Course Code	**:**	**MCS-201**
Course Title	**:**	**Programming in C and PYTHON**
Assignment Number	**:**	**PGDCA_NEW(I)/201/Assign/2025**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last Date of Submission	**:**	**30th April 2025 (for January Session)**

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 $(x1, y1)$ and $(x2, y2)$. 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 = $(y2 - y1)/(x2-x1)$.

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)**