Code: 21F00105

MCA I Semester Supplementary Examinations July 2024

DATA BASE MANAGEMENT SYSTEMS

(Master of Computer Applications)

Time: 3 hours | Max. Marks: 60

Answer all the questions

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1	(a)	Discuss about the different database system applications.	6M
	(b)	Discuss about different levels of data abstraction.	6M
		OR	
2	(a)	What is a data model and discuss about the different types of data models.	6M
	(b)	What are the functions of database administrator?	6M
3	(a)	Explain left outer join and right outer join with examples.	6M
	(b)	Explain about complex integrity constraints in SQL triggers.	6M
		OR	
4	(a)	Construct an ER diagram for online train reservation system such as irctc.co.in.	6M
	(b)	Describe the relational database rules proposed by Dr.E.Fcodd.	6M
5	(a)	Discuss about the basic structure of ER diagram.	6M
	(b)	Discuss about the significance of mapping cardinalities and its different types.	6M
		OR	
6	(a)	Define a functional dependency. List and discuss any three inference rules for functional dependencies. Give relevant examples.	6M
	(b)	Compute the closure of the following set F of functional dependencies for relation schema r (A, B, C, D, E). $A \rightarrow BC$ $CD \rightarrow E$ $B \rightarrow D$ $E \rightarrow A$ List the candidate keys for R.	6M
7	(a)	Give an overview of the steps involved in processing a query with a neat diagram.	6M
	(b)	Discuss about the Selection operation performed using File Scans and Indices.	6M
		OR	
8	(a)	Give an overview of catalog information.	6M
	(b)	What is materialized view and why is it important?	6M
9	(a)	Discuss about transaction state diagram and all its states that a transaction goes through during its execution.	6M
	(b)	Discuss about buffer management.	6M
		OR	
10	(a)	What is 2-phase locking protocol? How does it guarantee serializability.	6M
	(b)	Discuss about handling deadlocks.	6M

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Code: 21F00105

MCA I Semester Regular & Supplementary Examinations February 2024

DATABASE MANAGEMENT SYSTEMS

(Master of Computer Applications)

Time: 3 hours Max. Marks: 60

Answer all the questions

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1	(a)	Explain briefly about the purpose of data base management systems.	6M
	(b)	How database management system overcomes the disadvantages of file system?	6M
		OR	
2	(a)	With help of a neat diagram, explain the basic architecture of a database management system.	6M
	(b)	Draw a Schema diagram for the university database.	6M
3	(a)	SQL allows a foreign-key dependency to refer to the same relation, as in the following example: create table manager (employee name varchar (20) not null, manager name varchar (20) not null, primary key employee name, foreign key (manager name) references manager on delete cascade) Here, employee name is a key to the table manager, meaning that each employee has at most one manager. The foreign-key clause requires that every manager also be an employee. Explain exactly what happens when a tuple in the relation manager is deleted.	6M
	(b)	Discuss about integrity constraints.	6M
		OR	
4	(a)	What are the advanced aggregation features in SQL and discuss their need?	6M
	(b)	What is a weak entity set? How is it handled in ER diagram?	6M
5	(a)	Explain the need for normalization with suitable example scenarios.	6M
	(b)	Describe about the multi-valued dependencies with suitable examples.	6M
		OR	
6	(a)	Suppose that we decompose the schema r (A, B, C, D, E) into r1 (A, B, C) r2 (A, D, E). Show that this decomposition is a lossless decomposition if the following set F of functional dependencies holds: $A \rightarrow BC$ $CD \rightarrow E$ $B \rightarrow D$ $E \rightarrow A$	6M
	(b)	Explain the distinctions among the terms primary key, candidate key, and super key.	6M
7	(a)	What is the purpose of sorting in SQL queries?	6M
	(b)	Explain external sort - merge algorithm.	6M
		OR	
8	(a)	Discuss the need for optimizing a query.	6M
	(b)	How can we say that two relational-algebra expressions are equivalent?	6M
9	(a)	Explain ACID properties of a transaction.	6M
	(b)	Explain about different types of locks.	6M
		OR	
10	(a)	Explain the steps involved in recovering the system from failure with neat sketch.	6M
	(b)	Explain about view scheduling.	6M

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MCA I Semester Regular & Supplementary Examinations March 2023

DATABASE MANAGEMENT SYSTEMS

(For students admitted in 2021 & 2022 only)

Time: 3 hours **Max. Marks: 60**

Answer all the questions

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1 (a) Explain about various database users and administrators in DBMS. 6M

(b) What is NULL. What is its importance. How are these values handled in relational model. 6M

OR

2 (a) With a neat diagram, explain the architecture of DBMS. 6M

(b) Explain database schema with an example. 6M

3 (a) What is an integrity constraint. Explain its enforcement by DBMS with illustrative example. 6M

(b) Explain the usage of 'group by' and 'having' clauses in SQL with examples. 6M

OR

4 (a) Write SQL Queries for following set of tables: EMPLOYEE (EmpNo, Name, DoB, Address, Gender, Salary, DNumber) 6M
DEPARTMENT (DNumber, Dname, ManagerEmpNo, ManagerStartDate).

i) Display the Age of 'male' employees
ii) Display all employees in Department named 'Marketing'.
iii) Display the name of highest salary paid 'female' employee.
iv) Which employee is oldest manger in company.

(b) What is a trigger. How to create it. 6M

5 (a) Discuss the process of converting ER model to Relational model. 6M

(b) State 1NF, 2NF and 3NF and explain with examples. 6M

OR

6 (a) Define ER model and explain the following kinds of constraints that can be specified in the ER diagram, and give an example of each: i) key constraint ii) participation constraint. 6M

(b) What is Functional Dependency. Explain types and properties of FD's. 6M

7 (a) Describe the components of query processor and query evaluation engine with necessary diagram. 6M

(b) How to transform relational expression. 6M

OR

8 (a) Write a short note on sorting operation in query processing. 6M

(b) What is materialized view. Explain query optimization with materialized view. 6M

9 (a) What is Transaction. List and explain the properties of Transaction. 6M

(b) Discuss two-phase lock based protocol and time-stamped protocol and compare them with suitable examples. 6M

OR

10 (a) What is serializability. Explain view serializability in detail. 6M

(b) Describe the three phases of the ARIES recovery method. 6M
