Q1. What is Spring Data JPA?

✅ **Part of the Spring Data family that simplifies working with JPA.**

✅ **Removes boilerplate by providing built-in CRUD, pagination, and sorting.**

✅ **Automatically generates queries based on method names.**

✅ **Works on top of JPA providers like Hibernate.**

Q2: What are the key interfaces in Spring Data JPA?

✅ **CrudRepository: Basic CRUD operations.**

✅ **PagingAndSortingRepository: Adds pagination and sorting.**

✅ **JpaRepository: Most commonly used — combines CRUD, pagination, sorting, and more.**

✅ **Recommended to extend JpaRepository in real-world projects.**

Q3: How does method name-based query generation work?

✅ **Spring parses method names like findByEmail, findByAgeGreaterThan.**

✅ **Automatically generates SQL or JPQL behind the scenes.**

✅ **No need to manually write queries for basic operations.**

Q4: How do you write custom queries in Spring Data JPA?

✅ **Use @Query to define JPQL or native SQL manually.**

✅ **Use @Modifying with @Query for update or delete operations.**

✅ **Enables full control when method names aren't enough.**

Q5: What's the difference between findById and getOne?

✅ **findById(): Returns Optional.**

✅ **Executes the query immediately (eager fetch).**

✅ **getOne(): Returns a lazy-loaded proxy.**

✅ **Deprecated — use getReferenceById() instead (Spring Data 2.5+).**

Q6: How do you enable pagination and sorting in Spring Data JPA?

✅ **Use Pageable for pagination support.**

✅ **Use Sort to order results by field.**

✅ **Apply both to repository methods.**

✅ **Useful for APIs and admin panels handling large datasets.**

Q7: What's the difference between @Entity, @Table, and @Id?

✅ **@Entity: Declares a class as a JPA entity.**

✅ **@Table: Maps to a specific table name in the database.**

✅ **@Id: Identifies the primary key field of the entity.**

✅ **Together, they define how objects map to database rows.**

Q8: What is the difference between lazy and eager loading?

✅ **Lazy (default for collections): Loads data only when it's accessed.**

✅ **Eager (default for single entities): Loads data immediately with the parent entity.**

Q9: How do you handle transactions in Spring Data JPA?

✅ **Use @Transactional to define transaction boundaries.**

✅ **@Transactional(readOnly = true) for read-only methods.**

✅ **Apply on service layer for write operations.**

✅ **Spring automatically handles transactions in most public repository methods.**

Q10: What's the difference between Spring Data JPA and Hibernate?

✅ **Hibernate is the JPA provider — handles ORM and persistence logic.**

✅ **Spring Data JPA is a higher-level abstraction over JPA.**

✅ **Provides a simpler, declarative way to build repositories.**

✅ **Reduces boilerplate, especially for CRUD and query logic.**

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