (i) Update the column total by adding the columns Mark 1, Mark 2, Mark 3.
		    (ii) Find the students whose name starts with the alphabet "S".
		    (iii) List the students who are studying in a particular branch of study.
		    (iv) Find the students whose name ends with the alphabets "AR".
		    (v) Delete the student details whose USN is given as 1001.
			10	L3	CO2

		OR			
Q.6	a.	What are views in SQL? Explain the strategies to implement views in SQL.	10	L2	CO1
	b.	Explain in detail about assertion and triggers in SQL.	10	L2	CO2
		Module – 4			
Q.7	a.	Discuss the informal design guidelines for relational schema.	08	L3	CO4
	b.	Briefly explain the 1st, 2nd, 3rd and Boyce Codd normal form.	12	L2	CO3
		OR			
Q.8	a.	Explain and write an algorithm on relational decomposition into BCNF with non-additive join property.	10	L2	CO4
	b.	Discuss about nulls, dangling tuples and alternative relational designs.	10	L2	CO4
		Module – 5			
Q.9	a.	Discuss, why concurrency control is needed with proper example.	10	L2	CO3
	b.	Describe the desirable properties of transactions.	10	L2	CO3
		OR			
Q.10	a.	Briefly explain the importance of strict two-phase locking for concurrency control.	10	L2	CO3
	b.	Explain validation (optimistic) techniques and snapshot isolation concurrency control.	10	L2	CO3

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