



Tagline: "Saghi, Swasth, Sukt" (Saghi, Swasth, Sukt)

THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY

Autonomous College Affiliated to University of Mumbai

Approved by All India Council for Technical Education (AICTE) and Government of Maharashtra (GoM)

Conferred Autonomous Status by University Grants Commission (UGC) for 10 years w.e.f. A.Y. 2019-20

Among Top 230 Colleges in the Country where NIRF India Ranking 2020 in Engineering College category

ISO 9001:2015, 14001:2015, ISO 45001:2018 Certified • Programmes Accredited by National Board of Accreditation (NBA), New Delhi

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Website : www.tcetmumbai.in

END SEMESTER EXAMINATION, DEC 2024 S.E. SEMESTER III (CBCGS-HME 2023)

02 DEC 2024

Branch:	COMP	Q.P. Code:	ED243CER551-2
Subject:	Database Management System	Duration:	2 hours
Subject Code:	PCC- CS301	Max. Marks:	60

- Instructions:
1. All sections are compulsory
 2. Figures to the right indicate full marks.
 3. Assume suitable data if necessary and state the assumptions clearly.

Section-I		Short Answer Questions (Answer any 05 questions out of 06) (Fundamental, Core Types)				(10 Marks)	
Q. No.		Marks	CO	RBT Level	PI		
1	Explain the timestamp ordering protocol and how it ensures concurrency control without relying on locks.	2	6	U	1.4.1		
2	Define multivalued dependency and examine its relationship with the normalization process.	2	5	R	1.4.1		
3	What role do joins play in combining data from multiple tables, and why are they essential for relational database queries?	2	4	A	2.4.1		
4	Differentiate between the DELETE and DROP commands in SQL. How do these commands affect database tables and records?	2	3	U	2.5.2		
5	Describe the purpose of a Composite Attribute and provide an example. How do composite attributes enhance the representation of data in the ER Model?	2	2	U	2.5.2		
6	What are the primary advantages of using a Database Management System (DBMS) over a traditional File Processing System? How does a DBMS improve data management?	2	1	R	1.7.1		
Section-II		Descriptive Answer Questions (Answer any 04 out of 06) (Descriptive, Comprehension Types)				(20 Marks)	
1	Describe the process of using shadow paging to recover a database after a failure. Highlight the steps involved in this recovery method.	5	6	A	2.4.1		
2	Discuss the role of functional dependency diagrams in normalization. How can inaccuracies in these diagrams lead to design flaws?	5	5	A	2.3.1		
3	Consider the following scenario that after a departmental restructure, several users no longer require access to certain databases. Elaborate the process.	5	4	A	1.4.1		
4	Explain the importance of transaction management in a database system. Discuss the roles of COMMIT, ROLLBACK, and SAVEPOINT commands in ensuring data consistency and integrity.	5	3	U	2.5.2		



Laxmi Singh Desai's Trust's (a54yd.)

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5	Explain the concept of Aggregation in the EER Model and provide an example of its application. How does aggregation simplify complex relationships?	5	2	U	2.5.2
6	Describe the roles and responsibilities of a Database Administrator (DBA). How does the DBA ensure the effective management and security of the database system?	5	1	U	2.5.2
Section-III Long Answer Question (Answer any 03 out of 05) (Application, Analytical, Evaluation, Design Type)					(30 Marks)
1	Discuss various concurrency control mechanisms and explain how they are designed to prevent deadlocks in a database environment. Provide examples to illustrate their effectiveness.	10	6	U	1.4.1
2	Propose a comprehensive normalization strategy given a sample database schema with design flaws, detailing each step from 1NF to 4NF with justifications.	10	5	C	2.4.4
3	In what ways could the reliance on referential integrity mechanisms lead to unforeseen issues in database management, particularly in complex environments where data sources are external, distributed, or when legacy data migration is involved? Provide examples of potential pitfalls.	10	4	A	2.3.1
4	Write SQL queries for the following table structure: EMP(empno, deptno, ename, salary, designation, joiningdate, DOB, city)	10	3	A	2.8.1
5	Draw an ER diagram to represent entities like Books, Members, and Loans with their relationships. Convert the ER diagram to an EER diagram by adding subclasses for different types of members (e.g., Student, Faculty).	10	2	A	2.8.1