

# **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.

|                                |          |                                                                                                                                 |
|--------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Course Code</b>             | <b>:</b> | <b>MCSL-222</b>                                                                                                                 |
| <b>Course Title</b>            | <b>:</b> | <b>OOAD and Web Technologies Lab Assignment</b>                                                                                 |
| <b>Number</b>                  | <b>:</b> | <b>MCA_NEW/MCAOL(II)/L-222/Assign/2026-27</b>                                                                                   |
| <b>Maximum Marks</b>           | <b>:</b> | <b>100</b>                                                                                                                      |
| <b>Weightage</b>               | <b>:</b> | <b>30%</b>                                                                                                                      |
| <b>Last date of Submission</b> | <b>:</b> | <b>31<sup>st</sup> October, 2026 (For July, 2026 Session)</b><br><b>15<sup>th</sup> April, 2027 (For January, 2027 Session)</b> |

**Note: This assignment has two sections. Answer all questions in each section. Each Section is of 20 marks. Your Lab Records will carry 40 Marks (20 Marks for each section). Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. You must execute the program and submit the program logic, sample input and output along with the necessary documentation. Assumptions can be made wherever necessary. Please go through the guidelines regarding assignments given in the Programme guide for the format of presentation.**

### **Section 1: OOAD Lab**

**Question 1: (20 Marks)**

- i. Draw a Class Diagram for a distributed, multi-tiered Online Examination System capturing role-based administrative boundaries and runtime assessment constraints. **(5 Marks)**
- ii. Design a secure, decentralized Deployment Diagram representing an Online Banking Infrastructure across multi-tiered hardware execution nodes, protocol wrappers, and security zones. **(5 Marks)**
- iii. Draw a State Machine Diagram capturing the execution lifecycle, event triggers, and transactional guard conditions for an Online Re-registration and Fee Payment Subsystem for IGNOU MCA Learners. **(5 Marks)**
- iv. Draw a Sequence Diagram mapping the chronological(synchronous and asynchronous) object interactions, including conditional exception frames, for an ATM management system. **(5 Marks)**

### **Section 2: Web Technologies Lab**

**Question1: (20 Marks)**

- i. Develop a robust, enterprise-grade server-side application using Java Server Pages (JSP) and Java Database Connectivity (JDBC) to manage profile modifications for university students (e.g., IGNOU BCA/MCA Students). The application must implement a unified dynamic lookup interface that accepts either a unique Student Enrollment Number or a registered Mobile Number as an input token. Upon successful verification of the student, the interface must securely expose and permit modifications to the student's data, specifically communication address, mobile contact number, and verified email etc. You need to explicitly state your database schema definition and connection configuration assumptions before presenting the source code. **(10 Marks)**
- ii. Design and develop a highly secure, multi-layered RESTful or MVC web application implementing full CRUD (Create, Read, Update, Delete) lifecycle workflows using Spring Boot

and Hibernate/JPA frameworks. The system will serve as an automated portal for Online Registration and Fee Payment for an industry-level workshop on "*Web Technologies*". Furthermore, implement rigorous security configurations (such as Spring Security protocols) to enforce Authentication and Role-Based Access Control (RBAC), while ensuring that updates or deletions to registration rows are structurally validated and restricted according to payment settlement status etc. Make necessary assumptions and list them. **(10 Marks)**