SVKM's NMIMS
MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING /
SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING

Academic Year: 2022-23

Programme: MCA   Year: I   Semester: I

Subject: Database Management Systems

Date: 14 December 2022

Marks: 100
Time: 10.30 am - 01.30 pm
Durations: 3 (Hrs)
No. of Pages: _3_

Final Examination

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- 1; SO- 2; BL- 2	1.	Draw and explain the three-level architecture of the database system.	[4M]
CO- 3; SO- 1; BL-1	2.	Explain 2NF,3NF and BCNF with example.	[6M]

CO- 2;
SO- 1;
BL-2
	3.	Consider the following schema:
		employee (employee_id: int, dept_id:int, emp_name:string,salary:int)
		department (dept_id:int,d_name:string, location:string)
		Write **RELATIONAL** algebra and **SQL** queries for the following:
		   1. List out all the employee details who work in department "HR" and whose salary is less than 10000.
		   2. List the details of the employees whose department location is "Mumbai".
		   3. Display those employee details who do not work for department "admin".
			[6M]

CO- 4; SO- 7; BL-1	4.	What are the features of MONGO DB. Explain collection and document in MONGODB?	[4M]
Q2 CO-1; SO-1; BL-1	1.	Design database for an "XYZ company". The company keeps track of product, category, sales, invoice, customers. Customer buys product and then an invoice is generated. Every product's sales data is maintained. Product category can be "furniture" or "electronics". (Assume necessary data: attributes and cardinalities,	[8M]

		wherever required).		
	2.	Reduce the above ER diagram into relational tables. Specify primary and foreign keys.	[6M]	
	3.	Explain the terms entity, attribute, relationship and cardinalities, simple and composite attributes, with respect to ER diagram with an example.	[6M]	
Q3 CO-2; SO-2,7; BL-2	1.	Consider an insurance DATABASE client (cid:int, cname:string, age:int, pid:int) policy (pid:int, pname: string, issue_date: date, amount:int, claim_id:int) claim (claim_id:int, claim_settled_date: date) Based on the above schema, Answer the following questions. 1. Write SQL and relational algebra query to display policy taken by client named "xyz". 2. Write SQL and relational algebra to display the details of all the clients who have taken policy called "life". 3. Write SQL and relational algebra query to display the policy details settled on 22nd Oct,2022. 4. Write SQL query to display the average age of clients who have taken policy called "vehicle" 5. Write SQL and relational algebra query to display details of the client who have taken "vehicle" insurance and the amount is greater than 40000. 6. Write SQL query to display maximum amount of each policy. 7. Write SQL query to display details of client whose age is greater than age of client named "xyz" 8. Write SQL query to display count of those policies where number of clients is >400	[12M]	
	2.	Write about DDL and DCL commands with syntax	[8M]	
Q4 CO-2; SO-1,2; BL-2	1.	Write about key, domain, referential integrity, constraints in SQL with syntax.	[6M]	
	2.	What is the difference between table and view? Can view exists without table? Is a view updated when table is updated? Explain. Write an example to create a view.	[5M]	
	3.	What is the use of joins? Explain 5 types of joins in SQL with example.	[5M]	
	4.	Explain what the following SQL queries will do and write output for each of them for the schema given.	[4M]	

Student_ID	course_CODE	st_NAME	st_marks
S100	CA	XYZ	90
S101	CB	PQR	70
S102	CB	ABC	55

		1. select min (st_marks) group by course_CODE;	
		2. select count (Student_ID) group by course_CODE having count (Student_ID)>1	
		3. select concat (Student_ID, course_CODE) AS details where st_marks>60;	
		4. SELECT * FROM student WHERE st_marks in (70,96);	
Q5 CO-3; SO-1; BL-3	1.	Consider schema R = (A, B, C, G, H, I) and the set F of functional dependencies {A → B, A → C, CG → H, CG → I, B → H}. Compute the candidate keys of the schema. Compute the closure of the same. Find the highest normal form satisfied by the given relation. Justify your answer.	[5M]
	2.	A. Write about differences between normalization and denormalization. B. Is the following relation in 2NF? Justify. If not, show the decomposed relation. {table below}	[4M+4M]
	3.	Elaborate on anomalies caused by duplicate date.	[4M]
	4.	Explain Armstrong's axioms	[3M]
Q6 CO-3; SO-1; BL-2	1.	What is a schedule? What is serial and concurrent schedule? Explain conflict serializability with example.	[6M]
	2.	Is the following schedule conflict and view serializable? Justify your answer. If its conflict serializable, can it be converted to serial schedule? S1: R1(A),R2(C),R1(C),R3(A),R3(B),W1(A),W3(B),R2(B),W2(C),W2(B).	[10M]
	3.	Discuss about ACID properties in DBMS.	[4M]
Q7 CO-1,2,4; SO-1,6; BL-1	1.	Write short notes on 1. Role of Database administrator 2. Write about select, project, union, set difference, cartesian product, rename in relational algebra with example 3. List some NOSQL databases and the applications where they are used. Explain how to retrieve documents using find() 4. Any 2 string and 2 date functions in SQL with syntax and an example.	[4M] [6M] [6M] [4M]

Table for Q5.2.B:

Customer_ID	Store_ID	Location
1	1	LA
1	3	SF
2	1	LA
3	2	NY
4	3	SF