

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

August 2023 (Supplementary Exam)
(B.Tech) Program: Computer Engineering Scheme: II
Examination: SY Semester: IV
Course Code: CEC403 and Course Name: Database Management System

Date of Exam: 28/8/23

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 six questions out of eight:	12		
i)	Define data abstraction with example.	02	CO1	U
ii)	Draw a transaction state diagram with proper labeling.	02	CO6	U
iii)	What is strong and weak entity with example?	02	CO2	U
iv)	What is a full functional dependency (FFD) with example?	02	CO5	U
v)	Define with example the projection operation used in relational algebra.	02	CO3	U
vi)	What are the different types of transaction failures?	02	CO6	U
vii)	Explain CHECK constraint with example?	02	CO4	U
viii)	Define any four aggregate operations in relational algebra?	02	CO3	U
Q2	Solve any four questions out of six.	16		
i)	Illustrate in detail with example: a) Specialization with Disjoint constraint b) Specialization with Overlapping constraint	04	CO2	U
ii)	Explain with example, applications of database in various domains?	04	CO1	U
iii)	What is a serial schedule and serializability in concurrency control?	04	CO6	U
iv)	Explain 2NF and 3NF with example?	04	CO5	U
v)	Explain any one log based recovery technique with example	04	CO6	U
vi)	Explain DCL and TCL commands in SQL with examples	04	CO4	U
Q.3	Solve any two questions out of three.	16		

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i)	<p>Explain with example conflict and view serializability.</p> <p>Consider the following schedule for the transactions T1, T2, T3 and T4: Check whether the given schedule S is conflict serializable and recoverable or not-</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>T1</th> <th>T2</th> <th>T3</th> <th>T4</th> </tr> </thead> <tbody> <tr> <td></td> <td>R(X)</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>W(X)</td> <td></td> </tr> <tr> <td></td> <td></td> <td>Commit</td> <td></td> </tr> <tr> <td>W(X)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Commit</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>W(Y)</td> <td></td> <td></td> </tr> <tr> <td></td> <td>R(Z)</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Commit</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>R(X)</td> </tr> <tr> <td></td> <td></td> <td></td> <td>R(Y)</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Commit</td> </tr> </tbody> </table>	T1	T2	T3	T4		R(X)					W(X)				Commit		W(X)				Commit					W(Y)				R(Z)				Commit						R(X)				R(Y)				Commit	8	CO6	Ap
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ii)	<p>Write SQL query for the given Database:</p> <p>Employee(<u>Eid</u>, Ename, street, city) Works (<u>Eid</u>, <u>Cid</u>, salary) Company (<u>Cid</u>, Cname, city)</p> <p>a. Modify the database so that John now live in 'Chennai'. (02M) b. Give all employees of 'XYZ Corporation' a 10% raise in salary. (02M) c. Find all Employees name whose average salary is more than 50000 and who are working for the same company. (02M) d. Find all the employees who are working for the company name starting with "A" (02M)</p>	8	CO4	Ap																																																
iii)	<p>Explain following features of Extended ER Diagram with example</p> <p>a) Generalization/ Specialization b) Aggregation</p>	8	CO2	U																																																
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i)	Suppose a relational schema R (A, B, C, D, E) and set of functional dependencies: FD's: { A-> B, B->E, C->D } Check out that relation is in 1NF, 2NF and 3NF or not? If not decompose it.	8	CO5	Ap
ii)	Illustrate mapping rules for converting following ER Diagram to relational schema: 	8	CO3	Ap
iii)	What is 2PL? Explain 2PL (2-Phase) locking protocol with its types.	8	CO6	U
