

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2025-2026		
B. Tech Program: BTech	Scheme III III	
Regular Examination: SY	Semester: IV	
Course Code: AIC403	and Course Name: Database Management Systems	
Date of Exam: 21/05/2026	Duration: 02.5 Hours	Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	What is view and how to create it? Can you update view? If yes, how? If not, why not?		CO4	U
b)	What is participation in terms of relation? Explain total and partial participation.		CO2	U
c)	Explain following relational algebra operators with example a) Selection operator b) Rename operator c) Union operator d) Cartesian product e) Projection operator.		CO3	U
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Consider following schema Student_fee_details (rollno, name, fee_deposited, date) Write a trigger to preserve old values of student fee details before updating in the table.		CO4	Ap
b)	Decomposition of R into R1, R2, R3, R(A,B,C,D,E,F); Functional Dependencies A→CD B→C F→DE F→A R1(A,B,C) R2(A,F,D) R3(E,F) Is this decomposition lossless or lossy?		CO5	Ap
c)	Verify the conflict serializability of given schedules R1(X); R3(X); W1(X); R2(X); W3(X) Draw the precedence graph and justify your answer.		CO6	Ap

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Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	A reputed general hospital has decided to computerize their operations. In the hospital many doctors are working. Personal information of doctors is maintained to get them fixed salary per month. The patients are admitted to the hospital into the room. They are treated by various doctors. Sometimes patients perform certain pathological tests which carried out into the labs. Identify the relationship among the entities along with the mapping cardinalities, keys in the E.R. diagram. Construct appropriate tables for E-R diagram designed with above requirements.		CO2	Ap
b)	Consider the following schema: Customer(Cust_id, Cust_name, City) Account(Acc_no, Type, Balance, Cust_id) Loan(Loan_no, Amount, Cust_id) Write relational algebra expressions for: a) Customers having both account and loan. b) Customers from Mumbai having balance greater than 50,000. c) Customers who do not have any loan. d) Customers having savings account. e) Customers having loan amount greater than 1,00,000.		CO3	Ap
c)	Consider the following schemas Emp(Emp_no, Emp_name, Dept_no) Dept(Dept_no, Dept_name) Address(Dept_name, Dept_location) Write SQL queries for the following i) Display the location of department where employee 'Ram' is working. ii) Create a view to store total no of employees working in each department in ascending order. iii) Find the name of the department in which no employee is working. iv) Display employee names along with their department names. v) Count the number of employees working in each department.		CO4	Ap
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	What is conflict serializability? How to check schedule is conflict serializable schedule. Give one example.		CO6	U
b)	What is functional dependency? Explain its use in database design. Consider the following schema. Student (RollNo, Branch_Code, Marks_Obtained, Exam_Name, Total_Marks)		CO4	U

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	Identify the functional dependencies and check whether the given schema is in 3NF or not. If not justify and convert the schema into 3NF.		
c)	Compare DBMS and File processing system in terms of data isolation, data redundancy, data inconsistency, data integrity	C01	U
