JAVA PRACTICAL EXAM QUETIONS

1. **Write a program to implement a class that calculates and prints the factorial of a given number.**

```
import java.util.Scanner;


class Factorial {
   int num;
   void getNumber() {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a number: ");
      num = sc.nextInt();
   }
   void findFactorial() {
      int fact = 1;
      for (int i = 1; i <= num; i++) {
         fact = fact * i;
      }
      System.out.println("Factorial of " + num + " = " + fact);
   }
}


public class Main {
   public static void main(String[] args) {
      Factorial f = new Factorial();
      f.getNumber();
      f.findFactorial();
   }
}
```

2. **Write a program to demonstrate the use of a superclass constructor being invoked by a subclass.**
3. **Write a program to implement method overriding in a class.**
4. **Write a program that raises an exception when a number is divided by zero.**

5. **Write a program to create form validation for name, email, password, and confirm password fields.**

```
<!DOCTYPE html>
<html>
<head>
 <title>Simple Form Validation</title>
</head>
<body>
 <h2>Form Validation</h2>
 <form onsubmit="return validateForm()">
  Name: <input type="text" id="name"><br><br>
  Email: <input type="text" id="email"><br><br>
  Password: <input type="password" id="password"><br><br>
  Confirm Password: <input type="password" id="confirmPassword"><br><br>
  <input type="submit" value="Submit">
 </form>

 <script>
  function validateForm() {
   let name = document.getElementById("name").value;
   let email = document.getElementById("email").value;
   let password = document.getElementById("password").value;
   let confirmPassword = document.getElementById("confirmPassword").value;

   if (name == "") {
    alert("Please enter your name");
    return false;
   }

   if (email == "") {
    alert("Please enter your email");
    return false;
   }

   if (password == "") {
    alert("Please enter your password");
```

```
      return false;
    }

    if (confirmPassword == "") {
      alert("Please confirm your password");
      return false;
    }

    if (password != confirmPassword) {
      alert("Passwords do not match");
      return false;
    }

    alert("Form submitted successfully!");
    return true;
  }
 </script>
</body>
</html>
```

REGEX IF ASKED TO DO USING IT

```
let emailPattern = /^[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\.[a-z]{2,4}$/;
```

6. **Write a program to demonstrate method overloading to find the area of a circle, rectangle, and triangle.**

```
class AreaCalculator {

  // Method to find area of a circle
  double area(double radius) {
    return 3.1416 * radius * radius;
  }

  // Method to find area of a rectangle
  double area(double length, double breadth) {
    return length * breadth;
  }
```

```
    // Method to find area of a triangle
    double area(double base, double height, boolean isTriangle) {
        return 0.5 * base * height;
    }

    public static void main(String[] args) {
        AreaCalculator calc = new AreaCalculator();

        double circleArea = calc.area(5); // radius = 5
        double rectangleArea = calc.area(4, 6); // length = 4, breadth = 6
        double triangleArea = calc.area(4, 5, true); // base = 4, height = 5

        System.out.println("Area of Circle: " + circleArea);
        System.out.println("Area of Rectangle: " + rectangleArea);
        System.out.println("Area of Triangle: " + triangleArea);
    }
}
```

7. **Write a program to demonstrate constructor overloading using a Student class and display the details of the student.**

```
class Student {
    int rollNo;
    String name;
    int age;

    // Constructor 1: No arguments
    Student() {
        rollNo = 0;
        name = "Unknown";
        age = 0;
    }

    // Constructor 2: Two arguments
    Student(int r, String n) {
        rollNo = r;
        name = n;
        age = 0;
```

```
    }

    // Constructor 3: Three arguments
    Student(int r, String n, int a) {
        rollNo = r;
        name = n;
        age = a;
    }

    // Method to display student details
    void display() {
        System.out.println("Roll No: " + rollNo);
        System.out.println("Name: " + name);
        System.out.println("Age: " + age);
        System.out.println("-------------------------");
    }

    public static void main(String[] args) {
        // Creating objects using different constructors
        Student s1 = new Student();
        Student s2 = new Student(101, "Rahul");
        Student s3 = new Student(102, "Priya", 20);

        // Display details
        s1.display();
        s2.display();
        s3.display();
    }
}
```

8. **Design a web page using HTML, CSS, and JavaScript that changes the background color of the page when a button is pressed.**

```
<!DOCTYPE html>
<html>
<head>
  <title>Change Background Color</title>
  <style>
```

```
    button {
      padding: 10px 20px;
      font-size: 18px;
      border: none;
      border-radius: 8px;
      background-color: #333;
      color: white;
      cursor: pointer;
    }

    button:hover {
      background-color: #555;
    }
  </style>
</head>
<body>

  <h2>Click the button to change background color</h2>
  <button onclick="changeColor()">Change Color</button>

  <script>
    function changeColor() {
      // Array of colors
      let colors = ["#FF5733", "#33FF57", "#3357FF", "#FFD700", "#FF33A8", "#00CED1"];

      // Pick a random color
      let randomColor = colors[Math.floor(Math.random() * colors.length)];

      // Apply the color to body background
      document.body.style.backgroundColor = randomColor;
    }
  </script>

</body>
</html>
```

