

No. of Printed Pages : 2

MCS-220

**MASTER OF COMPUTER
APPLICATIONS (MCA) (NEW)**

Term-End Examination

December, 2021

MCS-220 : WEB TECHNOLOGIES

Time : 3 Hours

Maximum Marks : 100

Note : (i) Question No. 1 is compulsory.

(ii) Attempt any **three** questions from the rest.

1. (a) What is design pattern ? What are the advantages of using patterns ? Explain UML diagram of Factory Design Pattern. 10
- (b) What is Servlet Programming ? Briefly explain servlet life cycle. Also write a servlet which displays “welcome to web programming.” 10
- (c) What is JSP ? What are JSP directives ? Explain the use of any two JSP directives with the help of a program. 10

- (d) Explain process of setting up database using Hibernate. 10
2. (a) Explain process of creating records using Spring Boot and Hibernate. 10
- (b) Explain how testing of custom login form can be performed with the help of an example. 10
3. (a) Explain issues and challenges of web security. 10
- (b) What is Spring Boot DevTools ? Briefly explain its features. 10
4. (a) Briefly explain Crud Repository of Spring Boot. 10
- (b) Explain Spring MVC configuration process. 10
5. Write short notes on the following : 5 each
 - (a) JSP implicit objects
 - (b) Role based login
 - (c) Session management
 - (d) J2EE Architecture

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Term-End Examination

June, 2022

MCS-220 : WEB TECHNOLOGIES

Time : 3 hours

Maximum Marks : 100

Note : Question no. 1 is **compulsory** and consists of 40 marks. Attempt any **three** questions from the rest.

1. (a) What is J2EE ? Briefly explain J2EE architecture. 10
- (b) Explain servlet architecture. Also briefly explain the use of servlet with the help of an example. 10
- (c) Explain JSP scripting elements with the help of a program. 10
- (d) What is Spring Boot ? Briefly explain Spring Boot application properties. 10

2. (a) What is a design pattern ? Explain the advantages of using a design pattern in enterprise applications development, with the help of an example. 10
- (b) Explain Hibernate configuration with annotations. 10
3. (a) Explain Spring MVC framework with the help of a suitable diagram. 10
- (b) Explain the working and flow of Struts 2. 10
4. (a) Explain the steps of database connection using JSP and JDBC, with the help of a program. 10
- (b) Explain the use of load() and get() methods of Hibernate session, with the help of an example. 10
5. Write short notes on the following : 4×5=20
- (a) Java Cryptography Architecture (JCA)
- (b) JSP Standard Tag Library (JSTL)
- (c) JSP Life Cycle
- (d) Factory Design Pattern
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Term-End Examination

December, 2022

MCS-220 : WEB TECHNOLOGIES

Time : 3 hours

Maximum Marks : 100

Note : *Question no. 1 is **compulsory** and consists of 40 marks. Attempt any **three** questions from the rest.*

1. (a) What is web application ? Explain the use of web server for development of web applications. Also, describe the differences between web server and web container. 10
- (b) What is design pattern ? Explain the use of Singleton design pattern, with the help of an example. 10
- (c) What is Servlet ? Explain the use of HTTP protocol in servlet programming. Explain the use of GET and POST methods, with the help of examples. 10
- (d) What is Struts 2 ? Explain the core components of Struts 2. 10

2. (a) What are JSP implicit objects ? Explain the use of any four implicit objects. 10
- (b) Explain the use of Authorize Tag for providing view layer security, with the help of program code. 10
3. (a) What is Session Management ? Write a servlet program to demonstrate the use of HttpSession and its methods setAttribute and getAttribute. 10
- (b) Explain how Java Secure Socket Extension (JSSE) is used in web security. 10
4. (a) Explain core container and its components in Spring Framework. 10
- (b) Explain how CRUD is mapped to SQL statement, with example. 10
5. (a) What is Role-based Login ? Explain how user's access can be restricted using Role-based Login. 10
- (b) Write short notes on the following : 10
- (i) Servlet Collaboration
 - (ii) JSP Life Cycle

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MCS-220 : WEB TECHNOLOGIES

Time : 3 Hours

Maximum Marks : 100

Note : (i) *Question no. 1 is compulsory.*

(ii) *Attempt any **three** questions from the rest.*

1. (a) Differentiate between web server and web container. Give example for each. 5

(b) Compare GenericServlet with HttpServlet.

