06/01/2025 MCA (NEP-2020) SEM-I - ADVANCED JAVA QP CODE: 10072020

(2 Hours)   **[Total Marks: 50]**

Note:

1. Question No: 01 is compulsory.

2. Attempt any two questions from the remining four questions (Q. 2 to Q. 5).

3. Figures to the right indicate full marks.

4. Answers to sub questions should be answered together.

Note: • **Question number Q1 is compulsory** • **Attempt any two questions out of Q2 to Q5**			**Marks**	**Course Outcome** **CO**	**Bloom's Level** **BL**
Q1		Attempt any 4 from a to f			
	a.	Write a JSP code using scripting tags to calculate the factorial of a number entered by the user in an HTML form.	**[05]**	CO2	BL3
	b.	What are the different types of advice in Spring AOP?	**[05]**	CO4	BL1
	c.	What is Spring Boot, and how does it simplify database integration?	**[05]**	CO6	BL1
	d.	Assess the benefits of modeling JDBC operations as Java objects in a Spring application. How does this approach enhance code reusability and maintainability?	**[05]**	CO5	BL5
	e.	How does a List differ from a Set in terms of behavior and use cases? Provide examples.	**[05]**	CO1	BL2
	f.	What approach/s would you use to resolve the circular dependency in spring?	**[05]**	CO3	BL3
Q2	**a.**	Design a generic class Box<T> that can store and retrieve objects of any type. Extend it to include a method to compare two Box objects based on the stored value. Demonstrate its usage with Integer and String types.	**[08]**	CO1	BL6
	b.	Explain how Spring Boot simplifies the creation of RESTful web services. What is the role of the @RestController annotation in this process?	**[07]**	CO6	BL2
Q3	**a.**	Design an HTML form to accept an employee name. The employee's name will be displayed on the main JSP page along with a greeting message. The main JSP page also uses the <jsp:include> action to include a header and footer file dynamically. Create separate header.jsp with company details and footer.jsp files with date and time and include them in the main page.	**[08]**	CO2	BL3

	b.	Given a scenario where you need to perform validation before a method execution and logging after method completion, analyze which types of advice should be used and why. Explain with code snippet.	**[07]**	CO4	BL4
Q4	a.	What is auto-wiring in Spring? Explain various auto-wiring modes provided by Spring.	**[08]**	CO3	BL1
	b.	Given a Spring application with multiple complex queries, evaluate the maintainability and readability of the code when using JdbcTemplate. How can you optimize it?	**[07]**	CO5	BL5
Q5	a.	Explain the different types of session tracking in JSP. How does each method (cookies, URL rewriting, and session tracking) work, and when would you use each?	**[08]**	CO2	BL2
	b.	Analyze the advantages and limitations of using Generics compared to non-generic types in Java. How does it affect code readability, type safety, and runtime performance?	**[07]**	CO1	BL4

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