

# **BRIDGE COURSES FOR MASTER OF COMPUTER APPLICATIONS (MCAOL)**

**ASSIGNMENTS**

**(January - 2025)**

**MCS-201 and MCS-208**



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

## CONTENTS

Course Code	Assignment No.	Submission-Schedule	PageNo.
		For January-June Session	
MCS-201	PGDCA_NEW(I)/201/Assignment/25	30 <sup>th</sup> April, 2025	3
MCS-208	PGDCA_NEW(II)/208/Assignment/25	30 <sup>th</sup> April, 2025	5

### Important Notes

1. Submit your assignments through the Learning Management System (LMS) on or before the due date.
2. 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 of MCAOL (2Yrs).
3. 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 of MCAOL (2yrs).
4. 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>MCS-201</b>
<b>Course Title</b>	:	<b>Programming in C and PYTHON</b>
<b>Assignment Number</b>	:	<b>PGDCA_NEW(I)/201/Assign/2025</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>30%</b>
<b>Last Date of Submission</b>	:	<b>30<sup>th</sup> April 2025 (for January Session)</b>

**There are ten questions in this assignment which carries 80 marks. Each question carries 8 marks. Rest 20 marks are for viva-voce. Answer all the questions from both the sections i.e. Section A and Section B. You may use illustrations and diagrams to enhance the explanations. Include the screen layouts also along with your assignment responses. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

### **SECTION-A (C-Programming)**

**Q1:** Write an algorithm, draw a flow chart and write its corresponding C program to convert a Binary decimal number to its equivalent Decimal number. **(8 Marks)**

**Q2:** Write an algorithm and use the concept of Structures to write the program in C, to generate Progress-Report of students of a class X of the school for all its 4 terms (the class is of 20 students). Assumptions can be made wherever necessary. **(8 Marks)**

**Q3:** Write a C program to generate the following pattern: **(8 Marks)**

```
*
* *
* * *
* * * *
* * * * *
```

**Q4:** Write a C program to perform the following operation on matrices  $D = A * (B + C)$ , where A, B and C are matrices of (3 X 3) size and D is the resultant matrix. **(8 Marks)**

**Q5:** Use the concept of File Handling, to Write a program in C, to collect a list of N numbers in a file, and separate the even and odd numbers from the given list of N numbers, and put them in two separate files namely even\_file and odd\_file, respectively. **(8 Marks)**

### **SECTION-B (PYTHON-Programming)**

**Q6:** Write Python code to perform the following: **(8 Marks)**

- (i) Copy content of file first.txt to second.txt
- (ii) Reading a file
- (iii) Writing into a file
- (iv) Appending into a file

**Q7:** Write an algorithm to find the slope of a line segment whose endpoint coordinates are  $(x_1, y_1)$  and  $(x_2, y_2)$ . The algorithm gives output whether the slope is positive, negative or zero. Transform your algorithm into Python program. **(8 Marks)**

**Note:** Slope of line segment =  $(y_2 - y_1)/(x_2 - x_1)$ .

**Q8:** Write a programme in Python to create a package named Volume and create 3 module in it named – Cube, Cuboid and Sphere each having a function to calculate Volume of Cube, Cuboid and Sphere respectively. Import the module in separate location and use the functions. Assumptions can be made wherever necessary. Support your programme with suitable comments to improve readability. **(8 Marks)**

**Q9:** Write a program in Python to perform following: **(8 Marks)**

- To find square root of numbers in a list using lambda function.
- To display first n lines from a file, where n is given by user.
- To display size of a file in bytes
- To display frequency of each word in a file.

**Q10:** What are Co-routines? How Co-routines differ from threads? How Co-routines support cooperative multi-tasking in python? Compare Subroutines and Co-routines. **(8 Marks)**

<b>Course Code</b>	:	<b>MCS-208</b>
<b>Course Title</b>	:	<b>Data Structures and Algorithms</b>
<b>Assignment Number</b>	:	<b>PGDCA_NEW(II)/208/Assign/2025</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>25%</b>
<b>Last Dates for Submission</b>	:	<b>30<sup>th</sup> April 2025 (for January Session)</b>

**There are four questions in this assignment, which carry 80 marks. Each question carries 20 marks. Rest 20 marks are for viva voce. All algorithms should be written nearer to C programming language. You may use illustrations and diagrams to enhance the explanation, if necessary. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

- Q1:** What is a Doubly Linked Circular List? What are its advantages and disadvantages? Give a scenario where its application is appropriate. Justify your answer. **(20 Marks)**
- Q2:** What is a Tree? How does it differ from a Binary Tree? Is it possible to convert a Tree to a Binary Tree? If yes, then, explain the process with an example. **(20 Marks)**
- Q3:** What are Red Black Trees? How do they differ from Splay Trees? What are their applications? **(20 Marks)**
- Q4:** Write a short note on the recent developments in the area of finding shortest path between two nodes of a Graph. Make necessary assumptions. **(20 Marks)**