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.*

<div align="center">

SECTION A   **20**

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1. Attempt all parts:-

1-a.   Select the true statement about javax.servlet.error.message. (CO1)   1

(a) This attribute gives exact error message which can be stored and analysed after storing in a java.lang.String data type.

(b) This attribute gives information about exception type which can be stored and analysed after storing in a java.lang.Class data type.

(c) This attribute gives status code which can be stored and analysed after storing in a java.lang.Integer data type.

(d) This attribute gives information about URL calling the servlet and it can be stored and analysed after storing in a java.lang.String data type.

1-b.   Choose the correct option when the Destroy() method of a filter is called(CO1)   1

(a) The destroy() method is called only once at the end of the life cycle of a filter

(b) The destroy() method is called after the filter has executed doFilter method

(c) The destroy() method is called only once at the begining of the life cycle of a filter

.

(d) The destroyer() method is called after the filter has executed

| 1-c. | Phases are in the life cycle of a JSP page (CO2) | 1 |

       (a) 2

       (b) 3

       (c) 4

       (d) 5

| 1-d. | The following is not true about JSP declaration tag (CO2) | 1 |

       (a) It can be used to declare variables and methods

       (b) It can be used to write Java code

       (c) It can be used to output data to the web page

       (d) It can be used to include external files in JSP

| 1-e. | The Spring annotation is used to inject the Spring bean (CO3) | 1 |

       (a) @Bean

       (b) @Autowired

       (c) @Service

       (d) @Inject

| 1-f. | The annotation is used to handle HTTP POST requests. (CO3) | 1 |

       (a) @GetMapping

       (b) @PutMapping

       (c) @CreateMapping

       (d) @PostMapping

| 1-g. | This component contains the data of the application. (CO4) | 1 |

       (a) Controller

       (b) Model

       (c) View

       (d) None of the above

| 1-h. | The port is used by Spring Boot by default, to start the Tomcat (CO4) | 1 |

       (a) 9090

       (b) 8080

       (c) 0

       (d) 4200

| 1-i. | The JPA Entities will become detached when _____(CO5) | 1 |

       (a) When the transaction (in transaction-scoped persistence context) commits,

.

entities managed by the persistence context become detached.

(b) If an application-managed persistence context is closed, all managed entities become detached.

(c) Using a clear method

(d) All of these

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

(a) mappedBy

(b) cascade

(c) fetch

(d) Orphanremoval

2. Attempt all parts:-

2.a.	Discuss the steps of setting null value in JDBC PreparedStatement. (CO1)	2
2.b.	Discuss the purpose to use request Implicit Object in JSP. (CO2)	2
2.c.	Discuss the benefits of using Spring Tool Suite. (CO3)	2
2.d.	Explain role of dependency Injection.(CO4)	2
2.e.	Dsicuss about the constraints on an entity class? (CO5)	2

| **SECTION B** | **30** |

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

3-a.	Describe the process of creating a connection object. (CO1)	6
3-b.	Describe the advantages of using PreparedStatement in Java. (CO1)	6
3-c.	Explain the purpose and key features of the session Implicit Object in JSP development, and provide an example of how it can be used to store and retrieve session data. (CO2)	6
3-d.	Justify the architecture of JSP and how it works in web development in brief. (CO2)	6
3.e.	Discuss the importance of Spring bean configuration file. (CO3)	6
3.f.	Discuss and define the usage of package bean and service. (CO4)	6
3.g.	Explain JPA Architecture or Explain the core classes and interfaces of JPA API. (CO5)	6

| **SECTION C** | **50** |

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

| 4-a. | Explain the method of calling one Servlet from another Servlet. Explain using | 10 |

example. (CO1)

4-b.   Describe the Servlet Class Hierarchy with proper diagram. (CO1)   10

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

5-a.   Discuss the architecture of JSP, and explain how it works with web servers to   10
generate dynamic web content. (CO2)

5-b.   Define the key features and advantages of using JSP in web development, and   10
discuss how it compares to other web technologies such as Servlets and
PHP. (CO2)

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

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

6-b.   Discuss the steps to create ApplicationContext in a Java Program. (CO3)   10

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

7-a.   Describe dispatcher Servlet. Explain the role of dispatcher servlet with   10
example. (CO4)

7-b.   Define Spring Boot, its features, advantages and limitations. (CO4)   10

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

8-a.   Insert a record using JPA. Also discuss the mechanism used to connect   10
database. (CO5)

8-b.   Derive the need equals()/hashCode(), and how to implement them correctly for   10
JPA entities? (CO5)