

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

May-June 2024

(B.Tech) Program: Computer Engineering Scheme :II -B

~~Supplementary Regular~~ Examination: SY Semester: IV

Course Code: CEC403 and Course Name: Database Management System

Date of Exam: 30/7/24

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.

		Max. Marks	CO	BT level
Q.1	Solve any six questions out of eight:	12		
i)	Explain PROJECTION and SELECT relational algebra operators with one suitable query.	2	CO3	U
ii)	Write transaction control commands and its use with example.	2	CO6	U
iii)	Define trigger with example	2	CO4	U
iv)	Explain the mapping of strong and weak entity from ER to relational schema with one example.	2	CO3	U
v)	Explain partial dependency with example.	2	CO5	U
vi)	Explain Dirty read problem in transactions with example	2	CO6	U
vii)	Define Multivalued attribute, derived attribute, draw notation with example.	2	CO2	U
viii)	Explain with example, Characteristics of DBMS.	2	CO1	U
Q.2	Solve any four questions out of six.	16		
i)	Consider given relation R(A, B,C,D,E,F) having set of FD's: $A \rightarrow B$, $A \rightarrow C$, $C \rightarrow D$, $B \rightarrow E$, $AC \rightarrow F$ Calculate attribute closures $\{A\}^+$, $\{B\}^+$ and $\{AC\}^+$ along with all possible candidate keys	4	CO5	Ap
ii)	Explain Views in DBMS with suitable examples. Write benefits of creating views.	4	CO4	U
iii)	Draw an ER diagram for many Employees works on many projects and Many Project controls by the department. Specify Cardinality, total, partial participation, types of attributes etc. Employee works on a project for specific number of hours.	4	CO2	Ap

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iv)	<pre> graph TD ACCOUNT[ACCOUNT] --- ISA{ISA} ISA --- CHECKING[CHECKING-ACCOUNT] ISA --- SAVINGS[SAVINGS-ACCOUNT] ACCOUNT --- Acc_No((Acc_No)) ACCOUNT --- Balance((Balance)) CHECKING --- Overdraft((Overdraft_Amount)) SAVINGS --- Interest((Interest_Rate)) </pre> <p>Convert above specialization into relational schema using mapping rules. i) Multiple relations – superclass & subclass ii) Multiple relations-subclass relations only</p>	4	CO3	Ap
v)	Check whether the given schedule S is conflict serializable or not- S : R1(A) , R2(A) , R1(B) , R2(B) , R3(B) , W1(A) , W2(B)	4	CO6	Ap
vi)	Student (S_id, Name, Subject, Dob) Course (c_id, cname, Dept) Enroll (S_id, c_id, semester , grade) Write relational algebra queries i) Find all student names registered for course_id is 15 (02M) ii) Find all student details belonging to Compute dept. (02M)	4	CO3	Ap
Q.3	Solve any two questions out of three.	16		
i)	Define 2NF normal form with example. Which dependency should be fulfilled in 2NF. (4 M) Define BCNF, why it is called more strict normal form. Give suitable example. (4 M)	8	CO5	U
ii)	Explain Super key, primary key, candidate key. (3 M) Give suitable example. Explain mapping of ER model considering 1:1, 1:M, M:1, M:N into relational model with example.(5 M)	8	CO3	U
iii)	Draw an EER diagram for Library management system, Students and faculties are members who issue and return the books on particular date. Four books can issue on a day. Books have title, author, publication, price	8	CO2	Ap

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	and number of books. Members pay fine if return date is exceeding the due date. ER diagram should include · Different types of attributes · Relations · Cardinality Constraint · Participation Constraint · Specialization/Generalization.			
Q.4	Solve any two questions out of three.	16		
i)	Draw detailed DBMS system architecture (4M). Explain each component in detail. (4M)	8	CO1	U
ii)	Write SQL queries for Employee (eid, ename, street, salary) Works (eid, cid, salary, date_join) Company (cid, cname, city) i) To create all tables with primary key and referential integrity constraints. (4M) ii) To find the name of the employee whose salary is maximum. (1M) iii) Display salary in descending order for all employees. (1M) iv) Find all employee details who joined in the month of June. (2 M)	8	CO4	Ap
iii)	Explain 2 phase locking protocol 2PL with examples. (4M) Write advantages and disadvantages of 2PL (4M)	8	CO6	U
