

(d) session.getParameter()

- 1-d. Observe which one is used to write Java code in JSP. (CO2) 1
- (a) HTML tags
 - (b) JavaScript code
 - (c) JSP tags
 - (d) CSS styles
- 1-e. The constructor mode of autowiring is----- (CO3) 1
- (a) Autowiring by property name. Spring tries to match and wire its properties with the beans defined by the same names in the configuration file.
 - (b) Spring first tries to wire using autowire by constructor, if it does not work, Spring tries to autowire by byType.
 - (c) Autowiring by property type. Spring tries to match and wire a property if its type matches with exactly one of the beans name in configuration file.
 - (d) Similar to byType, but type applies to constructor arguments. If there is not exactly one bean of the constructor argument type in the container, a fatal error is raised.
- 1-f. This is true about collection configuration elements. (CO3) 1
- (a) This helps in wiring a list of values, allowing duplicates.
 - (b) This helps in wiring a list of values but without any duplicates.
 - (c) This can be used to inject a collection of name-value pairs where name and value can be of any type.
 - (d) This can be used to inject a collection of name-value pairs where the name and value are both Strings.
- 1-g. The port is used by Spring Boot by default, to start the Tomcat (CO4) 1
- (a) 9090
 - (b) 8080
 - (c) 0
 - (d) 4200
- 1-h. Select the stereotype annotations in Spring. (CO4) 1
- A. @Component
 - B. @Service
 - C. @Repository

D. @Controller

- (a) A and B
- (b) A, B and C
- (c) Only B
- (d) All the above

- 1-i. JPA ----- equivalent with hibernate.cfg.xml file (CO5) 1
- (a) configuration.xml
 - (b) persistence.xml
 - (c) jpa.configuration.xml
 - (d) None
- 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. Explain the use of welcome-file-list. (CO1) 2
- 2.b. List various types of Implicit Objects in JSP. (CO2) 2
- 2.c. List some of the benefits of IoC. (CO3) 2
- 2.d. Is it possible to change the port of the embedded Tomcat server in Spring Boot? (CO4) 2
- 2.e. Does JPA performs the actual task like access, persist and manage data? (CO5) 2

SECTION B

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3. Answer any five of the following:-

- 3-a. Explain the Servlet Architecture. (CO1) 6
- 3-b. Discuss all the types of ResultSet. (CO1) 6
- 3-c. Discuss the initialization phase of the JSP life cycle, and explain how it prepares the servlet for execution by initializing all necessary resources. (CO2) 6
- 3-d. Simplify the compilation phase of the JSP life cycle, and discuss the role of the JSP compiler in generating Java bytecode from the servlet code. (CO2) 6
- 3.e. Explain the JDBC be used more efficiently in the Spring framework. (CO3) 6

- 3.f. Discuss about Dependency injection in spring boot with example. (CO4) 6
- 3.g. Illustrate the concept of entities in JPA in detail. (CO5) 6

SECTION C

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4. Answer any one of the following:-

- 4-a. Distinguish between the following Servlet, Generic Servlet and HTTP Servlet. (CO1) 10
- 4-b. Describe the Servlet Class Hierarchy with proper diagram. (CO1) 10

5. Answer any one of the following:-

- 5-a. Develop a JSP application that uses the JSP scriptlet tag to generate a dynamic HTML table of student data retrieved from a MySQL database. Your application should use JDBC to connect to the database and retrieve the data, and should use the JSP implicit object - out to write the table to the response stream. Write a brief report on the steps you followed to create the application, including details on the JSP life cycle, the JSP API used, and the database connectivity configuration. (CO2) 10
- 5-b. Build a simple JSP application that accepts user input via a form and displays the input back to the user. Your application should use the JSP expression tag to display the input and should also use the request implicit object to retrieve the user input data. Write a brief report on the steps you followed to create the application, including details on the JSP life cycle and the various JSP tags used in the application. (CO2) 10

6. Answer any one of the following:-

- 6-a. Implement a program using autowiring also discuss the limitations of autowiring. (CO3) 10
- 6-b. Discuss the possible exceptions that can be thrown by Spring DAO classes. (CO3) 10

7. Answer any one of the following:-

- 7-a. Discuss about Spring Tool Suite. Create a Spring Boot Project Using STS. (CO4) 10
- 7-b. Draw and explain the SpringBoot architecture. Also mention the role of four layers with flow of architecture. (CO4) 10

8. Answer any one of the following:-

- 8-a. Derive the need equals()/hashCode(), and how to implement them correctly for JPA entities? (CO5) 10
- 8-b. Elaborate JPA handle optimistic locking. Can you give an example of how you would implement optimistic locking in JPA? (CO5) 10