

# Answer Key-Advanced Java- BIS402

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| Internal Assessment Test 2 – Set 3 – May 2026 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |  |           |  |           |  |            |  |        |  |                                                                                     |  |               |  |     |     |
| Sub:                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Advanced Java |  |           |  | Sub Code: |  | BIS402     |  | Branch |  | ISE                                                                                 |  |               |  |     |     |
| Date:                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 30/05/26      |  | Duration: |  | 90 min's  |  | Max Marks: |  | 50     |  | Sem/Sec:                                                                            |  | IV / A, B & C |  | OBE |     |
| Answer any FIVE questions                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |  |           |  |           |  |            |  |        |  |                                                                                     |  | MARKS         |  | CO  | RBT |
| 1                                             | <p>a. Write a Java program in swing event handling applications that creates 2 buttons ALPHA and BETA and displays the text “Alpha pressed” when alpha button is clicked and “Beta pressed” when beta button is clicked.</p> <p><b>Solution:</b></p> <pre>package Swing; import java.awt.*; import java.awt.event.*; import javax.swing.*;  public class EventDemo {     JLabel jlab;     EventDemo() {         //Create a new JFrame container.         JFrame jfrm = new JFrame("An Event Example");         //Specify FlowLayout for the layout manager.         jfrm.setLayout(new FlowLayout());         //Give the frame an initial size.         jfrm.setSize(220, 90);          //Terminate the program when the user closes the application.         jfrm.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);         //Make two buttons.         JButton jbbtnAlpha = new JButton("Alpha");         JButton jbbtnBeta = new JButton("Beta");         //Add action listener for Alpha.         jbbtnAlpha.addActionListener(new ActionListener() {             public void actionPerformed(ActionEvent ae) {                 jlab.setText("Alpha was pressed.");             }         });         //Add action listener for Beta.         jbbtnBeta.addActionListener(new ActionListener() {             public void actionPerformed(ActionEvent ae) {                 jlab.setText("Beta was pressed.");             }         });          //Add the buttons to the content pane.         jfrm.add(jbbtnAlpha);         jfrm.add(jbbtnBeta);         //Create a text-based label.         jlab = new JLabel("Press a button.");         //Add the label to the content pane.         jfrm.add(jlab);         //Display the frame.         jfrm.setVisible(true);     }      public static void main(String args[]) {          // Create the frame on the event dispatching thread.         SwingUtilities.invokeLater(new Runnable() {             public void run() {</pre> |               |  |           |  |           |  |            |  |        |  |                                                                                     |  | 6             |  | CO3 | L3  |
|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |  |           |  |           |  |            |  |        |  |                                                                                     |  | 4             |  |     |     |

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|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
|   | <pre>         new EventDemo();     }     }); } </pre> <p>b. Write short note on JButtons in Swing.</p> <p><b>Solution:</b><br/>         Swing defines four types of buttons: JButton, JToggleButton, JCheckBox, and JRadioButton. All are subclasses of the AbstractButton class, which extends JComponent. Thus, all buttons share a set of common traits.</p> <p><b>AbstractButton</b> contains many methods that allow you to control the behavior of buttons. For example, you can define different icons that are displayed for the button when it is disabled, pressed, or selected. Another icon can be used as a rollover icon, which is displayed when the mouse is positioned over a button. The following methods set these icons:</p> <pre> void setDisabledIcon(Icon di) void setPressedIcon(Icon pi) void setSelectedIcon(Icon si) void setRolloverIcon(Icon ri) </pre> <p>Here, di, pi, si, and ri are the icons to be used for the indicated purpose.</p> <p>The text associated with a button can be read and written via the following methods:</p> <pre> String getText( ) void setText(String str) </pre> <p>Here, str is the text to be associated with the button.</p> <p>The model used by all buttons is defined by the ButtonModel interface.</p>                                                                                                                                                                                                                            |    |     |    |
| 2 | <p>What are cookies? How are cookies handled in servlet? Write a java program to create and read a cookie with proper client and server side code.</p> <p><b>Solution:</b></p> <p><b>The Cookie Class</b></p> <ul style="list-style-type: none"> <li>• The Cookie class encapsulates a cookie. A cookie is stored on a client and contains state information. Cookies are valuable for tracking user activities.</li> <li>• For example, assume that a user visits an online store. A cookie can save the user's name, address, and other information. The user does not need to enter this data each time he or she visits the store.</li> <li>• A servlet can write a cookie to a user's machine via the addCookie() method of the HttpServletResponse interface. The data for that cookie is then included in the header of the HTTP response that is sent to the browser.</li> <li>• The names and values of cookies are stored on the user's machine. Some of the information that can be saved for each cookie includes the following:             <ul style="list-style-type: none"> <li>• The name of the cookie</li> <li>• The value of the cookie</li> <li>• The expiration date of the cookie</li> <li>• The domain and path of the cookie</li> </ul> </li> </ul> <p>There is one constructor for Cookie. It has the signature shown here:</p> <p><b>Cookie(String name, String value)</b></p> <p>Here, the name and value of the cookie are supplied as arguments to the constructor.</p> | 10 | CO4 | L2 |