9. **Design a React web application that changes the background color of the page when a button is clicked.**

```
import React, { useState } from "react";

function App() {
 // Step 1: Create a state variable for background color
 const [bgColor, setBgColor] = useState("lightblue");

 // Step 2: Function to change background color
 const changeColor = () => {
  const colors = ["#FF5733", "#33FF57", "#3357FF", "#FFD700", "#FF33A8", "#00CED1"];
  const randomColor = colors[Math.floor(Math.random() * colors.length)];
  setBgColor(randomColor);
 };

 // Step 3: Return UI
 return (
  <div
   style={{
    backgroundColor: bgColor,
    height: "100vh",
    display: "flex",
    flexDirection: "column",
    justifyContent: "center",
    alignItems: "center",
   }}
  >
   <h2>Click the button to change background color</h2>
   <button
    onClick={changeColor}
    style={{
     padding: "10px 20px",
     fontSize: "18px",
     border: "none",
     borderRadius: "8px",
     backgroundColor: "#333",
```

```
        color: "white",
        cursor: "pointer"
       }}
      >
       Change Color
      </button>
    </div>
  );
}

export default App;
```

10. Write a program to display a real-time digital clock on a web page.

```
<!DOCTYPE html>
<html>
<head>
  <title>Digital Clock</title>
  <style>
    body {
      text-align: center;
      background-color: lightblue;
      font-family: Arial;
    }
    #clock {
      font-size: 60px;
      color: darkblue;
      margin-top: 200px;
    }
  </style>
</head>
<body>
  <h1>Digital Clock</h1>
  <div id="clock"></div>

  <script>
    function showTime() {
```

```
        let time = new Date();
        let hours = time.getHours();
        let mins = time.getMinutes();
        let secs = time.getSeconds();

        // Add 0 before single-digit numbers
        if (hours < 10) hours = "0" + hours;
        if (mins < 10) mins = "0" + mins;
        if (secs < 10) secs = "0" + secs;

        document.getElementById("clock").innerText = hours + ":" + mins + ":" + secs;
      }

      setInterval(showTime, 1000); // Update every second
      showTime(); // Call once at start
    </script>
  </body>
  </html>
```

11. Write a program to implement a simple image slider using JavaScript.

```
<!DOCTYPE html>
<html>
<head>
  <title>Simple Image Slider</title>
</head>
<body style="text-align:center; font-family:Arial;">

  <h2>Simple Image Slider</h2>

  <img id="slider" src="https://media.istockphoto.com/id/1458782106/photo/scenic-aerial-view-of-the-mountain-landscape-with-a-forest-and-the-crystal-blue-river-in.jpg?s=612x612&w=0&k=20&c=NXQ_OK6JtmyRRBef8Wd67UZ3scQJKySkXl1ORaActH4="
width="400" height="250">

  <br><br>

  <button onclick="prev()">Previous</button>
```

```
 <button onclick="next()">Next</button>


 <script>
   let images = [
    "https://media.istockphoto.com/id/1458782106/photo/scenic-aerial-view-of-the-mountain-landscape-with-a-forest-and-the-crystal-blue-river-in.jpg?s=612x612&w=0&k=20&c=NXQ_OK6JtmyRRBef8Wd67UZ3scQJKySkXl1ORaActH4=",
    "https://media.istockphoto.com/id/583809524/photo/alberta-wilderness-near-banff.jpg?s=612x612&w=0&k=20&c=hiI3ib9ibDxAgqEZEH09EO3JOw94v5xh6hzcuXGhO-M=",
    "https://media.istockphoto.com/id/1337232523/photo/high-angle-view-of-a-lake-and-forest.jpg?s=612x612&w=0&k=20&c=72ZZZG5jNaEE0QRq6o4pUk3CI0gG-Lw5AeWQUVgO7zQ=",
    "https://media.istockphoto.com/id/1202227531/photo/beautiful-emerald-colored-glacial-rivers-of-iceland-taken-from-a-helicopter.jpg?s=612x612&w=0&k=20&c=Ssi0UDmtNGF89mSpq_t7f-XChvV0_RO8xO5p5xvz35Y="
   ];

   let index = 0;

   function next() {
    index = (index + 1) % images.length;
    document.getElementById("slider").src = images[index];
   }

   function prev() {
    index = (index - 1 + images.length) % images.length;
    document.getElementById("slider").src = images[index];
   }
 </script>

</body>
</html>
```

12. Write a program using JSP and JDBC to add two numbers and display the output.

13. Write a JavaScript function to find the highest marks and the student who scored them.

```
<!DOCTYPE html>
<html>
<head>
```

```
  <title>Highest Marks Finder</title>
</head>
<body style="font-family: Arial; text-align: center; margin-top: 50px;">

  <h2>Find Highest Marks and Student</h2>

  <script>
    // Array of students with their marks
    let students = [
      { name: "Amit", marks: 85 },
      { name: "Riya", marks: 92 },
      { name: "Karan", marks: 78 },
      { name: "Sneha", marks: 95 },
      { name: "Rahul", marks: 88 }
    ];

    // Function to find highest marks
    function findHighest(students) {
      let highest = students[0]; // assume first student has highest marks

      for (let i = 1; i < students.length; i++) {
        if (students[i].marks > highest.marks) {
          highest = students[i];
        }
      }

      document.write("<h3>Highest Marks: " + highest.marks + "</h3>");
      document.write("<h3>Student Name: " + highest.name + "</h3>");
    }

    // Call the function
    findHighest(students);
  </script>

</body>
</html>
```

14. Write a program to implement HTTP servlets.

15. Create a "View Student" page that fetches student details from MySQL and displays them in a table on the webpage.