1. Explain the ACID properties in the context of database transactions. Describe each property (Atomicity, Consistency, Isolation, Durability) and explain why they are important for database management systems.
2. Discuss the differences between SQL and NoSQL databases. Include in your discussion the types of data models primarily supported by each, their scalability, and typical use cases.
3. What is normalization? Describe the first three normal forms. Explain the concept of normalization and why it is important in database design. Detail the first, second, and third normal forms, providing examples for each.
4. Describe the Entity-Relationship (ER) model and its components. Explain what an ER model is, including its main components such as entities, attributes, and relationships. Discuss how the ER model helps in designing a database.
5. Explain the concept of indexing in databases. Discuss what indexes are, why they are used in databases, and the impact they have on database performance. Include a discussion on different types of indexes such as primary index, secondary index, and clustered index.