**Database Management Assignment:-**

**Section A: Introduction to SQL/NoSQL**

1. You are working on a project where you need to store large amounts of structured and semi-structured data. Which type of database (SQL or NoSQL) would you choose and why? Explain with a practical example.

Sql is used when we need a to store a data that is structured and need consistency. As our project needs to store semi-structured data too and it needs to store large amount of data its better to opt for NoSQL as it provides everything that we need. NoSQL lets us to store structured, unstructured and semi-structured data while allowing scalability and flexible schema. If the data consistency is too important then we have have a hybrid approach where we use SQL to store structured data and NoSQL to store other data that does not require critical level of consistency.

1. A company wants to migrate from a relational database to a NoSQL database for better scalability. What challenges might they face? Discuss with an example.

If a company wants to move from relational database to NoSql database then its possible but it will arise some potential issues. Although the NoSQL will provide better scalability when deployed it will be hard to move all the data from SQL to NoSQL as SQL uses relations to store data, while NoSQL uses documents, key value pair, graphs. In other words the biggest challenge will be to perform data modelling.

**Section B: Advantages and Disadvantages of SQL/NoSQL**  
3. You are designing an e-commerce website's database. Explain the advantages and disadvantages of using SQL vs. NoSQL in this scenario.  
4. A banking system requires high consistency and ACID compliance. Which database system (SQL or NoSQL) would you recommend? Justify your answer with a real-world use case.

**Section C: Managing Databases**  
5. You are a database administrator and need to perform routine maintenance on a production database. Describe at least three essential database management tasks you would perform.  
6. An online streaming service needs to optimize its database performance. What strategies can be used for effective database management in this case?

**Section D: Identifying System Databases in SQL Server**  
7. List and describe the system databases in SQL Server. Provide one practical use case for each system database.  
8. You have accidentally deleted a user database in SQL Server. Which system database would you use to recover it, and how?

**Section E: Normalization Forms (1NF, 2NF, 3NF, BCNF)**  
9. Given the following unnormalized table:

| **OrderID** | **CustomerName** | **Product** | **Quantity** | **SupplierName** | **SupplierContact** |
| --- | --- | --- | --- | --- | --- |
| 101 | John Doe | Laptop | 1 | ABC Ltd. | 1234567890 |
| 102 | Jane Smith | Phone | 2 | XYZ Inc. | 9876543210 |

Convert it to 1NF, 2NF, and 3NF with proper explanations.

1. A company is facing redundancy issues in their database. How would applying BCNF help reduce redundancy? Explain with an example.

**End of Question Paper**