SVKM'S NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT ENGINEERING / SCHOOL OF TECHNOLOGY MANAGEMENT ENGINEERING

Program: MCA Year: I Semester : I

AcademicYear: 2022-2023

Subject: Database Management Systems

Marks: 100

Time: 11.00 am - 02.00 pm

Durations: 3 (Hrs)

Date : 22 February 2023

No. of Pages: 03.

Re-Examination (2022-23)

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

1) Question No. 1 is compulsory.
2) Out of remaining questions, attempt any 4 questions.
3) **In all 5 questions to be attempted.**
4) All questions carry equal marks.
5) **Answer to each new question to be started on a fresh page.**
6) **Figures in brackets on the right hand side indicate full marks.**
7) **Assume Suitable data if necessary.**

Q1		Answer the following questions:	[20]
CO- 3; SO- 2; BL-3	1.	Define transaction and explain ACID properties during transaction in DBMS.	[5M]
CO- 1; SO- 2; BL-3	2.	Explain the following terminologies and notations with respect to ER diagram 1. Strong and Weak entity sets 2. Multivalued and Derived attributes 3. Weak relationship	[5M]
CO- 2; SO- 1; BL-1	3.	Consider the following schema: Works (person_name, company_name, salary) lives (person_name, street, city) located_in (company_name, city,operating_years) Write **RELATIONAL** algebra and **SQL** queries for the following: 1. Find the names of the persons who work for company 'xyz' with a salary more than 10000 2. List the names of the persons who work for company 'abc' along with the cities they live in. 3. Find the persons who work for company that is located in city "Mumbai" and has 5 operating_years.	[6M]
CO- 4; SO- 2; BL-1	4.	Write the difference between SQL and NOSQL databases. What is the structure followed by Mongo to store data. Explain with syntax	[4M]

Q2 CO-1; SO-1; BL- 3	1.	Design ER diagram for an "XYZ University". The University has professors, students and courses. Professors can be permanent or contractual. Professors have dependents. Courses are taught by professors. Students' information along with the courses, they register for is stored in the database. There is no limit on the courses that a student can register for. There are some courses which are not yet registered. (Assume necessary data: attributes and cardinalities, wherever required).	[8M]
	2.	Reduce the above ER diagram into relational tables. Specify primary and foreign keys.	[6M]
	3.	What are relationship cardinalities. Explain with example.	[6M]
Q3 CO-2; SO-1; BL-1	1.	Consider the Traveler DATABASE Traveler (tid:int, tname:string, age:int) Flight (fid:int, fname:string, company:string) Book (tid:int, fid:int, bdate:date,fare:int) Based on the above schema, Answer the following questions. 1. Write SQL query to display the company of the flight booked by traveler named "Rahul". 2. Write SQL and relational algebra query to display the details of travelers whose name starts with "A". 3. Write SQL query to display traveler details who booked flight "airflow". 4. Write SQl query to display the names of travelers who have booked flight called "airflow" on 20th October, 2022. 5. Write SQL query to display the name and age of the travelers who have reserved both "airflow" and "airdeep" flights. 6. Write SQL and relational algebra queries to display the age of all travelers flying by flight id "123". 7. Write SQL and relational algebra query to display the details of flights booked on 20th October, 2022. 8. Write SQL query to display the average fare of each flight. Display fare and fid. 9. Write SQL query to update flight name to "airflow" of flight id 123.	[12M+8M]
	2.	Write about **union, any, all, in, or, and** operators of SQL with example.	
Q4 CO-2; SO-2; BL-2,3	1.	Explain super key, candidate key, primary key with an example.	[6M]
	2.	What are views in SQL? Can views be updated?	[4M]
	3.	Explain what the following SQL queries will do and write output for the schema given.	[4M]

		EMP_ID PROJ_CODE EMP_NAME EMP_SALARY EMP_DOB E100 10 XYZ 1000 22-11-1984 E101 10 PQR 1500 02-01-1983 E102 12 ABC 1700 08-09-1985 1. select EMP_ID, EMP_NAME where EMP_DOB='22-11-1984'; 2. select sum(EMP_SALARY) group by PROJ_CODE; 3. select concat(SUBSTRING(EMP_ID, 2) ,EMP_NAME) AS EMP_DETAILS; 4. select dateadd(month, 2, EMP_DOB) AS new_dob;	
	4.	Describe any 6 relational algebra operators.	[6M]
Q5 CO-3; SO-1; BL-2	1.	Given Relation, R= (A, B, C, D, E) and Functional Dependencies F = {{A} →{BC}, {CD} →{E}, {B}→{D}, {E}→{A}}. Find closures, candidate key and the highest normal form satisfied by the given relation. Justify your answer. Justify answer for NF in detail.	[8M]
	2.	A. Explain BCNF with example. B. Which normal form does the following customer relation violate? Justify your statement. Show decomposition steps to normalize it. Customer ID | NAME | Account_No | Bank_No | Bank	[3M+5M]
	3.	What are the problems caused by redundant storage of data?	[4M]
Q6 CO-3; SO-2,7; BL-3	1.	Explain conflict and view serializability.	[6M]
	2.	Is the following schedule view serializable? Justify your answer. Draw precedence graph: S1: R1(A), W2(A),R3(A),W1(A),W3(A)	[10M]
	3.	What is a schedule? When do you say that a concurrent schedule is serializable? Quote an example to explain the same.	[4M]
Q7 CO-1,2; SO- 7; BL- 1	1.	Answer the following 1. Write about Natural Join and Inner join with example. 2. Explain Specialization and generalization in ER diagram with example. 3. Explain about different data models. 4. Referential integrity constraint with an example.	[4M] [6M] [6M] [4M]

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