Question Set JPA-Hibernate

Set 1

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Describe the lifecycle of a JPA entity with a detailed state diagram. (5 Marks)

2. Compare the advantages of JPA over Hibernate in a multi-threaded environment. Justify with examples. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Write a JPA entity class "Employee" with fields: id, name, department, and salary. Use annotations. (5 Marks)

2. Write code to persist an "Employee" object using EntityManager, including transaction management. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the role of the @Entity annotation in JPA? (2 Marks)

2. Explain the difference between @OneToOne and @OneToMany relationships in Hibernate. (2 Marks)

3. What is the purpose of the persistence.xml file in JPA? (2 Marks)

4. What is eager loading in Hibernate? Provide a real-world e-commerce example. (2 Marks)

5. How does the Criteria API differ from JPQL in terms of query construction? (2 Marks)

Set 2

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of object-relational mapping (ORM) in JPA with a use case. (5 Marks)

2. Analyze the performance implications of using Hibernate with large datasets. Justify your analysis. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Product" with fields: id, name, price, and stock. Use appropriate annotations. (5 Marks)

2. Write code to update a "Product" object in the database using JPA, including transaction handling. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the significance of the @Id annotation in JPA entities? (2 Marks)

2. Describe the @JoinColumn annotation and its usage in Hibernate relationships. (2 Marks)

3. What is the role of the EntityManager in JPA? (2 Marks)

4. What is lazy loading in Hibernate? Give a real-world library management example. (2 Marks)

5. Explain the benefits of using named queries in JPA. (2 Marks)

Set 3

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of caching in Hibernate and its impact on application performance. (5 Marks)

2. Compare the use of Hibernate with Spring Data JPA in a web application. Justify your preference. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Order" with fields: id, orderDate, and totalAmount. Use annotations. (5 Marks)

2. Write code to delete an "Order" object from the database using JPA transactions. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the purpose of the @GeneratedValue annotation in JPA? (2 Marks)

2. Explain the difference between merge() and persist() methods in EntityManager. (2 Marks)

3. What is the significance of the hibernate.cfg.xml file? (2 Marks)

4. What are the different types of caching in Hibernate? (2 Marks)

5. How does Hibernate handle optimistic locking? (2 Marks)

Set 4

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of inheritance mapping in JPA with a class hierarchy example. (5 Marks)

2. Evaluate the scalability of Hibernate in a distributed system. Provide justifications. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Customer" with fields: id, name, and email. Use annotations. (5 Marks)

2. Write code to retrieve all "Customer" objects using a JPA query with transaction support. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the role of the @Column annotation in JPA? (2 Marks)

2. Describe the @ManyToMany relationship with an example in Hibernate. (2 Marks)

3. What is the difference between get() and load() methods in Hibernate? (2 Marks)

4. What is the purpose of the second-level cache in Hibernate? (2 Marks)

5. Explain the use of @Version annotation in JPA for concurrency control. (2 Marks)

Set 5

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of the JPA Criteria API in building dynamic queries. (5 Marks)

2. Compare the transaction management in Hibernate with native JDBC. Justify your comparison. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Book" with fields: id, title, and author. Use annotations. (5 Marks)

2. Write code to perform a bulk update on "Book" objects using JPA Query. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the significance of the @Table annotation in JPA? (2 Marks)

2. Explain the @Embedded and @Embeddable annotations in Hibernate. (2 Marks)

3. What is the role of the SessionFactory in Hibernate? (2 Marks)

4. What are the advantages of using HQL over native SQL? (2 Marks)

5. How does Hibernate handle bidirectional relationships? (2 Marks)

Set 6

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of detached entities in Hibernate with a scenario. (5 Marks)

2. Analyze the security implications of using Hibernate in a web application. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Student" with fields: id, name, and grade. Use annotations. (5 Marks)

2. Write code to fetch a "Student" object by id using JPA with transaction management. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the purpose of the @Transient annotation in JPA? (2 Marks)

2. Describe the @Inheritance annotation and its strategies in Hibernate. (2 Marks)

3. What is the difference between flush() and clear() in Hibernate Session? (2 Marks)

4. What is the role of the hibernate.dialect property? (2 Marks)

5. Explain the concept of cascading in JPA relationships. (2 Marks)

Set 7

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of the JPA metamodel in type-safe queries. (5 Marks)

