Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 28-05-2025 **Time:** 01:00 pm – 04:00 pm

School: SOCSE	**Program**: B. Tech- CBC/CCS/CDV/CIT/CSD/CSI/CSN/ISE /IST/CBD	
Course Code: CSE3156	**Course Name:** Database Management Systems	
Semester: IV	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**26**	**26**	**24**	**24**	**-**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.				**10Q x 2M=20M**
1.	List the limitations of DBMS.	**2 Marks**	**L1**	**CO1**
2.	List the major functions performed by DBA.	**2 Marks**	**L1**	**CO1**
3.	Differentiate between weak entity and strong entity.	**2 Marks**	**L1**	**CO1**
4.	Explain various Data types used in SQL.	**2 Marks**	**L2**	**CO2**
5.	What is nested query in SQL? Explain with a suitable SQL query.	**2 Marks**	**L2**	**CO2**
6.	Explain ON DELETE CASCADE constraint with suitable SQL query.	**2 Marks**	**L2**	**CO2**
7.	Explain super key and candidate key.	**2 Marks**	**L2**	**CO3**
8.	Define Functional Dependency.	**2 Marks**	**L1**	**CO3**
9.	Define the concept of a database transaction with an example.	**2 Marks**	**L1**	**CO4**
10.	Explain briefly the meaning of serializability of transactions.	**2 Marks**	**L2**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

<table>
<tr><td>11.</td><td>a.</td><td>Explain the different types of DBMS users.</td><td>5 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td></td><td>b.</td><td>Define the terms: Database schema and Database state.</td><td>5 Marks</td><td>L1</td><td>CO1</td></tr>
<tr><td></td><td>c.</td><td>Explain in detail the components of DBMS environment with a block diagram.</td><td>10 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>12.</td><td>a.</td><td>List and explain various types of entity attributes with suitable examples.</td><td>5 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td></td><td>b.</td><td>Construct E-R diagram of the bank. It provides different kinds of bank accounts. And loans. It operates number of branches.</td><td>5 Marks</td><td>L2</td><td>CO1</td></tr>
<tr><td></td><td>c.</td><td>Consider the following relations
EMPLOYEE
<table><tr><th>ENO</th><th>NAME</th><th>DOB</th><th>GENDER</th><th>DCODE</th></tr><tr><td>12345</td><td>HAMEN</td><td>24-MAR-2001</td><td>M</td><td>201</td></tr><tr><td>12346</td><td>VINI</td><td>12-MAR-2001</td><td>F</td><td>202</td></tr><tr><td>12347</td><td>ANI</td><td>11-JAN-1999</td><td>F</td><td></td></tr><tr><td>12348</td><td>PETER</td><td>14-FEB-2001</td><td>M</td><td></td></tr></table>DEPARTMENT
<table><tr><th>DCODE</th><th>DNAME</th></tr><tr><td>201</td><td>COMPUTER SC</td></tr><tr><td>202</td><td>INFN SC</td></tr><tr><td>203</td><td>CIVIL</td></tr><tr><td>204</td><td>MECHANICAL</td></tr></table>The primary key of each relation is underlined. Outline Cartesian product, equi-join, left outer join, right outer join and full outer join operations in relational algebra. Apply the above relational algebra operations with the EMPLOYEE and DEPARTMENT relations.</td><td>10 Marks</td><td>L3</td><td>CO1</td></tr>
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<tr><td>13.</td><td>a.</td><td>What is a View? How can it be created and dropped? Also explain the problems associated with view update. Demonstrate with simple SQL queries.</td><td>5 Marks</td><td>L3</td><td>CO2</td></tr>
<tr><td></td><td>b.</td><td>Explain the following SQL commands/Keywords:
i. DISTINCT
ii. EXISTS
iii. LIKE</td><td>5 Marks</td><td>L2</td><td>CO2</td></tr>
<tr><td></td><td>c.</td><td>Apply the following relations for a company database Application.</td><td>10 Marks</td><td>L3</td><td>CO2</td></tr>
</table>

		EMPLOYEE (ENO, ENAME, SEX, DOB, DOJ, BASIC_PAY, DEPTNO) DEPARTMENT (DEPTNO, DNAME) PROJECT (PROJNO, PNAME, DEPTNO) WORKS_ON (ENO, PROJNO, HOURS) i. Calculate the numbers of male and female employees. ii. List the names of employees who are working for CSE department. iii. Count the number of employees who are working on JAVA project. iv. List the employees who are not working on any projects. v. Create a view to show the names of all the employees along with their department names.			
		Or			
14.	**a.**	What is a Database Trigger? Apply and create a simple UPDATE trigger using SQL on a table EMPLOYEE.	5 Marks	**L3**	**CO2**
	b.	What is a stored procedure? Apply and create a stored procedure to add two numbers and print the result.	5 Marks	**L3**	**CO2**
	c.	**Consider and apply the relation schema given below:** EMPLOYEE (EMPNO, NAME, OFFICE, AGE) BOOK (ISBN, TITLE, AUTHOR, PUBLISHER) LOAN (EMPNO, ISBN, DATE) **Implement the SQL queries for the following requirements.** i. Find the names of employees who have borrowed a book published by McGraw-Hill. ii. List the names of the employees who have not borrowed any books. iii. List the names of the employees who have borrowed more than two books. iv. Retrieve the total number of books present in the library. v. Generate a report containing EMPNO, NAME, ISBN, AUTHOR, PUBLISHER, and BORROWED DATE.	10 Marks	**L3**	**CO2**

15.	**a.**	Explain the informal design guidelines used in relational schema design.	5 Marks	**L2**	**CO3**
	b.	What is a multivalued dependency? How is it different from a functional dependency? Explain with an example.	5 Marks	**L2**	**CO3**
	c.	Explain Boyce-Codd Normal Form (BCNF). How does it different from 3NF? Explain with an example.	10 Marks	**L2**	**CO3**
		Or			
16.	**a.**	Explain the Armstrong's Rules of Inference.	5 Marks	**L2**	**CO3**
	b.	What is a lossless decomposition? Explain with an example.	5 Marks	**L2**	**CO3**

	c.	What is normalization? Explain 1NF, 2NF and 3NF with real world examples.	10 Marks	**L2**	**CO3**

17.	**a.**	Explain the different states of a transaction in detail with the help of a well-labeled state diagram.	5 Marks	**L2**	**CO4**
	b.	Explain the concept of concurrency control in transaction management. Analyze why it is essential in muti-user database environment?	5 Marks	**L2**	**CO4**
	c.	What is 2PL? List and explain the different variations of 2PL. How does 2PL guarantee serializability? Explain with an example.	10 Marks	**L2**	**CO4**
Or					
18.	**a.**	List and explain the ACID properties of a database transaction.	5 Marks	**L1**	**CO4**
	b.	Explain Timestamp ordering algorithm.	5 Marks	**L2**	**CO4**
	c.	Explain in detail the ARIES recovery method.	10 Marks	**L2**	**CO4**