**Important Instructions**

Max Marks : **100**

Duration : **3 hours**

1. This exam will be held in pen and paper mode.
2. Keep your mobile phones, laptops and other electronic items switched off during examination
3. This paper consists of True/False, MCQ and subjective type questions.
4. There will be no negative marking.

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**TRUE FALSE (5 Marks)**

**Instructions** : Write description in support of your answer.

: Each question consist of 1 mark (0.5 mark for correct answer , 0.5 mark for description)

**Q1)** Java is platform independent language.

**Q2)** Session Factory in hibernate is heavyweight object, thread safe.

**Q3)** We can have more than 1 primary key in a table.

**Q4)** In JavaScript we can use (function, variables) before they are declared.

**Q5)** SQLException is a Checked Exception

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**SHORT ANSWER QUESTION (10 Marks)**

**Instructions** : Write brief answer in 2-3 lines, write only pseudocode where coding is required.

: Each question consist of 2 marks

**Q1)** Write a short program to swap two nos without using third variable (eg a=10, b=50 after swap a=50, b=10)

**Q2)** Explain the terms JDK, JVM, JRE.

**Q3)** Explain the OOPS features Encapsulation & Inheritance.

**Q4)** Explain the advantages of Spring MVC framework.

**Q5)** Explain Checked and unchecked exceptions in brief along with examples.

**MCQ (15 Marks)**

**Instructions** : Write all the correct options .

: Each question consists of 1 mark (full marks will be awarded on selecting all the correct option/s only)

**Q1)**  Which of the following Exceptions, is a checked Exception?

a) ArrayIndexOutOfBoundsException

b) FileNotFoundException

c) ArithmeticException

d) NullPointerException

**Q2)** \_\_\_\_\_\_\_ key maintains the referential integrity in a relation

a) Super

b) Foreign

c) Primary

d) Candidate

**Q3)** Given the sequence of operations - push (10), push (20), pop, push (30), push (30), pop, pop, push (50), pop are performed on a stack, what are the elements left in the stack starting from the last item down to the first item?

a) 30

b) 20, 10

c) 10

d) 50, 30, 10

**Q4)** ORM stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) Object Rate Mapping

b) OOPs Relational Mapping

c) Object Relational Mapping

d) Output Related Mapping

**Q5)** Threads in Java can be created using

a) Thread Class only

b) Runnable Interface only

c) Thread Class & Runnable Interface

d) None

**Q6)** Which of the following modifiers are used to signify that, the data members of a class need not be Serialized

during the process of Serialization?

a) volatile

b) transient

c) static

d) UnSerialized

**Q7)** In a business scenario,there is some Data element about a particular product's Balance Quantity On Hand , this data can be accessed by Multiple threads processing Orders, in order to ensure that this data is not accessed by multiple threads simultaneously for any modification, which of the following features of Threads can be implemented?

a) Volatile

b) Synchronized(data within synchronized function)

c) Transient

d) locks

**Q8)**  What is ACID property of Transactions?

a) Atomicity, Consistency, Isolation, Database

b) Atomicity, Consistency, Isolation, Durability

c) Atomicity, Consistency, Inconsistent, Durability

d) Automatically, Concurrency, Isolation, Durability

**Q9 )** The term HTTP stands for?

1. Hyper terminal tracing program
2. Hypertext tracing protocol
3. Hypertext transfer protocol
4. Hypertext transfer program

**Q10 )** Which of the followingare the Core principles of Spring MVC?

* 1. Segregation of Concerns, Inversion of Control, Dependency Injection & AOP
  2. Segregation of Concerns, Inversion of Control, AOP & Tight Coupling
  3. Segregation of Concerns, Inversion of Control, Dependency Injection & Synchronization
  4. Segregation of Concerns & Tight Coupling.

**Q11 )** Which of the following Annotations is used to denote a Controller for a Restful Service?

a. @Controller

1. @RestfulController
2. @RestController
3. @RestService

**Q12 )** Which of the following Annotations is used to denote a Class representing a table of Database in Hibernate?

a. @Model

1. @Entity
2. @Table
3. @Data

**Q13 )** Which of the following Tools can be used to test a Restful Service?

a. Postman & Swagger

1. DBMS & JUnit
2. DBMS & Eclipse
3. None of these

**Q14 )** Which of the following Tools can be used to test a Restful Service?

a. Postman & Swagger

1. DBMS & JUnit
2. DBMS & Eclipse
3. None of these

**Q15 )** Which of the following Tools can be used to generate setters, getters & constructors of a class?

a. Lombok

1. JUnit
2. Postman
3. None of these

**SUBJECTIVE (70 Marks)**

**Instructions** : Write full code for all the questions.

: Any shortcut / improper statements / syntax errors will lead to deduction of marks.

: Use production standard naming conventions and package structures.

**Q1)** Create a class called Customer with the following data members. Marks : **15**

**customerId, customerName, customerAddress** & **customerPhone**

with apt data types

Create another class **ClientClass** , which has a data member of the array type as shown below with parameter less constructor & overloaded constructor along with the following methods.

class ClientClass

{

Customer[] customers;

public void acceptCustomers()

{

}

public void displayCustomers()

{

}

public static void main(String[] args)

{

}

}

**acceptCustomers()** method should ask the user to enter the number of customers he wishes to enter and accordingly accept the Customer Data and populate the Customers array and the same should be displayed on the Console using **displayCustomers()** method.

Call these methods from the main method.

**Q2)** Create an application using the Collections - ArrayList of Book type Marks : **15**

Book with the following data members

**BookId,**

**BookName,**

**BookAuthorName**

**BookPrice**

with suitable data types.

Implement custom methods using which one should be able to view all books, add, delete, search by BookId & update by BookId by implementing the following skeleton

methods

1) viewBooks()

2) add(Book book){}

3) deleteBookById(String bookId)

4) updateBookById(String bookId, Book book)

**Q3)** Create a REST API service using Spring Boot and JPA. Marks : **20**

Write the logic for the following functionalities using the appropriate URIs and http methods

1. Retrieve all students
2. Get details of a specific student using id
3. Delete a student

Student object will have following fields

1. rollNo of type int
2. firstName of type String
3. lastName of type String
4. marks of type Int

Note : You don’t have to write boilerplate code such as getter and setter, and/or configuration code . Create Controller, Service, Repository logic in separate class.

**Q4) 20 marks**

Write the code logic to perform the **Insert & Read** operation of employee table {**EmpId, FirstName, LastName, Address, Salary**}

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