2. Compare the performance of Hibernate with Entity Framework in a Java application. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Teacher" with fields: id, name, and subject. Use annotations. (5 Marks)

2. Write code to save a "Teacher" object and commit the transaction using JPA. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the role of the @NamedQuery annotation in JPA? (2 Marks)

2. Explain the @OrderBy annotation in Hibernate relationships. (2 Marks)

3. What is the purpose of the Session in Hibernate? (2 Marks)

4. What are the different fetch types in JPA? (2 Marks)

5. How does Hibernate handle database schema generation? (2 Marks)

Set 8

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of entity graphs in JPA and their benefits. (5 Marks)

2. Evaluate the use of Hibernate in microservices architecture. Justify with examples. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Course" with fields: id, name, and duration. Use annotations. (5 Marks)

2. Write code to remove a "Course" object from the database using JPA. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the significance of the @SequenceGenerator annotation? (2 Marks)

2. Describe the @MapKey annotation in Hibernate. (2 Marks)

3. What is the difference between refresh() and lock() in EntityManager? (2 Marks)

4. What is the role of the hibernate.hbm2ddl.auto property? (2 Marks)

5. Explain the concept of dirty checking in Hibernate. (2 Marks)

Set 9

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of the JPA Provider in managing persistence contexts. (5 Marks)

2. Compare the use of Hibernate with plain JDBC for complex queries. Justify your stance. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Project" with fields: id, name, and startDate. Use annotations. (5 Marks)

2. Write code to query all "Project" objects using JPQL with transaction support. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the purpose of the @Lob annotation in JPA? (2 Marks)

2. Explain the @NaturalId annotation in Hibernate. (2 Marks)

3. What is the role of the PersistenceUnit in JPA? (2 Marks)

4. What are the disadvantages of eager fetching in Hibernate? (2 Marks)

5. How does Hibernate manage connection pooling? (2 Marks)

Set 10

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of persistence context in JPA with a lifecycle example. (5 Marks)

2. Analyze the impact of Hibernate on memory usage in a large-scale application. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Department" with fields: id, name, and location. Use annotations. (5 Marks)

2. Write code to update a "Department" object using JPA EntityManager. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the role of the @Basic annotation in JPA? (2 Marks)

2. Describe the @BatchSize annotation in Hibernate. (2 Marks)

3. What is the difference between evict() and clear() in Hibernate Session? (2 Marks)

4. What is the purpose of the hibernate.cache.use_second_level_cache property? (2 Marks)

5. Explain the use of @PrePersist and @PostPersist annotations in JPA. (2 Marks)

Set 11

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of the JPA Query Language (JPQL) in abstracting SQL. (5 Marks)

2. Compare the use of Hibernate with EclipseLink in a Java EE application. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Supplier" with fields: id, name, and contact. Use annotations. (5 Marks)

2. Write code to fetch a "Supplier" object by name using Criteria API. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the significance of the @Index annotation in JPA? (2 Marks)

2. Explain the @ElementCollection annotation in Hibernate. (2 Marks)

3. What is the role of the EntityTransaction in JPA? (2 Marks)

4. What are the benefits of using a second-level cache? (2 Marks)

5. How does Hibernate handle pessimistic locking? (2 Marks)

Set 12

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of entity listeners in JPA with an example. (5 Marks)

2. Evaluate the suitability of Hibernate for real-time applications. Justify your evaluation. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Invoice" with fields: id, amount, and date. Use annotations. (5 Marks)

2. Write code to persist multiple "Invoice" objects in a single transaction. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the purpose of the @Convert annotation in JPA? (2 Marks)

2. Describe the @Fetch annotation in Hibernate. (2 Marks)

3. What is the difference between contains() and isLoaded() in Hibernate? (2 Marks)

4. What is the role of the hibernate.show_sql property? (2 Marks)

5. Explain the concept of orphan removal in JPA. (2 Marks)

Set 13

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of the JPA specification in ensuring portability. (5 Marks)

