

**ADVANCED JAVA PROGRAMMING  
(CSEN 3283)**

Time Allotted : 3 hrs

Full Marks : 70

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and  
any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group - A  
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) What are the annotations used for session bean development in EJB 3.0?  
 (a) @Stateless, @Stateful, @Singleton, @Override  
 (b) @Stateless, @Stateful, @Singleton  
 (c) @Stateless, @Stateful  
 (d) @Singleton, @Override.
- (ii) When doPost() method of servlet gets called?  
 (a) A POST request results from an HTML form that specifically lists POST as the METHOD.  
 (b) The service() method checks the HTTP request type as POST and calls doPost() method.  
 (c) Both of the above.  
 (d) None of the above.
- (iii) How can you retrieve information from a ResultSet?  
 (a) By invoking the method get (... , String type) on the ResultSet, where type is the database type  
 (b) By invoking the method get (... , Type type) on the ResultSet, where Type is an object which represents a database type  
 (c) By invoking the method getValue (...), and cast the result to the desired Java type.  
 (d) By invoking the special getter methods on the ResultSet: getString (...), getBoolean (...), getClob (...),...
- (iv) What is javax.servlet.Servlet?  
 (a) Interface (b) Abstract class  
 (c) Concrete class (d) None of the above.

- (v) Which of the following describes the correct sequence of the steps involved in making a connection with a database. 1. Loading the driver 2. Process the results. 3. Making the connection with the database. 4. Executing the SQL statements?  
 (a) 1,3,4,2 (b) 1,2,3,4 (c) 2,1,3,4 (d) 4,1,2,3.
- (vi) Given a JSP page with the line:  
 $\${101 \% 10}$   
 The output is:  
 (a) 1 (b) 10 (c) 1001 (d) 101 % 10.
- (vii) What is the purpose of the destroy() method in servlet lifecycle?  
 (a) To perform cleanup activities like write hit counts to disk  
 (b) Destroy the servlet instance from memory  
 (c) Servlet instance is marked for garbage collection  
 (d) Both (a) and (c).
- (viii) In a JSP page you have included a file. You want that the changes in that file will not be reflected in JSP page. What type of tag you want to use?  
 (a) Include action tag  
 (b) Include directive tag  
 (c) Either use include action or directive tag  
 (d) Impossible to implement this behavior.
- (ix) What is the initial contact point for handling a web request in a Page-centric architecture?  
 (a) A JSP page (b) A JavaBean  
 (c) A Servlet (d) A session Manager.
- (x) Each CGI request \_\_\_\_\_ process.  
 (a) always uses existing (b) may or may not create a new  
 (c) always creates a new (d) does not create a new.

**Group - B**

2. (a) What is Application Server? Name at least 3 application servers implementing JEE.  
 (b) What is MVC Architecture? Explain the functions of each element of MVC.  
 (c) Explain Model 2 (MVC) Architecture with a schematic diagram. What are the advantages and disadvantages of this model over Model 1 (MVC) Architecture?  
**2 + 4 + 6 = 12**
3. (a) What is the difference between a Web Server, a Web Container and a Java EE Connector?  
 (b) How Web Client, HTTP Client and Web Server serve in J2EE architecture?  
 (c) What makes J2EE suitable for distributed multi-tiered Applications?  
**(2 + 2 + 2) + 2 + 4 = 12**

**Group - C**

4. (a) What is the difference between HTTP Servlet and Generic Servlet?  
 (b) What is Servlets container? What role does it play? Briefly define different containers available in Servlets.

**4 + (2 + 2 + 4) = 12**

5. (a) What are the different kinds of enterprise beans?  
 (b) Which of the beans available in EJB 3 are only called by clients? What type of bean you should use to receive messages asynchronously?  
 (c) Write down at least five benefits of EJB technology?  
 (d) What is the purpose of home interface in EJB? Who implements the home interface?  
 (e) You need to develop a web application which will interact with a session bean. The remote interface of the session bean contains following two methods:  
 String getCreditLimit(String acNo) and String getAcType(String acNo)  
 Write the code for remote interface and the stateless session bean which implements that interface using appropriate annotations available in EJB 3.1. Import appropriate packages needed for this purpose.

**2 + 1 + 2 + 2 + 5 = 12**

**Group - D**

6. (a) Name all types of driver available in JDBC. Which one is widely used now a days? What are the advantages of such type of driver?  
 (b) What is the purpose of the statement "int executeUpdate (String SQL)" used in JDBC programming? Can you access the records of a table using above statement? If not, what statement you should use for that purpose.  
 (c) Write a java program to access all student records stored in a Student Table in MySQL database and display them. Write appropriate comments for each step in the program. Assume that each record contains rollno (integer), name (string) and age (integer).

**3 + 3 + 6 = 12**

7. (a) What are the five elements provided by Java RMI?  
 (b) Describe the tasks performed by stub in RMI application.  
 (c) Develop a server program in a RMI application which will implement the following remote interface.  
 public interface **Aadhar** extends Remote {  
     String chkAadhar(String adrno) throws RemoteException;  
 }

The method chkAadhar will take Aadhar no as input and if it starts with 9 and total number of character is 10 it returns "OK" otherwise returns "Incorrect Aadhar No".

- (d) What is the purpose of serialization in Java in RMI context?

**2 + 3 + 6 + 1 = 12**

**Group - E**

8. (a) What do you mean by well-formed XML document? Write some advantages and disadvantage of XML format with respect to other format of data transfer.  
 (b) You have to send following bank account information in an XML document. Write a program to read this XML file using DOM or SAX parser and generate output as "Account Holder Name : Suman Sasmal, Balance : 125675".

XML document : **account.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<bank>
```

```
  <account id="1">
```

```
    <bankaccountno>125675</bankaccountno>
```

```
    <acholdername>Suman Sasmal</acholdername>
```

```
    <balance>54390</balance>
```

```
  </account>
```

```
</bank>
```

**(1 + 3) + 8 = 12**

9. (a) Create an XML document that describes your details in the following hierarchy:

**Name:** LastName

    FirstName

    MiddleName

**Age:** Years

    Months

**Address:** Country

    State

    City

    Pin

**Phone:** CountryCode

    AreaCode

    PhoneNumber

- (b) Write an XSL to display the details of the above XML document.

**6 + 6 = 12**