### AddCookie.html

```
<!DOCTYPE html>

<html>

<body>

<center>

<form          name="Form1"                      method="post"
action="http://localhost:8080/Cookie/AddCookieServlet">

<B>Enter a value for MyCookie:</B>

<input type=textBox name="data" size=25 value="">

<input type=submit value="Submit button">

</form>

</body>

</html>
```

### AddCookieServlet.java

```
package Cookies;

import java.io.*;

import jakarta.servlet.*;

import jakarta.servlet.http.*;

public class AddCookieServlet extends HttpServlet {

    public void doPost(HttpServletRequest request,

        HttpServletResponse response)

        throws ServletException, IOException {

        // Get parameter from HTTP request.

        String data = request.getParameter("data");

        // Create cookie.

        Cookie cookie = new Cookie("MyCookie", data);

        // Add cookie to HTTP response.

        response.addCookie(cookie);

        // Write output to browser.

        response.setContentType("text/html");

        PrintWriter pw = response.getWriter();

        pw.println("<B>MyCookie has been set to");

        pw.println(data);
```

```

pw.close();
}
}
GetCookiesServlet.java

package Cookies;

import java.io.*;

import jakarta.servlet.*;

import jakarta.servlet.http.*;

public class GetCookiesServlet extends HttpServlet {

    public void doGet(HttpServletRequest request,

        HttpServletResponse response)

        throws ServletException, IOException {

        // Get cookies from header of HTTP request.

        Cookie[] cookies = request.getCookies();

        // Display these cookies.

        response.setContentType("text/html");

        PrintWriter pw = response.getWriter();

        pw.println("<B>");

        for(int i = 0; i < cookies.length; i++) {

            String name = cookies[i].getName();

            String value = cookies[i].getValue();

            pw.println("name = " + name + "; value = " + value);

        }

        pw.close();

    }

}

```

### **Web.xml**

```

<servlet>

<servlet-name>AddCookie</servlet-name>

<servlet-class>Cookie.AddCookieServlet</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>AddCookie</servlet-name>

```

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |     |    |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
|   | <pre> &lt;url-pattern&gt;/AddCookieServlet&lt;/url-pattern&gt;  &lt;/servlet-mapping&gt;  &lt;!-- GetCookiesServlet Mapping --&gt;  &lt;servlet&gt;  &lt;servlet-name&gt;GetCookies&lt;/servlet-name&gt;  &lt;servlet-class&gt;Cookie.GetCookiesServlet&lt;/servlet-class&gt;  &lt;/servlet&gt;  &lt;servlet-mapping&gt;  &lt;servlet-name&gt;GetCookies&lt;/servlet-name&gt;  &lt;url-pattern&gt;/GetCookiesServlet&lt;/url-pattern&gt; &lt;/servlet-mapping&gt; </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |     |    |
| 3 | <p>Write a java program for reading client parameters using servlet and display them by mentioning about doGet() and doPost() methods.</p> <p><b><u>Solution:</u></b></p> <p><b><u>Index.html</u></b></p> <pre> &lt;!DOCTYPE html&gt; &lt;html&gt; &lt;head&gt; &lt;meta charset="UTF-8"&gt; &lt;title&gt;Insert title here&lt;/title&gt; &lt;/head&gt; &lt;body&gt; &lt;form action="add" method="post"&gt; // &lt;form action="add" method="get"&gt; Enter 1st number: &lt;input type="text" name="num1"&gt;&lt;br&gt; Enter 2nd number: &lt;input type="text" name="num2"&gt;&lt;br&gt; &lt;input type="submit"&gt; &lt;/form&gt; &lt;/body&gt; &lt;/html&gt; </pre> <p><b><u>AddServlet.java</u></b></p> <pre> package servelet.com; import java.io.PrintWriter; import java.io.IOException; import javax.servlet.http.HttpServlet; import javax.servlet.http.HttpServletRequest; import javax.servlet.http.HttpServletResponse;  public class AddServlet extends HttpServlet {      public void service(HttpServletRequest req, HttpServletResponse res) throws IOException     {         int i=Integer.parseInt(req.getParameter("num1"));         int j=Integer.parseInt(req.getParameter("num2"));         int k=i+j;         PrintWriter out=res.getWriter();         out.println("The Result is :"+ k);     } } </pre> <p><b><u>Web.xml</u></b></p> | 10 |     |    |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | CO4 | L3 |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |     |    |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|----|
|   | <pre> &lt;?xml version="1.0" encoding="UTF-8"?&gt; &lt;web-app &gt;      &lt;servlet&gt;     &lt;servlet-name&gt;abc&lt;/servlet-name&gt;     &lt;servlet-class&gt;servelet.com.AddServelet&lt;/servlet-class&gt;     &lt;/servlet&gt;     &lt;servlet-mapping&gt;     &lt;servlet-name&gt;abc&lt;/servlet-name&gt;     &lt;url-pattern&gt;/add&lt;/url-pattern&gt;     &lt;/servlet-mapping&gt; &lt;/web-app&gt; </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |     |    |
| 4 | <p>a. Explain the various types of JSP Tags with example.</p> <p>JSP program consists of a combination of <b>HTML tags and JSP tags</b> that <b>define actions that is to be executed</b> before the output of the full program is sent to the browser.</p> <p>A JSP tag begins with</p> <p>"&lt;% " which is followed by Java code, and ends with "%&gt;".</p> <p><b>1.Directive Tags</b></p> <pre> &lt;%@ page import=" import java.sql.*" %&gt; &lt;%@ include file="keogh\books.html" %&gt; &lt;%@ taglib uri="myTags.tld" %&gt; </pre> <p><b>2.Expression tags</b></p> <p>An expression tag opens with &lt;%= and is used for an expression statement whose result replaces the expression tag when the JSP virtual engine resolves ISP tags. An expression tags closes with %&gt;.</p> <p><b>3.Scriptlet tags</b></p> <p>A scriptlet tag opens with &lt;% and contains commonly used Java control statements and loops. A scriptlet tag ends with %&gt;.</p> <p><b>4.Declaration tags</b></p> <pre> &lt;%!   int value=1;   %&gt; </pre> <p>b. What are sessions? How are sessions handled in JSP? Write proper code snippets.<br/> <b>Solution:</b><br/> <u><b>Session Tracking</b></u></p> <p>c. HTTP is a stateless protocol. Each request is independent of the previous one.</p> | 4<br>6 | CO4 | L3 |

- d. However, in some applications, it is necessary to save state information so that information can be collected from several interactions between a browser and a server. Sessions provide such a mechanism.
- e. A session can be created via the getSession() method of HttpServletRequest. An HttpSession object is returned.
- f. This object can store a set of bindings that associate names with objects. The setAttribute(), getAttribute(), getAttributeNames(), and removeAttribute() methods of HttpSession manage these bindings.
- g. Session state is shared by all servlets that are associated with a client.
- h. The getSession() method gets the current session. A new session is created if one does not already exist.
- i. The getAttribute() method is called to obtain the object that is bound to the name "date".

#### **DateServlet.Java**

```

package Session;
java.io.*;
import java.util.*;

import jakarta.servlet.*;

import jakarta.servlet.http.*;

public class DateServlet extends HttpServlet {

    public void doGet(HttpServletRequest request,
        HttpServletResponse response)
        throws ServletException, IOException {

        // Get the HttpSession object.

        HttpSession hs = request.getSession(true);

        // Get writer.

        response.setContentType("text/html");

        PrintWriter pw = response.getWriter();

        pw.print("<B>");

        // Display date/time of last access.

        Date lastAccessTime = (Date) hs.getAttribute("lastVisit");

        if (lastAccessTime != null) {

```

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |    |     |    |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
|   | <pre> pw.println("Last access: " + lastAccessTime + "&lt;br&gt;");  }  // Store current time with the key "lastVisit"  Date currentTime = new Date();  hs.setAttribute("lastVisit", currentTime);  pw.println("Current date: " + currentTime); </pre> <p><b>web.xml</b></p> <pre> &lt;?xml version="1.0" encoding="UTF-8"?&gt; &lt;web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="https://jakarta.ee/xml/ns/jakartaee" xsi:schemaLocation="https://jakarta.ee/xml/ns/jakartaee https://jakarta.ee/xml/ns/jakartaee/web-app_6_0.xsd" id="WebApp_ID" version="6.0"&gt; &lt;servlet&gt; &lt;servlet-name&gt;Session Tracking&lt;/servlet-name&gt; &lt;servlet-class&gt;Session.DateServlet&lt;/servlet-class&gt; &lt;/servlet&gt; &lt;servlet-mapping&gt; &lt;servlet-name&gt;Session Tracking&lt;/servlet-name&gt; &lt;url-pattern&gt;/track-session&lt;/url-pattern&gt; &lt;/servlet-mapping&gt; &lt;/web-app&gt; </pre>                                                                         |    |     |    |
| 5 | <p>List and explain various statement objects in JDBC with detailed steps and code snippets.</p> <p><b>Statement objects</b></p> <p>Once the connection to the database is opened,Java application creates and sends a query to access data contained in the database.</p> <p>Three type of statement objects:</p> <ul style="list-style-type: none"> <li>• Statement Object: Executes a query immediately</li> <li>• PreparedStatement Object: Executes a compiled query</li> <li>• CallableStatement Object: Executes a storedprocedure:</li> </ul> <p><b>The Statement Object:</b></p> <p>Statement object is used whenever a Java program needs to immediately execute a query without first having query compiled</p> <p>Three different methods available</p> <p><b>executeQuery()</b></p> <p>This method returns the ResultSet object that contains rows, columns and metadata that represent data requested by the query.</p> <p>Generally, this method is used to execute only the 'SELECT' query of SQL</p> | 10 | CO5 | L2 |

Method Signature:

**ResultSet executeQuery(String query);**  
**executeUpdate():**

This method is used to execute the queries that contain INSERT, DELETE and UPDATE statements. Method returns integer indicating the number of rows that were updated by the query.

Signature: `int executeUpdate(String query);`

For example:

```
int rows = st.executeUpdate("DELETE FROM EMPLOYEES WHERE STATUS=0");  
execute():
```

This method is used to execute SQL statement which may return multiple results.

Signature :

**public boolean execute(String sql)**

For example:

```
if(st.execute())
```

```
rs = st.getResultSet();
```

Signatures of other methods:

```
public ResultSet getResultSet()
```

```
public int getUpdateCount()
```

```
public boolean getMoreResults()
```

## 2. **PreparedStatement object:**

- SQL query must be compiled before the DBMS processes it. Compiling done after Statement object's execution method is called. Compiling a query is an overhead that is acceptable if the query is called once. Compiling can become an expensive overhead if the query is executed several times by the same program during the same session.
- PreparedStatement object can be used to precompile and execute SQL query

Query is created similar to other queries. However, a question mark is given on the place for the value that is inserted into the query after it is compiled. It is the value that changes each time the query is executed

For example

**"select \* from nation where population > ?"**

Once the PreparedStatement object is obtained, the `setXxx()` methods are used to replace question mark with the value passed to `setXxx()` method. `setXxx()` method specifies the data type of value that is being passed

For example

```
ps.setInt(1, 100000);
```

First parameter (int--identifies position of the question mark placeholder)

## 3. **CallableStatement Object**

CallableStatement - used to call stored procedures from JDBC application program.

Stored procedure - block of code identified by a unique name (can be written in PL/SQL, Transact-SQL, C, etc)

CallableStatement object uses three types of parameters when calling a stored procedure

### **IN, OUT, INOUT**

IN parameter contains the data that needs to be passed to the stored procedure whose value is assigned using setXxx() method

OUT parameter contains the value returned by the stored procedure, if any

IN,OUT parameter is a single parameter that is used to both pass information and retrieve information from a stored procedure

Create a stored procedure in mysql

```
DELIMITER //
```

```
CREATE PROCEDURE insertStudent(IN sid INT,IN sname VARCHAR(30))
```

```
BEGIN
```

```
INSERT INTO students VALUES(sid, sname);
```

```
END
```

```
//DELIMITER ;
```

show procedure status where db='student\_db';

### **Execute the java program**

```
import java.sql.*;
public class CallableDemo
{
    public static void main(String args[])
    {
        try
        {
            // Step 1: Load JDBC Driver
            Class.forName("com.mysql.cj.jdbc.Driver");
            // Step 2: Create Connection
            Connection con =
            DriverManager.getConnection(
            "jdbc:mysql://localhost:3306/jdbcdb",
            "root",
            "password");
            // Step 3: Create CallableStatement
            CallableStatement cs =
            con.prepareCall("{call insertStudents(?, ?)}");
            // Step 4: Set Procedure Parameters
            cs.setInt(1, 1001);
            cs.setString(2, "John");
            // Step 5: Execute Procedure
            cs.execute();
            System.out.println("Record Inserted Successfully");
            // Step 6: Close Resources
            cs.close();
            con.close();
        }
        catch (Exception e)
        {
            e.printStackTrace();
        }
    }
}
```

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |     |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|----|
|   | }                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |     |    |
|   | <p>a. Demonstrate in detail the concept of Transaction processing with code snippets.</p> <p><b>Solution:</b></p> <p><b>Transaction Processing</b></p> <p>A transaction may involve several tasks similar to the tasks that are required to complete a transaction at a supermarket) .In a supermarket transaction, each item purchased must be registered, the transaction must be totaled, and the customer must tender the amount of the purchase. The transaction is successfully completed only if each task is completed successfully. If one task fails, the entire transaction fails. Previously completed tasks must be reversed if the transaction fails.</p> <p>For example, goods that were registered must be removed from the register and returned to the shelf.</p> <ul style="list-style-type: none"> <li>• A database transaction consists of a set of SQL statements, each of which must be successfully completed for the transaction to be completed. If one fails, SQL statements that executed successfully up to that point in the transaction must be rolled back.</li> <li>• A database transaction isn't completed until the J2EE component calls the commit() method of the Connection object. All SQL statements executed prior to the call to the commit() method can be rolled back. However, once the commit() method is called, none of the SQL statements can be rolled back.</li> <li>• The commit() method must be called regardless if the SQL statement is part of a transaction or not. However, the commit() method was automatically called in these examples because the DBMS has an AutoCommit feature that is by default set to true.</li> <li>• If a J2EE component is processing a transaction, the AutoCommit feature must be deactivated by calling the setAutoCommit() method and passing it a false parameter</li> <li>• Once the transaction is completed, the setAutoCommit() method is called again.</li> </ul> |        |     |    |
| 6 | <p>Listing 6-19 illustrates how to process a transaction. The transaction this example consist of two SQL statements, both of which update the Street address of rows in Customer table. Each SQL statement is executed separately and then the commit() method called. However, should either SQL statement throw an SQL exception, the catch{} block reacts by rolling back the transaction before displaying the exception on the screen.</p> <p>Listing 6-19</p> <pre>import java.sql.*; public class TransactionExample {     public static void main(String[] args) {         String url = "jdbc:odbc:CustomerInformation";         String userID = "Jim";         String password = "keogh";          Connection con = null;          try {              Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");              con = DriverManager.getConnection(url, userID, password);              con.setAutoCommit(false);              Statement stmt1 = con.createStatement();             Statement stmt2 = con.createStatement();              String query1 =                 "UPDATE Customers SET Street='5 Main Street' " +                 "WHERE FirstName='Bob'";             String query2 =                 "UPDATE Customers SET Street='10 Main Street' " +                 "WHERE FirstName='Tim'";</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6<br>4 | CO5 | L2 |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
|  | <pre>stmt1.executeUpdate(query1); stmt2.executeUpdate(query2);  con.commit();  System.out.println("Transaction Successful");  stmt1.close(); stmt2.close(); con.close();  } catch (Exception ex) {     System.out.println("Error: " + ex.getMessage());      try {         if (con != null) {             con.rollback();             System.out.println("Transaction Rolled Back");         }     }     catch (SQLException e) {         System.out.println(e.getMessage());     } } }</pre> <p>j. Write short note on Datatypes in JDBC.</p> <p><b>Solution:</b></p> <ul style="list-style-type: none"><li>• The <b>setxxx()</b> and <b>getxxx()</b> methods are used to set a value of a specific data type and to retrieve a value of a specific data type. The xxx in the names of these methods is replaced with the name of the data type.</li></ul> |  |  |  |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|

| SQL Type      | Java Type            |
|---------------|----------------------|
| CHAR          | String               |
| VARCHAR       | String               |
| LONGVARCHAR   | String               |
| NUMERIC       | java.math.BigDecimal |
| DECIMAL       | java.math.BigDecimal |
| BIT           | Boolean              |
| TINYINT       | Byte                 |
| SMALLINT      | Short                |
| INTEGER       | Integer              |
| BIGINT        | Long                 |
| REAL          | float                |
| FLOAT         | float                |
| DOUBLE        | double               |
| BINARY        | Byte[]               |
| VARBINARY     | Byte[]               |
| LONGVARBINARY | byte[]               |
| BLOB          | java.sql.Blob        |
| CLOB          | java.sql.Clob        |
| ARRAY         | java.sql.Array       |
| STRUCT        | java.sql.Struct      |
| REF           | java.sql.Ref         |
| DATALINK      | java.sql.Types       |
| DATE          | java.sql.Date        |
| TIME          | java.sql.Time        |
| TIMESTAMP     | java.sql.Timestamp   |

**Table 6-1.** A List of Data Types for Use with the setxxx() and getxxx() Methods

Faculty Signature

CCI Signature

HOD Signature