

Plot No. 2, Knowledge Park-III, Greater Noida (U.P.) –201306

POST GRADUATE DIPLOMA IN MANAGEMENT (2024-25)
MID TERM EXAMINATION (TERM -IV)

Subject Name: **Database Concepts and Application**

Time: **01.00 hrs**

Sub. Code: **PGIT41**

Max Marks: **20**

Note: All questions are compulsory. Section A carries 10 marks: 2 questions of 5 marks each, Section B carries 10 marks one Case Study having 2 questions of 5 marks each.

<u>SECTION - A</u>		
Attempt all questions. All questions are compulsory.		05×2 = 10 Marks
Questions	CO	Bloom's Level
<p>Q. 1: (A). Discuss the key differences between a Database Management System (DBMS) and a File system for record management. Define Candidate Keys and Primary Keys in the context of relational databases.</p> <p align="center">Or</p> <p>Explain the 3-tier architecture of databases. Write the benefits of using a 3-tier architecture in database management.</p>	CO1	L4
<p>Q2 : What are Data Definition Language (DDL) statements, and how do they differ from Data Manipulation Language (DML) statements? Write sql query for creating table for storing student information like rollno, name, age, address.</p> <p align="center">Or</p> <p>Explain the concept of joins in SQL. What are the different types of joins. Explain Equi-Join with example</p>	CO2	L3
<u>SECTION – B</u>		
Read the case and answer the questions		05×2 = 10 Marks
Questions	CO	Bloom's Level
<p>Q. 5: Case Study:</p> <p align="center">Data Management Transformation at TechSmart Solutions</p> <p>Background TechSmart Solutions, a rapidly expanding technology firm, recognized the need for a robust database system to enhance its operations. As their client base grew, it became evident that streamlining data management was essential for supporting analytics and informed decision-making. To address this, the management team opted for a relational database management system (RDBMS) to effectively store client information, project details, and financial data.</p> <p>Initial Challenges: The project began with a series of workshops aimed at familiarizing the team with fundamental database concepts, including the differences between Database Management Systems (DBMS) and RDBMS. Maria, the project lead, highlighted how RDBMS offers structured data organization, which ensures data integrity and facilitates easier manipulation compared to traditional DBMS. As the team embarked on designing the database schema, they faced challenges with data modelling. They needed to choose between various data models, such</p>	CO1, CO2	L4 L4

as object-based and record-based logical models. After extensive discussions, they opted for a record-based model, which aligned well with their structured data needs. However, this decision led to confusion regarding the application of primary keys and foreign keys.

To resolve this, Maria organized a focused workshop on data abstraction and the mathematical definition of a relation. She explained key concepts like candidate keys, primary keys, and foreign keys, illustrating their importance in ensuring data integrity and establishing relationships between tables. This session empowered the team to apply these principles effectively in their database design.

SQL Implementation:

With the schema established, the team shifted focus to SQL, recognizing its significance in data analytics. They explored the SQL environment and its advantages, such as handling complex queries and performing efficient data manipulation. However, they also identified limitations, particularly regarding unstructured data, which posed challenges for their analytics objectives.

As the team practiced basic SQL queries, they encountered difficulties creating tables and utilizing Data Definition Language (DDL), Data Manipulation Language (DML), and Transaction Control Language (TCL) statements. A critical incident occurred when Sam, a junior developer, accidentally dropped a key table due to a miswritten DDL command. This incident underscored the necessity of understanding the ramifications of SQL commands and the importance of robust error handling protocols.

To prevent similar issues, Maria suggested incorporating Codd's rules as a framework for their relational database design. She emphasized adherence to these principles to ensure consistency and reliability within the database. The team subsequently began employing various SQL functions, operators, and syntax, enabling them to effectively perform single-row and multiple-row operations.

Preparing for Presentation:

As the database design neared completion, TechSmart Solutions prepared to present their findings to the executive team. Maria tasked the team with compiling a comprehensive report that showcased the database's capabilities and its potential impact on business analytics. They illustrated the data selection processes using SQL's SELECT statement, demonstrating how the database could drive data-informed decision-making.

On the day of the presentation, the team confidently showcased how their new database could revolutionize operations at TechSmart Solutions. They highlighted the benefits of utilizing a relational database, the power of SQL for data analytics, and their commitment to maintaining data integrity through effective key management practices.

Conclusion

This case study reflects the transformative journey of TechSmart Solutions as they navigated the complexities of database management. The experience provided valuable lessons on the importance of collaboration, continuous learning, and adherence to best practices in the ever-evolving field of data management. For management students, this case exemplifies the critical role that effective data management plays in strategic decision-making and operational success.

Questions based on the case study

1. What motivated TechSmart Solutions to transition to a relational database management system (RDBMS), and what specific challenges were they facing with their existing data management?

<p>B. How did Maria’s workshops contribute to the team’s understanding of key database concepts, and what specific topics were covered to facilitate this learning?</p> <p>2. A. Describe the significance of SQL in data analytics as highlighted in the case. What advantages and limitations did the team identify while working with SQL?</p> <p>B. Analyze the incident where a table was accidentally dropped due to a miswritten DDL command. What lessons did the team learn from this experience regarding SQL command usage and error handling?</p>		
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Kindly fill the total marks allocated to each CO’s in the table below:

COs	Marks Allocated
CO1	10 Marks
CO2	10 Marks
CO3	
CO4	

(Please ensure the conformity of the CO wise marks allocation as per your TLEP.)

Blooms Taxonomy Levels given below for your ready reference:

- L1= Remembering**
- L2= Understanding**
- L3= Apply**
- L4= Analyze**
- L5= Evaluate**
- L6= Create**