5

P. T. O.

- (c) What is session management ? Explain how cookies can be used to session management. 5
- (d) Write JSP program using scriptlets that adds numbers from 1 to 10 and prints the results. Support your code with suitable comments. 5
- (e) What is a ValueStack in struts ? How ValueStack is related to OGNL (Object Graph Navigation Language) ? 5
- (f) Differentiate between Spring and Hibernate. 5
- (g) What is Dependency Injection in spring framework ? Name the ways through which Dependency Injection can be performed. 5
- (h) What is Bootstrap ? Briefly discuss the factors that makes Bootstrap a popular choice for the development of web applications. 5

2. (a) What is Spring Boot ? Write the steps to deploy Spring Boot web application as JAR and WAR files ? 10
- (b) What is Hibernate Query Language (HQL) ? How does HQL differ from SQL ? Write HQL queries for Select, Update, Delete and Insert (make suitable assumptions). 10
3. (a) Briefly discuss the term “Spring Data Repository”. Also explain the CrudRepository, PagingAndSorting Repository, and JpaRepository interfaces of Spring DataRepository. 10
- (b) Explain the following : 10
- (i) Java Cryptography Architecture (JCA)
- (ii) Java Secure Socket Extension (JSSE)
4. (a) What is Spring Security ? Discuss the terms “Authentication” and “Authorization” in context of Spring Security. Also mention methods for both. 10

- (b) Why login form customization is required in an application ? Explain the customized login form configuration with a simple code. Also, discuss `loginPage()` and `loginProcessing Url()` in Spring Boot Security Configuration. 10

5. Write short notes on the following : 5×4=20

- (i) Servlet Architecture
- (ii) JSP life cycle
- (iii) Annotations and its types
- (iv) Aspect-oriented programming

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Note : (i) *Question no. 1 is compulsory.*

(ii) *Attempt any **three** questions from the rest.*

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1. (a) What is J2EE ? Briefly discuss the components of J2EE. 5
 - (b) What is a servlet ? Briefly discuss the lifecycle of servlet. 5
 - (c) Differentiate between session and cookie. Give suitable example for each. 5

P. T. O.

- (d) Write JSP program for Fibonacci series. Support your code with suitable comments. 5
 - (e) What are Interceptors in struts2 ? Briefly discuss the role of Interceptors in struts2. 5
 - (f) Differentiate between spring boot and spring MVC. 5
 - (g) Briefly discuss the term “Inversion of Control (IoC)”. Also, draw block diagram for IoC flow. 5
 - (h) What is Custom CSS ? How custom CSS can be included in to JSP ? Discuss. 5
2. (a) What is the need of application properties in spring boot ? Explain how application properties of spring boot can be set through properties files, command-line arguments and environment variables. 10
- (b) What is Hibernate ? Briefly discuss the various states of Hibernate Entity Life Cycle. Also, draw block diagram for the same. 10

3. (a) What is the relationship between JPA, spring data JPA and Hibernate ? Explain Eager and Lazy loading in Hibernate. How does the Eager and Lazy loading improves the performance of Hibernate applications ? 10
- (b) What is Message Digest ? How does message digest differ from message authentication code ? Give characteristics of both. 10
4. (a) Briefly discuss the following security vulnerabilities of any web app : 10
- (i) Cross Site Scripting (XSS)
 - (ii) Cross-Site Request Forgery (CSRF)
 - (iii) SQL Injection (SQLi)
 - (iv) Denial-of-Service (DoS)
 - (v) Insecure Direct Object References (IDOR)
- (b) Describe role-based login. Write the sample code to configure the role-based login. 5

- (c) What is role based access control ? Write the simple configuration code to restrict the URL access based on role. 5
5. Write short notes on the following : 5×4=20
- (i) Design Patterns
 - (ii) Servlet Collaboration
 - (iii) Components of JSP
 - (iv) Spring Framework

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Time : 3 Hours

Maximum Marks : 100

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt any **three** questions from the rest.*

1. (a) Differentiate between web server and web container. 5
- (b) What are “Creational Design Patterns” ?
Write their utility. 5

P. T. O.

- (c) How struts 2 differs from struts 1 ? List the various features of struts 1. 5
- (d) What is Hibernate framework in Java ? What is the utility of Hibernate ? Give advantages of Hibenate framework. 5
- (e) Differentiate between load() and get() methods. 5
- (f) Explain the term Aspect Oriented Programming with suitable example. 5
- (g) Compare spring boot and spring MVC. 5
- (h) What is message digest ? Write the steps to send encrypted data with message digest and for the validation of encrypted data. 5
2. (a) Explain the various components of J2EE architecture with suitable block diagram. 7
- (b) Explain the servlet life cycle. Also compare the generic servlet with HTTP servlet. 8

- (c) Discuss the role of cookies in session management. How does persistent cookies differ from non-persistent cookies ? 5
3. (a) Explain the cooking and flow of struts 2 with suitable block diagram. 10
- (b) How does Built-in Java Annotation differ from Java Custom Annotation ? Briefly discuss the various annotations classified under each. 10
4. (a) What is spring boot ? Explain the need of spring boot. Describe the working of spring boot with suitable block diagram. 8
- (b) Explain any **four** of the following web application security vulnerabilities :4×3=12
- (i) Cross site scripting
 - (ii) Cross site request forgery
 - (iii) SQL injection
 - (iv) Denial of Service
 - (v) Insecure direct object reference

5. Write short notes on the following : $4 \times 5 = 20$

- (a) Java Secure Socket Extension (JSSE)
- (b) Spring security modules
- (c) Role Based Access Control (RBAC)
- (d) Cross Site Request Foregery (CSRF)
- (e) Hibernate Query Language (HQL) and Insert, Delete, Update, Select queries in HQL