

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

May-June 2025		
B.Tech Program: AI-DS		Scheme III III
Regular Examination: SY		Semester: IV
Course Code: AIC402 and Course Name: Database Management Systems		
Date of Exam: 21/05/25	Duration: 2.5 Hours	Max. Marks: 60

Instructions:

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

		Max. Marks	CO	BT level																		
Q 1	Solve any two questions out of three: (05 marks each)	10																				
i)	Explain ACID properties of a transaction	5	6	U																		
ii)	Define with an example different types of Entities in ER diagram.	5	2	U																		
iii)	Explain any five relational algebra operators with suitable example.	5	3	U																		
Q.2	Solve any two questions out of three: (05 marks each)	10																				
i)	Write SQL queries for the given database Book(book_id, title, author, cost) Store(store_no, city, state, inventory_val) Stock(store_no, book_id, quantity) i) Modify the cost of DBMS books by 10%. ii) Find the total number of books in Mumbai stores. iii) Find the title of all books whose title contains the word 'system'. iv) Find title of the most expensive book. v) Add a new record in book. (Assume values as per requirement)	5	4	AP																		
ii)	Explain grant and revoke command with syntax and example.	5	4	U																		
iii)	State whether following table is conflict serializable with Justification. <table><tr><td>T1</td><td>T2</td></tr><tr><td>Read(A)</td><td></td></tr><tr><td>Write(A)</td><td></td></tr><tr><td></td><td>Read(A)</td></tr><tr><td></td><td>Write(A)</td></tr><tr><td>Read(B)</td><td></td></tr><tr><td>Write(B)</td><td></td></tr><tr><td></td><td>Read(B)</td></tr><tr><td></td><td>Write(B)</td></tr></table>	T1	T2	Read(A)		Write(A)			Read(A)		Write(A)	Read(B)		Write(B)			Read(B)		Write(B)	5	6	AP
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Q.3	Solve any two questions out of three. (10 marks each)	20		
i)	Explain overall architecture of DBMS in detail with an appropriate diagram.	10	1	U
ii)	Draw ER diagram of Bank database with 4 entities, 4 attributes for each entity. Specify cardinality ratio for each relationship between entities	10	2	Ap
iii)	Write down Relational Algebra queries of the following statement. i) Find all customers who have an account at all branches located at 'Brooklyn' city. ii) Selecting tuples from the novels wherever the subject happens to be 'information' and the price is 150. iii) Projecting the names of those writers who might have written either an article or a novel or both. iv) Find the name of all players who played their first test after 2000. v) To select all students who received an 'A' in DBMS.	10	3	Ap
Q.4	Solve any two questions out of three. (10 marks each)	20		
i)	Write a SQL query to retrieve the total salary of the employees in each department of a company, where the total salary of each department falls between 2000 and 6000 and the department field is not null? Use necessary data wherever needed.	10	4	Ap
ii)	What is normalization? Explain 1NF, 2NF, 3NF with suitable examples.	10	5	U
iii)	What is Deadlock? Give deadlock prevention and detection with suitable example.	10	6	U
