SRM Institute of Science and Technology
College of Engineering and Technology
School of Computing
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: 2023-24 (EVEN) SET – 4(BATCH 2)

ANSWER KEY

Test: CLA-T1 **Date: 09-02-2024**
Course Code & Title: 18CSC303J Database Management Systems **Duration:** 50 Minutes
Year & Sem: III Year / VI Sem **Max. Marks:** 25

Course Articulation Matrix:

S. No.	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSC
1	CO1	3	2	2	-	-	-	-	-	-	-	-	-	2	2	-
2	CO2	3	2	2	-	-	-	-	-	-	-	-	-	2	2	-
3	CO3	3	3	3	-	-	-	-	-	-	-	-	-	2	2	-
4	CO4	3	3	3	2	-	-	-	-	-	-	-	-	2	2	-
5	CO5	3	2	2	-	-	-	-	-	-	-	-	-	2	2	-

Part - A
(10 x 1 = 10 Marks)

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	Which of the following is NOT a component of a typical DBMS architecture? a) Query Processor b) Database Administrator **c) Data Warehouse** d) Data Storage Manager **Answer: C**	**1**	**L1**	**1**	**1**	**1.6.1**
2	Which of the following is an advantage of using a DBMS over traditional file systems? a) Increased data redundancy **b) Improved data integrity** c) Limited query capabilities d) Simplified data storage **Answer: B**	**1**	**L2**	**1**	**1**	**1.7.1**
3	What is the purpose of a Database Administrator (DBA) in a DBMS? **a) To design and implement the database schema** b) To optimize SQL queries for performance **c) To manage user access and permissions** d) To interact with users and perform data analysis **Answer: a & c**	**1**	**L1**	**1**	**1**	**1.7.1**
4	Which of the following is NOT a property of ACID in database transactions? **a) Accuracy** b) Atomicity c) Consistency d) Durability **Answer:a**	**1**	**L1**	**1**	**1**	**1.6.1**
5	Which data model represents data in a tree-like structure with a single root and multiple children?	**1**	**L1**	**1**	**1**	**1.7.1**

	a) Relational Data Model **b) Hierarchical Data Model** c) Network Data Model d) Entity-Relationship Model **Answer: b**					
6	Which of the following is an example of a relational database management system? a) MongoDB **b) Oracle Database** c) Redis d) Cassandra **Answer: b**	**1**	**L1**	**1**	**1**	**1.6.1**
7	Existence of business logic in a) Two-tier architecture **b) Three-tier architecture** c) Both a and b d) Client-server machine **Answer: b**	**1**	**L1**	**1**	**1**	**1.6.1**
8	In DDL, which statement is used to define constraints on a table? a) Create constraint **b) Add constraint** c) Set constraint d) Enforce constraint **Answer: b**	**1**	**L1**	**1**	**1**	**1.7.1**
9	Which of the following is NOT a type of relationship constraint in the ER model? a) Cardinality b) Participation c) Key **d) Degree** **Answer: d**	**1**	**L2**	**1**	**1**	**1.7.1**
10	One department account (C) is debited and another department account (D) is credited, either both the credit and debit should occur, or that neither should occur is an example of _________. a) Durability b) Consistency **c) Atomicity** d) Integrity **Answer: c**	**1**	**L1**	**1**	**1**	**1.6.1**
PART B(1 X 7.5 = 7.5)						
11.a	List the components of Storage Manager and Query processor and explain them In a Database Management System (DBMS), the Storage Manager and Query Processor are two essential components responsible for managing data storage and handling queries, respectively. Storage Manager Components: 1. Data Files: - Description: Physical storage on disk where the actual data is stored. - Function: Organizes and stores data in a structured format,	**7.5**	**L2**	**1**	**1**	**1.7.1**

