

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**

CONTENTS

Course Code	Assignment No.	Submission-Schedule		Page No.
		For July-December Session	For January-June Session	
MCS-218	MCA_NEW/MCAOL(II)/218/Assign/26-27	31 st October, 2026	15 th April, 2027	3
MCS-219	MCA_NEW/MCAOL(II)/219/Assign/26-27	31 st October, 2026	15 th April, 2027	5
MCS-220	MCA_NEW/MCAOL(II)/220/Assign/26-27	31 st October, 2026	15 th April, 2027	7
MCS-221	MCA_NEW/MCAOL(II)/221/Assign/26-27	31 st October, 2026	15 th April, 2027	9
MCSL-222	MCA_NEW/MCAOL(II)/L-222/Assign/26-27	31 st October, 2026	15 th April, 2027	10
MCSL-223	MCA_NEW/MCAOL(II)/L-223/Assign/26-27	31 st October, 2026	15 th April, 2027	12

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	:	MCSL-223
Course Title	:	Computer Networks and Data Mining Lab
Assignment Number	:	MCA_NEW/MCAOL(II)/L-223/Assign/2026-27
Maximum Marks	:	100
Weightage	:	30%
Last Dates for Submission :		31st October, 2026 (For July, 2026 Session) 15th April, 2027 (For January, 2027 Session)

The assignment has two parts A and B. Answer all the questions. Each part is for 20 marks. Computer Networks and Data Mining lab record carries 40 Marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the MCA(New) Programme Guide for the format of presentation. If any assumptions made, please state them.

PART-I: Computer Networks **(4 x 5 = 20 Marks)**

The following questions may be implemented using any open-source computer network programming platform, like Network Simulator-3 (NS-3).

- Q1:** Create a network consisting of 4 nodes connected using Point-to-Point links. Configure IP addresses, install the Internet stack, and transmit packets from Node 1 to Node 4. Verify successful communication using the simulation output. Make any further suitable assumptions, wherever necessary.
- Q2:** Design a network of 6 nodes where communication between the source and destination requires at least 3 hops. Configure Point-to-Point links and demonstrate successful packet transmission. Also, measure the end-to-end delay and packet delivery.
- Q3:** Construct a topology with two different paths between a source node and a destination node. Assign different delays or bandwidths to the links. Simulate packet transmission and observe which path is selected. Also, modify one link parameter and compare the results.
- Q4:** Create a network of 7 interconnected nodes, and simulate a broadcast packet transmission from one node and observe how packets propagate through the network. Compare the number of transmissions with a manually constructed logical spanning tree, and comment on the reduction in redundant transmissions.

PART-II: Data Mining Lab **(2 x 10 = 20 Marks)**

There is equal marks weightage in all sub-parts of a question.

- Q1:** Implement the K-Means Clustering algorithm on the following datasets and analyze the generated clusters. Comment on the suitability of the selected number of clusters.

- a. Customer Purchase dataset with attributes: Customer ID, Age, Gender, Annual Income, Spending Score, Membership Type, and Number of Purchases.
- b. Student Performance dataset with attributes: Student ID, Attendance Percentage, Internal Assessment Marks, Assignment Score, Study Hours per Week, and Final Grade.

Assume creating the above files in .csv format and prepare it as .arff file. You may process the files and apply the clustering mechanism using WEKA.

Q2: Apply the Apriori Association Rule Mining algorithm on the following transactional datasets. You may generate frequent itemsets and association rules by selecting suitable minimum support and confidence values. Also, provide interpretation of the discovered patterns in all following cases:

- a. Retail Store Transaction with attributes: Transaction ID, Customer ID, Item Purchased, Product Category, Quantity, Day of Purchase, and Payment Mode. You may create a retail file or any in-built retail.arff file can be used.
- b. Using WEKA, apply the Apriori algorithm to a market basket dataset. Experiment with different minimum support and confidence values, and compare the generated association rules.