2) Write a code demonstrating the steps to establish a database connection using JDBC. Write a java program to accept the details of Teacher (TId, Name, Address) from the user and insert it into the MySQL database, specifying the necessary connection parameters such as URL, username, and password.

```
Public Class TeacherInsert{
  Public static void main (String[] args){
  Scanner scanner = new Scanner(System.in);
 String url = "jdbc:mysql://localhost:3306/
                                 School";
  String username : "root";
  String password: "your-password";
 System.out.Println ("Enter Teacher ID:");
   int tId = scanner.nextInt();
 scanner.nextLine();
   System.out.Println ("Enter TeacherName:");
   String name = scanner.nextLine();
   System.out.Println ("Enter Teacher
                      Address:");
     String address=scanner.nextLine();
 String sql = "INSERT INTO teacher (TId,
      Name, Address) VALUES (?,?,?)";
   }catch (SQLException e){
          e.printStackTrace();
         }finally{
          scanner.close();
```

Experiment#			
Date		Student ID	
		Student Name	

In-Lab:

1) You are developing a student information management system. Implement a servlet called "StudentDetailsServlet" that accepts student details (student ID, student name, address, program) through a form submission. The servlet should store these details in a database using JDBC integration. CRUD operations on Student Database sequence of steps to follow:
   A. Create a Student Database using JDBC program
   B. Create a Registration Table Inside Student Database with the fields ((i)id (ii)name(iii)address(iv)program and make id as a primary key) using JDBC Program
   C. Insert 4 records in Registration Table of Student Database using JDBC Program
   D. Display the records inserted in Registration Table using JDBC Program
   E. Update the age of student as 30 whose id values are as 100 and 101 using JDBC Program.
   F. Delete a Student Record whose id=101 from Registration Table using JDBC Program.

Procedure/Program:

```
import java.sql.*;
 Public class void main(String[] args){
  Stringurl ="jdbc:mysql://localhost:3306/
   String username :"root";
   String password :"your-password";
try (Connection conn = DriverManager.get
  Connection(url, username, password)){
 statement stmt = conn.createStatement();
stmt.executeUpdate("CREATEDATABASE IF
           NOT EXISTS studentDB");
System.out.Println("Student Database
              created Successfully!");
Stmt.excauteupdate ("USE StudentsDB");
 String CreateTableSQL = "CREATE TABLE IF NOT
                 EXISTS Registration (" + Id int Primary
                       key " + "name varchar (100),
                        address VARCAR(255),
                         "Program VARCAR (200)";
            Stmt.execute update (CreateTableSQL);
           System.outprintln ("Registration table
                   Created Successfully");
         String updateSQL = "UPDATE Registration
              SET program = 'updated program'
                 where id In (100,101)";
                 try (Statement stmt3 = conn.create
                                  Statement ()){
            Stmt3-execute update (updateSQL);
            }
            String delete SQL = "DELETE FROM Registration
                  where id = 101");

                 }
                 catch (SQL Exception e) {
                       e.PrintStackTrace();
                  }}}
```

Experiment#			
Date		Student ID	
		Student Name	

- ✓ **Data and Results:**

The program successfully creates a database, inserts student records, displays them, updates data, and delete a record from database

- ✓ **Analysis and Inferences:**

The JDBC operations effectively demonstrates CRUD functionality, showcasing how servlets can manage databases records dynamically in a web application.

Experiment#			
Date		Student ID	
		Student Name	

VIVA-VOCE Questions (In-Lab):

1) What is the role of JDBC in Java database connectivity?

JDBC enables java applications to connect to databases, execute SQL series, and retrieve results for database interaction.

2) What are the different types of JDBC drivers? Explain their differences and advantages.

① JDBC-ODBC bridge

② Native-API

③ Network Protocal

④ Thin Drivers

Type 4 is most commonly used as it is plattform -independent and efficient

Experiment#			
Date		Student ID	
		Student Name	

3) How do you establish a database connection using JDBC?

Use Drivermanager.getConnection() with Connection URL, username, and password to establish a connection to database

4) Explain the difference between Statement and PreparedStatement in JDBC.

Statement is used for simple quires, while preparedstatement is precompiled, more secure, and efficient.

5) How do you handle exceptions related to database operations in JDBC? What are some common JDBC-related exceptions?

Use try-catch blocks to catch SQLException & handles database errors. Common exceptions include SQL SyntaxError Exception, SQLTimeout Exception, and SQL Integrity Constraint Violation Exception.

Post-Lab:

1) Write a JDBC program to Connect to a Database in PostgresqlServer. Hint: Create a "test" database in PostgreSQL server and check whether it is connected or not through JDBC Program (Display a message "Connected to the database" if username and password matched, otherwise display a message "Invalid username or password".)

Procedure/Program:

```
import java.sql.*;
  Public class Postgress JDBC{
   Public static void main (String[] args){
  String url;"jdbc:postgresql://local
           host:5432/test";
   String user ="your-name";
     String password ="your-pallword";
try Connection conn = Driver Manager
   get Connection(url, user, password)){
  System out Pointln ("connected to datab-
                  ase");
  }catch(SQLException e){
  System.out.Pointln ("Invalid esername
          (or pallword");
   }}
}
```

Experiment#			
Date		Student ID	
		Student Name	

✓ **Data and Results:**

The program successfully connects to the PostgreSQL 'test' database, displaying a success on error based on credentials

✓ **Analysis and Inferences:**

The JDBC connection handles authentication, ensuring that valid credentials are required for database access And Providing approite feedback.

Evaluator Remark (if Any):	**Marks Secured: _____out of 50**
	Signature of the Evaluator with Date

Evaluator MUST ask Viva-voce prior to signing and posting marks for each experiment.