ASSIGNMENT   SET – I

Mathematics: Semester-I

M.Sc (CBCS)

Department of Mathematics

Mugberia Gangadhar Mahavidyalaya

PAPER - MTM-197

Paper: Lab 1: Computational Methods using MATLAB

Group A

Answer all questions.

1. Write a script in MATLAB to generate the Fibonacci sequence.
2. Write a script in MATLAB to find the prime numbers between two specified numbers.
3. Write a script in MATLAB to generate Pascal triangle.
4. Write a script in MATLAB to find the roots of an equation by iteration method.
5. Write a script in MATLAB to find the prime factors of a positive integer.
6. Write a script in MATLAB to calculate the roots of the quadratic equation $2x^2 + 5x - 3 = 0$.
7. Write a script in MATLAB to find the product of diagonal elements of a square matrix.
8. Write a script in MATLAB to test a number is palindrome or not.
9. Write a script in MATLAB to find the mean for a set of discrete data.
10. Write a script in MATLAB to calculate the nC_r.
11. Write a user defined function in MATLAB to test a number is divisible by another number or not and using this conclude for the numbers 7777 and 11.
12. Write a script in MATLAB to find the inverse of a square matrix.
13. Write a script in MATLAB to calculate the roots of the cubic equation $x^3 + 1 = 0$.
14. Write a user defined function in MATLAB to test a number is prime or not prime.
15. Write a user defined function in MATLAB to test a number is divisible by another number or not and using this conclude for the numbers 9999 and 11.

Group B

Answer all questions.

1. Write a script in MATLAB to calculate correlation coefficient of the following data: $X = (1, 2, 3, 4, 5, 6, 7)$ and $Y = (9, 8, 15, 12, 17, 13, 14)$.
2. Write a script in MATLAB to find the value of $\int_a^b f(x)\, dx$ by Simpson's 1/3 rd rule and using this find the value of the integral $\int_0^1 \frac{1}{1+x3}\, dx$ by dividing 100 sub-intervals.
3. Write a script in MATLAB to find the real root of the equation $f(x) = 0$ by Regula-Falsi method and using this find a real root of the equation $\sin x + 5x + 1 = 0$.
4. Write a script in MATLAB to find the real root of the equation $f(x) = 0$ by bisection method and using this find a real root of the equation $\cos x - 3x + 1 = 0$.
5. Write a script in MATLAB to find the mean and standard deviation for discrete distribution. Test using following data:

x_i	1	2	3	4	5	6	7	8	9
f_i	8	10	11	16	2	5	17	13	4

6. Write a script in MATLAB to find the median of the following numbers: 7, 8, 9, 6, 3, 9, 8, 5, 7, 11.
7. Write a script in MATLAB to find the standard deviation of the following numbers: 7, 8, 9, 6, 3, 9, 8, 5, 7, 11

Group C

Answer all questions.

1. Write a script in MATLAB to find the pie diagram of a M.Sc. 1st semester students of the following marks: 35, 42, 25, 36, 38, 15.
2. Write a script in MATLAB to draw $\sin t$ and $\cos t$ in the interval $[-\pi, \pi]$ in the same figure with different line specifications.
3. Write a script in MATLAB to draw $\sin t$ and $\sin 4t$ in the interval $[0, 4\pi]$ with mentioning title, axes and different line specifications.
4. Write a script in MATLAB to draw following parametric equations $x = \sin t$ and $y = \cos t$ in the interval $[0, 2\pi]$.
5. Write a script in MATLAB to draw $y = |x|$ in the interval $[-4, 4]$ with mentioning title, axes and axes limits.
6. Write a script in MATLAB to draw the following function in the interval $[-1, 4]$

$$f(x) = \begin{cases} x^2 + 1, & -1 \le x < 0 \\ 0, & x = 0 \\ x^3 + 2x + 5, & x > 0 \end{cases}$$

7. Write a script in MATLAB to draw the following function in the interval $[-\pi, \pi]$

$$f(x) = \begin{cases} \sin x, & -\pi \leq x < 0 \\ 0, & x = 0 \\ \tan x, & x > 0 \end{cases}$$

8. Write a script in MATLAB to draw surface of the equation $z = \sin x + \cos y$ in the range $-2\pi \leq x \leq 2\pi$ and $0 \leq y \leq 4\pi$.

_____End_____