Subject Code:- **AMICSE0601**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech. (Integrated)

SEM: VI - THEORY EXAMINATION- (20.. - 20....)

Subject: Advanced Java Programming

Time: 3 Hours   **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

*1. This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A   20

1. Attempt all parts:-

1-a.   Stored procedure can be called by : (CO1, K1)   1

    (a)   Statement

    (b)   PreparedStatement

    (c)   CallableStatment

    (d)   CalledStatement

1-b.   Method used to perform DML statements in JDBC is : (CO1, K1)   1

    (a)   executeResult()

    (b)   executeQuery()

    (c)   executeUpdate()

    (d)   execute()

1-c.   Choose one Implicit Object which is used to get information about the servlet configuration? (CO2,K1)   1

    (a)   page

    (b)   config

    (c)   application

    (d)   out

1-d.   The following implicit Object is used to get information about the client. (CO2,K2)   1

    (a)   request

(b)   response

(c)   out

(d)   application

1-e.   The annotation do we use to mark the class as a Service class/component.   1
         (CO3,K1)

(a)   @Component

(b)   @Service

(c)   @Controller

(d)   @Repository

1-f.   Select the design pattern implemented by the JdbcTemplate class. (CO3, K2)   1

(a)   Singleton design pattern

(b)   Strategy design pattern

(c)   Template Design pattern

(d)   Decorator design pattern

1-g.   Repository class has to extend _____ class to get the implementation benefit of   1
         Spring Data. (CO4, K3)

(a)   CrudRepository

(b)   CrudRep

(c)   No Class needs to extended

(d)   CrudRepositoryTest

1-h.   Form tag used to display error messages in JSP when a field fails validation.   1
         (CO4, K3)

(a)   form:errors

(b)   form:invalid

(c)   form:valid

(d)   form:input

1-i.   A superclass is defined as an object without a matching database table in ____   1
         Inheritance, and its attributes and mappings are inherited by its subclasses. (CO5,
         K3)

(a)   Table per class strategy

(b)   Joined table strategy

(c)   Single table strategy

(d)   Mapped Superclass

1-j.   Choose the attribute of @OneToMany annotation is used to mark an entity as   1
         owned in a bidirectional relationship (CO5,K3)

(a)   mappedBy

(b)   cascade

(c)   fetch

(d)   Orphanremoval

2. Attempt all parts:-

2.a.   Discuss the differences between PrintWriter and ServletOutputStream. (CO1, K2)   2

2.b.   Interpret the concepts of initialization phase in the JSP life cycle.(CO2 ,K 2)   2

2.c.   Discuss the benefits of using Spring Tool Suite. (CO3,K2)   2

2.d.   Is it possible to change the port of the embedded Tomcat server in Spring Boot?   2
         Mention the steps to do so. (CO4, K2)

2.e.   Dsicuss about the constraints on an entity class? (CO5,K2)   2

SECTION-B   30

3. Answer any <u>five</u> of the following:-

3-a.   Compare the use of annotations and XML-based configuration in servlet   6
         development. (CO1, K3)

3-b.   Describe how HttpSession manages user sessions, covering session creation,   6
         attribute management, and invalidation. (CO1, K3)

3-c.   Develop a JSP program for session tracking.(CO 2,K 3)   6

3-d.   Builda JSP program to retrieve data from HTML into JSP page and display on   6
         browser.(CO2,K3)

3-e.   Differentiate between a Bean Factory and an Application Context with example.   6
         (CO3, K3)

3.f.   Explain with architecture diagram of spring Model View and Controller.(CO4 ,K2   6
)

3.g.   Distinguish between the advantages of using JPA over JDBC.(CO5 ,K4)   6

SECTION-C   50

4. Answer any <u>one</u> of the following:-

4-a.   Describe the Transaction Management in JDBC and why do we need it?(CO1,K2)   10

4-b.   Case Study: 10
         A web-based survey system collects user responses and saves them for analysis.
         Users submit responses, and the system should process the data dynamically.

         Programming Task:
         Develop a servlet that:

         Retrieves user input from an HTML form.
         Stores the responses in a database using PreparedStatement.
         Displays survey statistics by retrieving data from the database.
         Uses ServletContext to store the total number of survey participants.   (CO1, K4)

5. Answer any <u>one</u> of the following:-

5-a.   Develop a JSP program to Print current date & time.(CO2 ,K 3)   10

5-b.   Build a JSP application that uses the JSP directive tag to include an external   10
         resource file. Your application should include a JSP file that contains the JSP
         directive tag and a separate text file that contains the content to be included. Write

.

a brief report on the steps you followed to create the application, including details on the JSP life cycle and the various JSP directive tags used in the application. (CO2, K4)

6. Answer any <u>one</u> of the following:-

6-a.   Demonstrate CRUD(create, read, update, delete) operation on a database table using java spring. (CO3,K3)   10

6-b.   Scenario: The student management system must now support editing and removing student information.   10
Task: Use Spring's JdbcTemplate to perform update and delete operations on the Student table.
Show the simplicity and efficiency of using JdbcTemplate for database operations. (CO3, K4)

7. Answer any <u>one</u> of the following:-

7-a.   Differntiate between Spring, Spring MVC, and Spring Boot.(CO4 ,K4)   10

7-b.   Create a employee database with fields empname,empid, salary, empdept. In MYSQL and write its connection file i.e. SpringBootJdbcApplication.java and SpringBootJdbcController.java.(CO4 ,K 3)   10

8. Answer any <u>one</u> of the following:-

8-a.   Decode a program to implement JPA inheritance(CO5 ,K 4)   10

8-b.   Create a JPA-based system for user registration and login functionality. Define the User entity with fields like id, username, password, email, and relationships with Role entities. Implement data validation for user input (e.g., check for existing username) and persistence to the database. Provide the Java code for registering and authenticating users, including the necessary JPA annotations. (CO5, K6)   10