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 – 3(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	---------- establish the top-bottom relation among the items. **a) Hierarchical schema** b) Network schema c) Relational schema d) Object oriented schema **Answer: a**	**1**	**L1**	**1**	**1**	**1.6.1**
2	Which statement is wrong regarding the role of database administrator? a) Authorization for data access **b) Network maintenance** c) Routine Maintenance d) Schema Definition. **Answer: b**	**1**	**L2**	**1**	**1**	**1.7.1**
3	Column in relational table is referred as---------- **a) Attribute** b) Tuple c) Domain d) Relation **Answer: a**	**1**	**L1**	**1**	**1**	**1.7.1**
4	A _____ key of a table can have more than one set of attributes that could be chosen as the key a. Foreign key b. Integrity key c. Relationship **d. Candidate key** **Answer: d**	**1**	**L1**	**1**	**1**	**1.7.1**
5	Architecture of the database can be viewed as	**1**	**L1**	**1**	**1**	**1.6.1**

	a) Two levels b) Four levels **c) Three levels** d) one level **Answer: C**					
6	Which of the following in not a function of DBA? **a) Network Maintenance** b) Routine Maintenance c) Schema Definition d) Authorization for data access **Answer : a**	**1**	**L1**	**1**	**1**	**1.7.1**
7	Data independence means a) Data is defined separately and not included in programs. b) Programs are not dependent on the physical attributes of data c) Programs are not dependent on the logical attributes of data **d) Both B and C** **Answer: d**	**1**	**L1**	**1**	**1**	**1.6.1**
8	Which of the following is generally used for performing tasks like creating the structure of the relations, deleting relation? a) DML b) DCL **c) DDL** d) Query **Answer: C**	**1**	**L1**	**1**	**1**	**1.7.1**
9	In database the term of table is _____, row indicated as _____ and column represents _____ **a) Relation, Record, Attribute** b) Record, Relation, Attribute c) Attribute, Relation, Record d) Attribute, Record, Relation **Answer: a**	**1**	**L1**	**1**	**1**	**1.7.1**
10	The _____ model that outlays the encapsulation, abstraction, identity of objects along with the relational data. a) Relational data model b) E-R data model **c) Object relational model** d) Network data model **Answer : c**	**1**	**L1**	**1**	**1**	**1.7.1**
	Part B (1 X 7.5 = 7.5)					
11.a	Demonstrate the different types of data models in detail. Certainly! Data models are abstract representations that define how data is organized and accessed. There are several types of data models, each with its own approach to representing and structuring data. Here, I'll provide an overview of four main types: 1. **Hierarchical Data Model:** **- Description:** - Organizes data in a tree-like structure with a top-down hierarchy. - Each parent node can have multiple child nodes, creating a parent-child relationship.	7.5	**L1**	**1**	**1**	**1.7.1**

- **Example:**

- Used in early database systems like IBM's Information Management System (IMS).

- In a company hierarchy, the CEO would be the top node, with departments and employees as child nodes.

2. Network Data Model:

- **Description:**

- Extends the hierarchical model by allowing many-to-many relationships between nodes.

- Nodes can have multiple parent and child nodes.

- **Example:**

- Used in database systems like CODASYL.

- In a university system, a student could be connected to multiple courses, and a course could have multiple students.

3. Relational Data Model:

- **Description:**

- Represents data as tables with rows and columns.

- Utilizes the concept of keys to establish relationships between tables.

- **Example:**

- Widely used in modern database management systems (DBMS) like MySQL, Oracle, and SQL Server.

- In a university database, you might have tables for students, courses, and enrollment, with keys linking them.

4. Entity-Relationship Model (ER Model):

-**Description:**

- Represents data in terms of entities, attributes, and relationships.

- Entities are objects or concepts, attributes describe properties, and relationships represent connections between entities.

- **Example:**

- Used in the design phase of database development.

- In a library database, entities could include books, authors, and borrowers, with relationships indicating

	who borrowed which book. Each data model has its strengths and weaknesses, and the choice of model depends on the specific requirements of the application and the preferences of the developers. In practice, the relational data model is the most widely used due to its simplicity, flexibility, and compatibility with modern database management systems.					
	OR					
11.b	Express the roles and responsibilities of Database Administrator with example A Database Administrator (DBA) plays a crucial role in managing and maintaining databases to ensure their optimal performance, security, and reliability. The responsibilities of a DBA can vary depending on the organization and the specific database system being used. Here are some common roles and responsibilities of a Database Administrator, along with examples: 1. **Database Design and Planning:** **- Responsibilities:** - Designing the database schema to meet the requirements of the application. - Planning for data storage, indexing, and optimization. - Example: - Designing a relational database schema for an e-commerce application, including tables for products, customers, and orders with appropriate relationships. 2. **Installation and Configuration:** **- Responsibilities:** - Installing and configuring database management systems (DBMS). - Setting up parameters for optimal performance. - **Example:** - Installing and configuring MySQL or Oracle on a server, specifying buffer sizes, cache configurations, and other system parameters. 3**. Security Management:** **- Responsibilities:** - Implementing security measures to protect data from unauthorized access. - Managing user accounts and permissions. - **Example:** - Setting up user accounts with specific privileges, ensuring that only authorized personnel can access sensitive data.	7.5	**L2**	**1**	**1**	**1.7.1**

