

## **Homework-2**

### **ICME MS5523 (2022)**

#### **Instructions:**

1. Copying is strictly not allowed and will lead to negative marks.
2. Late submission will lead to zero marks
3. Prepare answer scripts using “word or latex”, handwritten scripts are not allowed
4. The filename should be in the following format “Roll No\_HW2”.
5. The file should be in PDF format.
6. Attach the screenshots of MATLAB program and outputs in the answer script, also upload them separately.

**Q1)** What is LU decomposition in linear algebra? What are the methods to get LU decomposition? Explain each with examples using MATLAB code. (1-1-2)

**Q2)** Using MATLAB find the roots of the given 4<sup>th</sup> degree polynomial

$$x^4 - 4x^3 + 7x^2 - 16x + 12 = 0$$

(1)

**a)** Also integrate the polynomial and find the derivative at  $x = 3.1$  and  $0.2$  (1-1)

**Q3)** What is a Lagrange polynomial? