◆ Q.1: Attempt the following (True/False) [10 Marks]

J2EE (5 Marks)

1. JDBC stands for Java Database Connectivity. ✅ **True**

2. `PreparedStatement` is used to execute precompiled SQL queries. ✅ **True**

3. A Servlet's `init()` method is called every time a request is received. ❌ **False** (Called once at initialization)

4. JSP stands for Java Servlet Page. ❌ **False** (Correct: JavaServer Pages)

5. Cookies can only store numeric values. ❌ **False** (They can store strings too)

Python (5 Marks)

6. In Python, list is mutable and tuple is immutable. ✅ **True**

7. `lambda` keyword is used to define anonymous functions. ✅ **True**

8. Dictionary stores values in an ordered sequence by default. ❌ **False** (Unordered till 3.6, ordered from 3.7)

9. `open("file.txt", "w")` mode is used to read a file. ❌ **False** (It is used to write)

10. Python uses indentation to define code blocks. ✅ **True**

◆ Q.2: Fill in the blanks (10 Marks)

J2EE (5 Marks)

1. JDBC is used to connect _____ with Java. (Database)
2. The lifecycle methods of a servlet are `init()`, `____`, and `destroy()`. (service())
3. In JSP, `<% %>` is used for _____ scripting. (Java code)
4. A `____` statement is used for calling stored procedures. (CallableStatement)
5. Session tracking in Servlet can be done using _____. (Cookies / HttpSession)

Python (5 Marks)

6. The keyword used to define a function in Python is _____. (`def`)
7. `____` operator is used for floor division in Python. (`//`)
8. Strings in Python are _____ (mutable / immutable). (Immutable)
9. The default return value of a Python function is _____. (`None`)
10. In Python, `____` is used to handle exceptions. (`try-except`)

Q.3: J2EE Program (10 Marks)

Choice 1: Write a JDBC program to insert a record into the employee table.

```java
import java.sql.*;


public class InsertEmployee {

    public static void main(String[] args) {

        try {

            Class.forName("com.mysql.cj.jdbc.Driver");

        Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/testdb","root","password");

 String query = "INSERT INTO emp(empno, empname, designation, city, salary, department) VALUES(?,?,?,?,?,?)";

            PreparedStatement ps = con.prepareStatement(query);

            ps.setInt(1, 101);

            ps.setString(2, "Raj");

            ps.setString(3, "Manager");

            ps.setString(4, "Surat");

            ps.setDouble(5, 50000);

            ps.setString(6, "HR");


            int i = ps.executeUpdate();

            System.out.println(i + " record inserted.");


            con.close();

        } catch (Exception e) {

            e.printStackTrace();

        }

    }

}
```

Choice 2: Write a Servlet that displays the current date and time.

```java
import java.io.*;

import java.util.*;

import javax.servlet.*;

import javax.servlet.http.*;



public class DateTimeServlet extends HttpServlet {

    public void doGet(HttpServletRequest req, HttpServletResponse res) throws IOException {

        res.setContentType("text/html");

        PrintWriter out = res.getWriter();

        Date date = new Date();

        out.println("<h2>Current Date and Time: " + date.toString() + "</h2>");

    }

}
```

◆ Q.4: J2EE Program (5 Marks)

Choice 1: Write a JSP page to print "Hello World".

```jsp
<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8" %>

    <html>

    <body>

        <h2>HEllo WORLD</h2>

        <% out.println("Hello World from JSP"); %>

    </body>

    </html>
```

Choice 2: Write a program to update a record of a student using PreparedStatement.

```java
import java.sql.*;


public class UpdateStudent {

    public static void main(String[] args) {

        try {

            Class.forName("com.mysql.cj.jdbc.Driver");

            Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/testdb","root","");


            String query = "UPDATE stud SET course=? WHERE rollno=?";

            PreparedStatement ps = con.prepareStatement(query);

            ps.setString(1, "MCA");

            ps.setInt(2, 1);


            int i = ps.executeUpdate();

            System.out.println(i + " record updated.");


            con.close();

        } catch (Exception e) {

            e.printStackTrace();

        }

    }

}
```

◆ Q.5: Python Program (10 Marks)

Choice 1: Write a Python program to check whether a number is Armstrong or not.

```python
num = int(input("Enter a number: "))

sum = 0

temp = num

while temp > 0:

digit = temp % 10

sum += digit ** 3

temp //= 10


if num == sum:

print(num, "is an Armstrong number")

else:

print(num, "is not an Armstrong number")
```

Choice 2: Write a Python program to copy the contents of one file into another file.

```python
#Create and write to the source file

src = open("source.txt", "w")

src.write("This is the original file.\nIt will be copied to another file.")

src.close()


#Read from source file

src = open("source.txt", "r")

data = src.read()

src.close()


#Write data to destination file

dest = open("copy.txt", "w")

dest.write(data)

dest.close()


print("File copied successfully!")
```

◆ Q.6: Python Program (5 Marks)

Choice 1: Write a Python program to compute factorial of a number using recursion.

```python
def factorial(n):

    if n == 0 or n == 1:

        return 1

    else:

        return n * factorial(n-1)


num = int(input("Enter a number: "))

print("Factorial:", factorial(num))
```

Choice 2: Write a Python program to count frequency of characters in a given string.

```python
string = input("Enter a string: ")

freq = {}

for char in string:

    freq[char] = freq.get(char, 0) + 1

print("Character frequencies:", freq)
```

SUB: J2EE

Q-1) Answer the following (05)

1. (method) is used to print any text in browser.
   Ans: `out.println()` (via `PrintWriter out = response.getWriter();`)

2. Which method is used to execute DQL query?
   Ans: `executeQuery()`

3. "404 Page not found" is server generated error. (true/false)
   Ans: True (server responds with HTTP 404 to the client)

4. `executeUpdate()` returns _____ ?
   Ans: `int` (number of rows affected; 0 for DDL/no rows)

5. Define syntax of `Class.forName()` method.
   Ans: `Class.forName("com.mysql.cj.jdbc.Driver");` // loads MySQL JDBC driver

2) Servlet: Print "Welcome <username>" on submit

```html
<!-- Form (welcome.html) -->

<form action="welcome" method="post">

    <input type="text" name="username" placeholder="Enter name">

    <button type="submit">Submit</button>

</form>
```

```java
// Servlet (WelcomeServlet.java)

import java.io.*;

import javax.servlet.*;

import javax.servlet.http.*;


    public class WelcomeServlet extends HttpServlet

    {

    public void doPost(HttpServletRequest req, HttpServletResponse res) throws IOException

    {

    res.setContentType("text/html");

    PrintWriter out = res.getWriter();

    String uname = req.getParameter("username");

    out.println("<h2>Welcome " + uname + "</h2>");

    }

}
```

3) Servlet block: display students detail from table students (JDBC – Statement)

```java
import java.io.*;

import javax.servlet.*;

import javax.servlet.http.*;

import java.sql.*;


public class StudentServlet extends HttpServlet {

    public void doGet(HttpServletRequest req, HttpServletResponse res) throws IOException {

        res.setContentType("text/html");

        PrintWriter out = res.getWriter();

        try {

            Class.forName("com.mysql.cj.jdbc.Driver");

            Connection con = DriverManager.getConnection(

                "jdbc:mysql://localhost:3306/harshal_jee","root","");

            Statement st = con.createStatement();

            ResultSet rs = st.executeQuery("SELECT rollno, name, percentage FROM students");

            out.println("<table border='1'><tr><th>RollNo</th><th>Name</th><th>%</th></tr>");

            while (rs.next()) {

                out.println("<tr><td>"+rs.getInt(1)+"</td><td>"+rs.getString(2)+

                            "</td><td>"+rs.getDouble(3)+"</td></tr>");

            }

            out.println("</table>");

            con.close();

        } catch(Exception e){ out.println(e); }

    }

}
```

5) Display name of student who has highest percentage (CallableStatement)

```sql
// (MySQL stored procedure — run once)

DELIMITER

CREATE PROCEDURE get_highest_student()

BEGIN

    SELECT name, percentage FROM students ORDER BY percentage DESC LIMIT 1;

END

DELIMITER ;
```

```java
// callable_.java

import java.sql.*;

public class HighestStudent {

  public static void main(String[] args) throws Exception {

    Class.forName("com.mysql.cj.jdbc.Driver");

    Connection con = DriverManager.getConnection(

        "jdbc:mysql://localhost:3306/harshal_jee","root","");

    CallableStatement cs = con.prepareCall("{call get_highest_student()}");

    ResultSet rs = cs.executeQuery();

    if (rs.next())

      System.out.println("Topper: " + rs.getString("name") +" - " + rs.getDouble("percentage") + "%");

    con.close();

  }

}
```

6) Servlet: perform arithmetic operations

```html
// Form (calc.html)

<form action="calculator_logic" method="post">

  <input type="number" name="a" required>

  <input type="number" name="b" required>

  <button type="submit">Calculate</button>

</form>
```

```java
// Servlet (calculator_logic.java)

import java.io.*;

import javax.servlet.*;

import javax.servlet.http.*;

public class calculator_logic extends HttpServlet {

  public void doPost(HttpServletRequest req, HttpServletResponse res) throws IOException {

    res.setContentType("text/html"); PrintWriter out = res.getWriter();

    int a = Integer.parseInt(req.getParameter("a"));

    int b = Integer.parseInt(req.getParameter("b"));

    out.println("Addition: " + (a+b) + "<br>");

    out.println("Subtraction: " + (a-b) + "<br>");

    out.println("Multiplication: " + (a*b) + "<br>");

    out.println("Division: " + (b!=0 ? (a/b) : "undefined") + "<br>");

  }

}
```

SUB: PYTHON

Q-1) Answer the following (05)

1. List out string methods available in Python.
   lower(), upper(), title(), capitalize(), casefold(), swapcase(), strip()/lstrip()/rstrip(),
   replace(), find(), index(), count(), startswith(), endswith(), split(), rsplit(), join(),
   partition(), rpartition(), center(), ljust(), rjust(), zfill(), isalpha(), isdigit(), isalnum(),
   islower(), isupper(), istitle(), isspace().

2. _____ is a function that is used to take input from user.
   Ans: input()

3. What is use of from and import keyword?
   Ans: import module brings a whole module; from package_or_module import name1, name2 imports specific names.

4. List out membership and identity operators.
   Ans: Membership → in, not in; Identity → is, is not.

5. What is use of type and help function?
   Ans: type(obj) returns the object's type; help(obj) shows documentation/help for object/module.

Q-2) Answer the following (Write code)

Count total number of vowels in string

```python
s = input("Enter string: ")

v = set("aeiouAEIOU")

count = sum(1 for ch in s if ch in v)

print("Vowel count:", count)
```

Greatest among three numbers (user input)

```python
a = float(input("A: "))

b = float(input("B: "))

c = float(input("C: "))

print("Greatest:", max(a, b, c))
```

Positional & keyword argument function emp_detail(role, skills, info)

```python
def emp_detail(role, skills, info):

    print("Role:", role)

    print("Skills:", skills)

    print("Info:", info)


# call with positional + keyword

emp_detail("Developer", ["Python","SQL"], info={"name":"Harshal","sem":5})
```

Demonstrate string methods (any five)

```python
s = "  hello bca  "

print(s.strip())                     # remove spaces

print(s.upper())                     # to upper

print(s.replace("bca","students"))

print("Position of 'bca':", s.find("bca"))

print("-".join(["hello","bca","students"]))
```

Write "hello bca students" to a file & read it back

```python
with open("msg.txt","w") as f:

    f.write("hello bca students")

with open("msg.txt","r") as f:

    print(f.read())
```