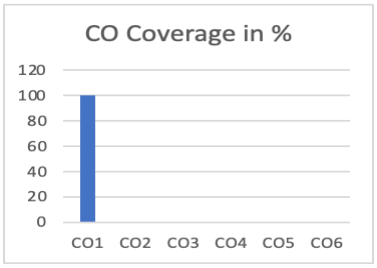
	4. **Backup and Recovery:** **- Responsibilities:** - Implementing regular backup strategies to prevent data loss. - Planning and executing recovery procedures in case of system failures. **- Example:** - Scheduling daily backups of a financial database and periodically testing the restoration process. 5. **Performance Monitoring and Tuning:** **- Responsibilities:** - Monitoring database performance and identifying bottlenecks. - Tuning queries and configurations for optimal speed. **- Example:** - Analyzing slow-running queries, optimizing indexes, and adjusting database parameters to improve overall system performance. 6**. Data Maintenance and Cleanup:** - Responsibilities: - Ensuring data integrity and consistency. - Performing routine maintenance tasks like data archiving and purging. - Example: - Identifying and removing obsolete records from a customer database to maintain efficient data storage. 7. **Database Documentation:** **- Responsibilities:** - Documenting database structures, configurations, and procedures. - Keeping documentation up-to-date for future reference. **- Example:** - Creating and maintaining documentation that includes the database schema, stored procedures, and backup and recovery processes.					

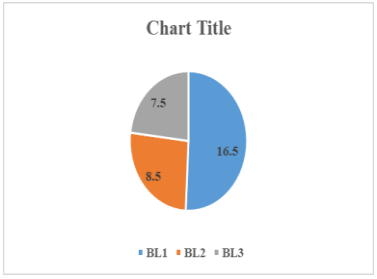
	8. **Capacity Planning:** **- Responsibilities:** - Estimating future growth and planning for increased data volume. - Scaling the database infrastructure to meet future demands. **- Example:** - Predicting the growth of an online platform's user base and expanding the database infrastructure to accommodate the increased data load. A Database Administrator plays a crucial role in ensuring the reliability, security, and performance of databases, contributing significantly to the overall success of an organization's IT infrastructure.					
	Part C (1 X 7.5 = 7.5)					
12	Consider an initial scenario wherein a conventional file system is employed by a small business to manage its data. Data integrity, access, and administration present difficulties for the organization as it expands. A Database Management System (DBMS) migration is being considered by the company as a solution to these challenges. By contrasting the two approaches, investigate the scenario. **Conventional File System:** **Challenges:** **1. Data Redundancy:** - In a file system, data is often duplicated across various files, leading to redundancy and inconsistency. - For example, customer information might be stored in multiple files, making it challenging to ensure that updates are applied consistently. **2. Limited Data Integrity:** - With multiple copies of the same data, maintaining data integrity becomes difficult. - It's prone to errors and inconsistencies, especially when updates or modifications are made to the data. **3. Limited Security and Access Control:** - File systems often lack robust security features, making it challenging to control access to sensitive information. - Setting up granular access controls based on user roles is limited or non-existent. **4. Scalability Challenges:** - As the business expands, adding more data and managing the increasing complexity becomes cumbersome. - File systems may not scale efficiently, leading to performance issues. **5. Limited Query and Reporting**	7.5	**L3**	**1**	**2**	**2.6.5**

	Capabilities: - Retrieving specific information or generating complex reports can be challenging and time-consuming. - There is a lack of query languages or tools for efficient data retrieval and analysis. **Database Management System (DBMS):** **Advantages:** **1. Data Centralization:** - A DBMS centralizes data in a structured manner, reducing redundancy and ensuring consistency. - For example, customer data can be stored in a single, well-defined table. **2. Enhanced Data Integrity:** - DBMS provides mechanisms such as constraints and transactions to maintain data integrity. - Ensures that updates or modifications are performed in a controlled and consistent manner. **3. Improved Security and Access Control:** - Robust security features allow for fine-grained control over data access. - User roles and permissions can be defined to restrict access to sensitive information. **4. Scalability:** - DBMS is designed to handle large amounts of data efficiently. - It can scale with the growing needs of the business without sacrificing performance. **5. Query and Reporting Capabilities:** - SQL (Structured Query Language) in DBMS enables powerful and efficient querying. - Reporting tools can easily extract, analyze, and present data, aiding decision-making processes. **6. Data Administration and Maintenance:** - Centralized administration tools make it easier to manage, monitor, and maintain the database. - Backups, recovery, and routine maintenance tasks are streamlined. **Conclusion:** In summary, migrating from a conventional file system to a Database Management System offers significant advantages in terms of data organization, integrity, security, scalability, and query capabilities. As the small business expands, adopting a DBMS becomes a more sustainable solution to manage and leverage its data effectively. The transition may require an initial investment in terms of training and setup, but the long-term benefits in data management and efficiency make it a valuable consideration for organizational growth.					

***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