	usually in tables. 2. Buffer Manager: - Description: Manages a buffer pool in memory for frequently accessed data. - Function: Minimizes disk I/O operations by keeping frequently used data in memory, improving overall system performance. 3. File Organization Module: - Description: Determines how data is organized and stored within data files. - Function: Defines the structure of data storage, such as indexing, sorting, and clustering, to optimize retrieval and storage efficiency. 4. Disk Space Manager: - Description: Manages the allocation and deallocation of space on disk for data storage. - Function: Ensures efficient utilization of disk space and handles tasks like space allocation, deallocation, and file expansion. 5. Storage Interface: - Description: Provides an interface for interaction between the DBMS and the operating system's file system. - Function: Manages communication and data transfer between the DBMS and the physical storage layer. Query Processor Components: 1. Query Parser: - Description: Analyzes and validates the syntax of SQL queries. - Function: Breaks down queries into components and checks their syntax, ensuring they conform to the language rules. 2. Query Optimizer: - Description:Determines the most efficient way to execute a query. - Function: Analyzes various execution plans and selects the one with the least cost, optimizing query performance. 3. Query Executor: - Description: Executes the optimized query plan generated by the query optimizer. - Function:Coordinates the retrieval and manipulation of data based on the optimized plan, interacting with the Storage					

	Manager to access and modify data. 4. Transaction Manager: - Description: Ensures the consistency and integrity of transactions. - Function: Manages the execution of transactions, including the beginning, committing, or rolling back of transactions to maintain the database's integrity. 5. Concurrency Control Manager: - Description: Handles simultaneous access to the database by multiple transactions. - Function: Enforces isolation among transactions to prevent interference and conflicts, ensuring consistency and correctness. 6. Database Scheduler: - Description: Coordinates the execution of various tasks and transactions. - Function: Manages the scheduling of concurrent tasks and transactions to optimize resource utilization and maintain system efficiency. Both the Storage Manager and Query Processor work together to ensure the efficient storage, retrieval, and manipulation of data within a database system. Their coordination is crucial for maintaining the integrity, security, and performance of the database.					
	OR					
11.b	Describe in detail about Relational Data model and design the relational data model for online movie ticket system. Relational Data Model: The relational data model is a database model based on the mathematical concept of a relation, which is essentially a table with rows and columns. In this model, data is organized into tables, and relationships between tables are established using keys. The primary components of the relational data model include: 1. Table (Relation): - Represents an entity, and each row in the table represents an instance of that entity. - Columns in the table represent attributes or properties of the entity. - Each table has a unique name.	**7.5**	**L3**	**1**	**1**	**1.7.1**

	2. Attribute (Field): - Represents a property or characteristic of an entity. - Corresponds to a column in a table. 3. Tuple (Row): - Represents a single instance or record in a table. - Contains values for each attribute defined in the table. 4. Key: - Uniquely identifies a tuple within a table. - Primary key: A unique identifier for each tuple in a table. - Foreign key: A field in one table that refers to the primary key of another table, establishing a relationship. 5. Relationship: - Defines connections between tables using keys. - Common types include one-to-one, one-to-many, and many-to-many relationships. Relational Data Model for an Online Movie Ticket System: Let's design a simplified relational data model for an Online Movie Ticket System. We'll consider entities such as Movies, Cinemas, Users, and Bookings. 1. Movies Table: - Attributes: MovieID (Primary Key), Title, Genre, ReleaseDate, Duration. 2. Cinemas Table: - Attributes: CinemaID (Primary Key), Name, Location, Capacity. 3. Users Table: - Attributes: UserID (Primary Key), FirstName, LastName, Email, Password. 4. Bookings Table: - Attributes: BookingID (Primary Key), UserID (Foreign Key), MovieID (Foreign Key), CinemaID (Foreign Key), Date, Time, TotalAmount. - Explanation: - The `Movies` and `Cinemas` tables store information about movies and cinema locations. - The `Users` table contains details about the users of the					

system.

- The `Bookings` table is the central table, linking users, movies, and cinemas through foreign keys. It stores booking information, including the date, time, and total amount.

