THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY

Estd 2001

IN-SEMESTER EXAMINATION-I

S.E. (Semester-III)

SUBJECT – DATABASE MANAGEMENT SYSTEMS

Branch: IT
Div.: ALL
Duration: 60 Minutes

Date: 29/08/2024
Timing: 10:00 AM to 11:00 AM
Maximum Marks: 20

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams / sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

ISE-1 2023

ESE 2023

Q.1		Answer any 5 of the following questions	Marks	Course Outcomes	Learning Levels
	a.	Discuss and exemplify four real-time applications of a DBMS.	2	1	C
	b.	Infer data redundancy and explain why it's a concern in database design.	2	1	R
	c.	List two categories of users in a database system and give an example for each.	2	1	R
	d.	Define Multi-valued attribute. Give an example.	2	2	R
	e.	Describe Super Key. Give an example.	2	2	R
	f.	Define the term "foreign key" and explain its role in establishing relationships between tables in a database.	2	3	R
	g.	Discuss the purpose of the "natural join" operation in relational algebra and how it is used to combine related tuples from different relations.	2	3	U
Q.2	a.	Clarify the idea of aggregation. Give two examples of where this concept is useful.	5	2	R
		OR			
	b.	Explain the four types of mapping cardinality with example?	5	2	U
Q.3	a.	Illustrate the concept of primary key and foreign key with an example. Consider two tables, Library and Book, and show how these keys are used.	5	3	AN
		OR			
	b.	Describe the concept of inner join, left outer join, and right outer join in SQL with appropriate examples using the Employee and Department tables.	5	3	AN

IN-SEMESTER EXAMINATION-II

S.E. (Semester-III)

SUBJECT – DATABASE MANAGEMENT SYSTEM

Branch: IT
Div.: ALL
Duration: 60 Minutes

Date: 19/10/2024
Timing: 10:00 AM to 11:00 AM
Maximum Marks: 20

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams / sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

Q.1		Answer any 5 of the following questions	Marks	Course Outcomes	Learning Levels
	a.	Recall the concept of triggers in DBMS and describe their key functionalities. How are they typically used to automate tasks within a database system?	2	4	R
	b.	Describe the concept of a database view and explain how it differs from a table. What are the implications of these differences for data management?	2	4	U
	c.	What is insertion anomaly? Describe it with example.	2	5	AN
ISE-2	d.	Why is database normalization required?	2	5	U
	e.	Define transaction and list the key properties required for ACID compliance in database systems.	2	6	R
	f.	Clarify the purpose of checkpoints in a recovery system and describe how they help reduce recovery time after a failure.	2	6	U
	g.	Summarize the difference between serial schedule and concurrent schedule in databases.	2	6	U
Q.2	a.	Compare and contrast the concepts of a view and a table in a database. Discuss situations where using views is preferable with suitable example.	5	4	AN
		OR			
	b.	Analyze the security issues associated with storing critical data, such as User ID and Password, in plain text within a login table. Discuss the essential security measures that should be implemented to protect this sensitive information.	5	4	AN
Q.3	a.	Explain what is meant by repetition of information and inability to represent information. Discuss in terms of various anomalies.	5	5	U
		OR			
	b.	Compare and contrast 1 NF with 2 NF with suitable example.	5	5	AN

Website : www.tcetmumbai.in
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
Amongst Top 200 Colleges in the Country, Ranked 191st in NIRF India Ranking 2019 in Engineering College category
Estd. in 2001

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

Branch:	**IT**	**Q.P. Code:**	**ED243ITR5S5-1**
Subject:	**Database Management System**	**Duration:**	**2 hours**
Subject Code:	**PCC-IT 302**	**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)** **(10 Marks)**
(Fundamental, Core Types)

Q. No.		Marks	CO	RBT Level	PI
1	Identify the challenges associated with managing data without a structured database system and provide examples to illustrate these challenges.	2	1	U	1.6.1
2	Differentiate between the concepts of candidate key and super key in a relational database.	2	2	R	2.5.2
3	Consider the relation Department (DeptId, DeptName, Location). Write the relational algebra expression to display departments located in 'Kandivali'.	2	3	A	2.5.2
4	Recall the concept of triggers in DBMS and describe their key functionalities. How are they typically used to automate tasks within a database system?	2	4	R	1.7.1
5	Explain the update anomaly with suitable example.	2	5	R	3.6.1
6	Define ACID properties in database transactions and briefly describe each property.	2	6	U	2.5.2

Section-II **Descriptive Answer Questions (Answer any 04 out of 06)** **(20 Marks)**
(Descriptive, Comprehension Types)

1	Consider the IRCTC railway ticket booking system. Identify the types of database user for the given application and explain each in brief.	5	1	U	1.6.1
2	Construct entity relationship diagram to demonstrate Generalization, consider suitable example.	5	2	A	3.6.1
3	Illustrate the concept of primary key and foreign key with an example. Consider two tables, Library and Book, and show how these keys are used.	5	3	A	2.5.1
4	Apply the concept of views to enforce security in a DBMS by limiting user access to specific data. Illustrate this with a detailed example, including the syntax for creating and using the view in a secure environment.	5	4	A	1.6.1
5	Compare 3 NF and BCNF with suitable example.	5	5	AN	2.6.2
6	Describe the idea behind deadlock handling strategies and differentiate between deadlock prevention and deadlock avoidance.	5	6	U	3.6.1

Section-III	Long Answer Question (Answer any 03 out of 05) (Application, Analytical, Evaluation, Design Type)				(30 Marks)
1	Design an Entity-Relationship (E-R) diagram for a Library Management System with the following requirements: • The library has multiple books. • Each book has a title, author, ISBN number, and publication year. • Each book belongs to a specific genre. • The library also has members who borrow books. • Each member has a member ID, name, and contact information. • Each loan record includes a loan ID, book, member, loan date, and return date. Create a detailed E-R diagram using Chen notation. List your assumptions and clearly indicate the cardinality mappings and role indicators in your diagram.	10	2	A	3.7.2
2	Imagine we are working with a university database. The database has the following relations: Department (dept_name, dept_location, budget) Course (course_id, dept_name, course_name, credits) Student (student_id, student_name, student_address, major_dept) Enrollment (student_id, course_id, semester) Professor (professor_id, professor_name, dept_name, salary) Teaches (professor_id, course_id, semester) a. Find the highest budget of any department b. Find the names of all students who are enrolled in a course, along with the course ID and semester c. Find all students who are enrolled in at least one course and have a major in a department that offers that course d. Find all students who are enrolled in courses taught by professors in the "Computer Science" department.	10	3	A	3.6.1
3	Evaluate the suitability of Full and Incremental backup types for a database containing critical financial data. Justify your choice by analyzing the strengths and weaknesses of each backup type in terms of data security, recovery time, and storage requirements.	10	4	AN	2.6.5
4	Consider universal relation R = {A, B, C, D, E, F, G, H, I} and set of functional dependencies are {AB→C, A→ DE, B→F, F→GH, D→IJ} a. Choose correct key for 'R'. b. Decompose 'R' into 2 NF and then 3 NF	10	5	E	2.7.2
5	Describe deadlock. Explain dead lock handling techniques with appropriate examples.	10	6	U	2.5.2