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Bachelor of Science in Information Technology
BSIT 3-1N

Database Administration
Signature:
Assignment #1

Instructions: Kindly read all the questions and write your answer in yellow pad paper together with your name, year, section, and signature.

1) What is data administration and why is it significant in the management of the database system? What are the key responsibilities of a data administrator?

→ Data Administration is the process where data is being maintained, monitored, and managed by a Database Administrator (DBA). It also ensures that the life cycle of data use and processing is on point to the desired objectives. It is significant in the management of database system as it supports decision-making processes, maintains data integrity and security, enhances collaboration and sharing among stakeholders, and it ensures that the data stored is organized, easy to access, and secured. Database Administrators (DBA) are the ones who manage the computer databases. Their key responsibilities are:

- Maintain and create database backup and recovery procedures
- Ensure data security compliance within database systems.
- Build, manage, and monitor databases and database applications.
- Modify and implement changes to database systems and information.
- Ensure that the database systems are storing and retrieving data as well as it ensure that the database applications and information are accessible to professionals.

2) What are the primary responsibilities of a database administrator (dba)? How does the DBA role evolve with the increasing complexity of database environments and technologies?

→ Database Administrators or DBA are responsible for managing, monitoring, and performance maintenance of an organization's database system. Their primary responsibilities are:

- Back-up and Recovery Procedures: DBAs must develop backup plans to

ensure data integrity and availability incase of data loss, threat, or theft.

- Security Management & Monitoring: DBAs must implement security practices to protect sensitive data from unauthorized access.
- Data Monitoring, Optimization, and Capacity Planning: DBAs must assure that the performance of the database is good to avoid loss of resources
- Database Modeling & Design: DBAs must create, maintain, and develop a database structure to ensure that the system is storing and retrieving data well
- Software Updates, Maintenance, and Troubleshooting: DBAs must keep updated to ensure the wellness of the Database performance and security.

→ The Database environments and technology are continuously evolving where the Database Administrators should keep up. They should be prepared, updated, and adaptable by the changes due to increasing complexity of the developing technologies. DBAs must enhance their security responsibilities, focus on Data Analytics, Data Compliance and DBAs must engage and collaborate more with their respective teams.

3.) Why is data security important in database management? What are some common strategies or best practices that DBAs can implement to protect sensitive data from unauthorized access?

→ Data Security is the process and practice of protecting digital information from threats, theft, corruption, and unauthorized access. Data security is important in Database Management to avoid costly fines and litigation, reputational damage and loss for businesses. To protect the data from unauthorized access and cyberattacks targeting sensitive data, the DBAs should implement the following:

- Authentication and Authorization: DBAs must ensure that strong passwords are used and additional layer of security is added to the Database system.
- Access Control: DBAs must implement Role-BAsed Access Control (RBAC) to ensure that only users have access to data necessary for their roles to minimize the attacks of unauthorized access.
- Backup and Recovery: DBAs must assure that there are backups which are encrypted and stored securely.

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• Data Encryption: Sensitive data should be encrypted in able to protect it.

4.) What is data availability and why is it critical for organizations? What are the three methods that DBAs can use to ensure high availability of Database systems?

→ Data Availability is the practice of ensuring that an organization's data can be accessed and used when needed. It helps to support businesses by enabling the consistent access to essential or needed data, facilitating informed decision making, aids risk mitigation against data loss, threat, and cyberattacks. The methods that DBAs can use to ensure high availability of database systems are the following:

• Data Replication Plans: it implements and maintains copies of the database that provides redundancy, improve read performance, and enables geographic distribution of data for recoveries.

• Load Balancing: It enhances data availability by preventing overloads on sewers.

• Data Performance Monitoring: Helps to monitor and identify easily if there's a problem, risk, or threats in the database.

5.) What does data quality mean in the context of database administration? What are the key dimensions of data quality and how can a DBA monitor and improve data quality within an organization?

→ Data Quality refers to the measure of the accuracy, completeness, consistency, timeliness, uniqueness, and validity as a criterion for dataset. It is essential for decision making, analysis, and also ensures operational efficiencies.

Data Quality Key Dimensions are:

• Accuracy: Accurate data is crucial for reliable operations.

• Completeness: Ensures that all necessary data is present.

• Consistency: Ensures that the data is uniform across different systems

• timeliness: Assures that the data is up-to-date and available when needed. It is crucial for making quick and accurate decisions.

• Uniqueness: Vital for maintaining data trust and integrity as it assures that every data entry is unique and free from duplications.

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- Validity: checks if the data conforms to the required format and business rules.

→ The Database Administrators could improve the data quality by managing, monitoring, and processing well these key dimensions. They must always be prepared and updated to the possible changes or risks regarding the database system.