Example SQL Schema:

```
CREATE TABLE Movies (
    MovieID INT PRIMARY KEY,
    Title VARCHAR(255),
    Genre VARCHAR(50),
    ReleaseDate DATE,
    Duration INT
);

CREATE TABLE Cinemas (
    CinemaID INT PRIMARY KEY,
    Name VARCHAR(100),
    Location VARCHAR(255),
    Capacity INT
);

CREATE TABLE Users (
    UserID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    Email VARCHAR(255),
    Password VARCHAR(50)
);

CREATE TABLE Bookings (
    BookingID INT PRIMARY KEY,
    UserID INT,
    MovieID INT,
```

~~~
    CinemaID INT,

    Date DATE,

    Time TIME,

    TotalAmount DECIMAL(10, 2),

    FOREIGN KEY (UserID) REFERENCES Users(UserID),

    FOREIGN KEY (MovieID) REFERENCES Movies(MovieID),

    FOREIGN KEY (CinemaID) REFERENCES Cinemas(CinemaID)

);
```
~~~

This schema represents a basic structure for an Online Movie Ticket System, providing the foundation for managing movies, cinemas, users, and bookings. Additional considerations, such as seats, payment details, and real-world constraints, would be essential for a fully functional system.

PART C(1 X 7.5 = 7.5)

12		**7.5**	**L3**	**1**	**2**	**2.6.3**

Emp Id	**Emp Name**	**Emp Age**	**Emp Address**	**Emp Salary**
101	Ganesh	25	Chennai	45000
102	Rajesh	21	Trichy	75000
103	Pradeep	28	Madurai	65000
104	Murugan	30	Madurai	15000
105	Velu	32	Salem	25000

Write the SQL statements for the following scenario

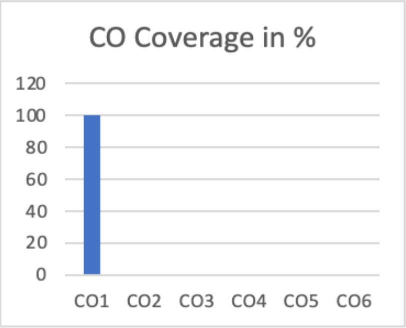
a.Write the query to create the following table and to insert the records.(2.5 Marks)

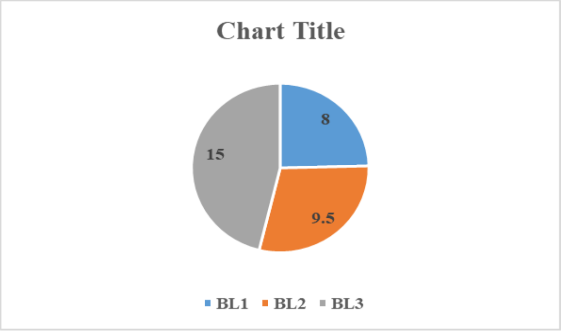
```
INSERT INTO Employee (EmpID, EmpName, EmpAge, EmpAddress, EmpSalary)

VALUES

    (101, 'Ganesh', 25, 'Chennai', 45000),

    (102, 'Rajesh', 21, 'Trichy', 75000),

    (103, 'Pradeep', 28, 'Madurai', 65000),

    (104, 'Murugan', 30, 'Madurai', 15000),
```

	(105, 'Velu', 32, 'Salem', 25000);
	b.Make Emp Id as primary key using alter command(2 Marks)
	ALTER TABLE Employee
	ADD PRIMARY KEY (EmpID);
	c. Change the salary as 39000 for the employees whose age is above 30 (2 Marks)
	UPDATE Employee
	SET EmpSalary = 39000
	WHERE EmpAge > 30;
	d.Execute truncate command using delete command.(1 Mark)
	Truncate table emp;					

***Program Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.**

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Audit Professor/Course Coordinator