

MASTER OF COMPUTER APPLICATIONS (MCA_NEW/MCAOL)

SEMESTER-2 ASSIGNMENTS OF MCA_NEW/MCAOL PROGRAMME S

(July - 2026 & January - 2027)

MCS-218, MCS-219, MCS-220, MCS-221

MCSL-222, MCSL-223

**SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068**

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Important Notes

1. MCA_NEW Student need to submit the assignments to the Coordinator of your Study Centre on or before the due date.
2. MCAOL Student need to submit the assignments on LMS Portal on or before the due date.
3. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to Programme Guide.
4. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the Programme Guide.
5. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	:	MCS-220
Course Title	:	Web Technologies
Assignment Number	:	MCA_NEW/MCAOL(II)/220/Assign/2026-27
Maximum Marks	:	100
Weightage	:	30%
Last date of Submission	:	31st October, 2026 (For July, 2026 Session) 15th April, 2027 (For January, 2027 Session)

Note: This assignment contains nine questions of 80 marks. Answer all questions. The remaining 20 marks are for viva voce. Use suitable diagrams, flowcharts, code snippets and illustrations wherever appropriate. Follow the assignment guidelines given in the Programme Guide.

- Q1: (a)** Define the following terms with suitable examples: **(5 Marks)**
- Design Pattern
 - Web Application
 - Servlet Container
 - JSP
 - Dependency Injection
- (b)** Explain the layered architecture of a modern Java web application. Discuss the role of Presentation Layer, Business Layer, Persistence Layer and Database Layer. **(5 Marks)**
- Q2: (a)** Explain the Servlet life cycle with the help of a neat diagram. Discuss the purpose of each life-cycle method. **(5 Marks)**
- (b)** Explain the HTTP request-response cycle. Describe how request parameters, headers and cookies are exchanged between a client and a web server. **(5 Marks)**
- Q3: (a)** Write a JSP program that accepts two numbers from a user and displays their Greatest Common Divisor (GCD). Explain the execution of your program. **(5 Marks)**
- (b)** Write a Servlet program that accepts employee details from an HTML form and displays the submitted information on another web page. **(5 Marks)**
- Q4:** A university wishes to develop an online student registration system. Explain how JDBC can be used to connect the application with a relational database. Illustrate the steps involved in establishing the connection, executing SQL statements and handling exceptions. **(5 Marks)**
- Q5:** Analyze the differences between Spring MVC and Spring Boot with respect to architecture, configuration, deployment, scalability and development effort. Discuss situations where each framework is most appropriate. **(5 Marks)**
- Q6: (a)** Compare Hibernate and JDBC for database application development. Analyze their advantages, limitations and suitable application scenarios. **(5 Marks)**
- (b)** Explain how Spring Data JPA simplifies database programming compared to traditional DAO implementation. Support your answer with suitable examples. **(5 Marks)**
- Q7:** A banking application requires strong authentication and authorization. Evaluate different security mechanisms provided by Spring Security, including authentication, authorization, password encoding and session management. Recommend an appropriate security strategy with justification. **(10 Marks)**

- Q8:** (a) Explain the importance of software testing in web applications. Evaluate the usefulness of unit testing, integration testing and security testing in ensuring application quality. **(5 Marks)**
- (b) Discuss the importance of exception handling and logging in enterprise web applications. Evaluate how proper logging improves application maintenance and debugging. **(5 Marks)**
- Q9:** Develop the design of a Library Management Web Application using Spring Boot. **(10 Marks)**

Your solution should include:

- MVC architecture diagram
- Database entities and relationships
- Repository, Service and Controller components
- CRUD operations for books and users
- Login module using Spring Security
- Brief explanation of the application workflow

Support your answer with suitable diagrams and code snippets wherever necessary.