



SVKM'S NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING/

SCHOOL OF TECHNOLOGY MANAGEMENT

Academic Year: 2023-2024

Program/s: MCA

Subject: Database Management System

Date: 5 / 12 / 2023

Marks: 10

Year: I Semester: I

Time: 3 hrs (10:00am to 1:00pm)

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 briefly:	[20]
CO- 1 BL-2	a.	Explain data abstraction in DBMS	5 M
CO- 3 BL-2	b.	Explain what is decomposition with example	5 M
CO- 2 BL-2	c.	Explain the following operations in relational algebra with examples (i) Projection and Selection (ii) Left Outer Join and Right outer Join	5 M
CO- 3 BL-2	d.	Explain ACID properties and various states of transactions	5 M
Q2 CO-1 BL-4	A	Company organized into DEPARTMENT. Each department has unique name and a particular employee who manages the department. Start date for the manager is recorded. Department may have several locations. A department controls a number of PROJECT. Projects have a unique name, number and a single location. Company's EMPLOYEE name, ssno, address, salary, sex and birth date are recorded. An employee is assigned to one department, but may work for several projects (not necessarily controlled by her dept). Number of hours/week an	10 M

		<p>employee works on each project is recorded; The immediate supervisor for the employee.</p> <p>Employee's DEPENDENT are tracked for health insurance purposes (dependent name, birthdate, relationship to employee).</p> <p>Draw an ER diagram for above scenario by assuming relevant constraints and attributes.</p>	
CO-3 BL-2	B	What do you understand by good Relational design? Discuss normalization.	10 M
Q3 CO-2; BL-3	A	<p>Faculty (FacultyID, FirstName, LastName, salary, DepartmentID)</p> <p>Department (DepartmentID, DepartmentName)</p> <p>Solve the following queries using SQL</p> <ol style="list-style-type: none"> Retrieve the department name and the count of Faculty members for departments with fewer than three Faculty members. List the Faculty members with a salary less than the average salary. List the name of the faculty having max salary from each department List the name of the faculty belongs to IT department List the name of department having < 3 Faculty 	10 M
CO-3 BL-2	B	<p>Discuss the difference between Second Normal Form and third with example. Find the highest level of Normal form or following given relation</p> <p>$R(ABCDEFGHI)$</p> <p>$FD = \{AB \rightarrow C, BD \rightarrow EF, AD \rightarrow GH, A \rightarrow I\}$</p>	10 M
Q4 CO-3 BL-2	A	Explain View Serializability with example	10 M
CO-2 BL-1	B	List all the aggregate functions and explain them with the help of an example	5 M
CO-3 BL-3	C	<p>$R(A B C D)$ has functional dependencies</p> <p>$F = (AB \rightarrow C, C \rightarrow D, D \rightarrow A)$.</p> <p>This relation is divided in to $R1 = (A, B, C)$; $R2 = (C, D)$.</p> <ol style="list-style-type: none"> List the number of keys Is dependency preserved for above functional dependencies? Explain. 	5 M

Q5 CO-1 BL-1	A	What is mapping cardinality? Explain all in detail with example. Show the steps to convert each mapping cardinality from ER model to Relational Model	10 M
CO-2 BL-2	B	Discuss the need of Join operation. Explain all types of Joins in DBMS with example	10 M
Q6 CO-2 BL-2	A	What are different types of keys in DBMS? Explain any 2	10 M
CO-1 BL-1	B	List advantages of DBMS over File System	5 M
CO-2 BL-2	C	Explain the concept of participation in DBMS with example	5 M
Q7 CO-4 BL-3	A	Demonstrate CRUD operation in MongoDB with example.	10 M
CO-2 BL-1	C	Define any 2 DML Command and give syntax for updating and deleting entry from table.	5 M
CO-1 BL-1	D	List different types of database users. Explain any 2 in detail	5 M