2. Compare the use of Hibernate with OpenJPA in a cloud environment. Justify your choice. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Employee" with fields: id, name, and salary. Use annotations. (5 Marks)

2. Write code to perform a join query between "Employee" and "Department" using JPQL. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the role of the @PrimaryKeyJoinColumn annotation? (2 Marks)

2. Explain the @Formula annotation in Hibernate. (2 Marks)

3. What is the purpose of the merge() method in EntityManager? (2 Marks)

4. What are the disadvantages of lazy fetching in Hibernate? (2 Marks)

5. How does Hibernate handle database transactions? (2 Marks)

Set 14

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of mapped superclasses in JPA with a practical example. (5 Marks)

2. Analyze the impact of Hibernate on database schema evolution. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Student" with fields: id, name, and age. Use annotations. (5 Marks)

2. Write code to query "Student" objects using Criteria API with a condition. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the significance of the @UniqueConstraint annotation? (2 Marks)

2. Describe the @Where annotation in Hibernate. (2 Marks)

3. What is the role of the PersistenceContext in JPA? (2 Marks)

4. What is the purpose of the hibernate.jdbc.batch_size property? (2 Marks)

5. Explain the use of @PostLoad annotation in JPA. (2 Marks)

Set 15

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of the JPA lifecycle callbacks in entity management. (5 Marks)

2. Compare the use of Hibernate with DataNucleus in a distributed system. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Product" with fields: id, name, and price. Use annotations. (5 Marks)

2. Write code to delete multiple "Product" objects using a JPA query. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the purpose of the @Access annotation in JPA? (2 Marks)

2. Explain the @NotFound annotation in Hibernate. (2 Marks)

3. What is the difference between detach() and close() in EntityManager? (2 Marks)

4. What is the role of the hibernate.generate_statistics property? (2 Marks)

5. How does Hibernate handle composite primary keys? (2 Marks)

Set 16

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of entity relationships in JPA with a UML diagram. (5 Marks)

2. Evaluate the use of Hibernate in a high-availability system. Justify with examples. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Order" with fields: id, orderId, and status. Use annotations. (5 Marks)

2. Write code to update the status of an "Order" object using JPA. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the role of the @ManyToOne annotation in JPA? (2 Marks)

2. Describe the @Cache annotation in Hibernate. (2 Marks)

3. What is the purpose of the persist() method in EntityManager? (2 Marks)

4. What are the benefits of using hibernate.hbm2ddl.auto? (2 Marks)

5. Explain the concept of proxy objects in Hibernate. (2 Marks)

Set 17

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Discuss the role of the JPA Type Converter in data transformation. (5 Marks)

2. Compare the use of Hibernate with MyBatis in a data-driven application. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Design a JPA entity class "Customer" with fields: id, name, and address. Use annotations. (5 Marks)

2. Write code to fetch "Customer" objects using a JPQL join query. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the significance of the @Temporal annotation in JPA? (2 Marks)

2. Explain the @Filter annotation in Hibernate. (2 Marks)

3. What is the role of the Session.getTransaction() in Hibernate? (2 Marks)

4. What is the purpose of the hibernate.cache.use_query_cache property? (2 Marks)

5. How does Hibernate handle nullable columns? (2 Marks)

Set 18

Section A: Technical & Analytical (10 Marks - 2 Questions)

1. Explain the concept of query hints in JPA with an example. (5 Marks)

2. Analyze the impact of Hibernate on application startup time. (5 Marks)

Section B: Coding (10 Marks - 2 Questions)

1. Create a JPA entity class "Book" with fields: id, title, and publisher. Use annotations. (5 Marks)

2. Write code to perform a bulk insert of "Book" objects using JPA. (5 Marks)

Section C: QA (10 Marks - 5 Questions)

1. What is the role of the @Enumerated annotation in JPA? (2 Marks)

2. Describe the @OnDelete annotation in Hibernate. (2 Marks)

3. What is the difference between isOpen() and isConnected() in Hibernate? (2 Marks)

4. What is the purpose of the hibernate.c3p0 properties? (2 Marks)

5. Explain the use of @PreUpdate and @PostUpdate annotations in JPA. (2 Marks)
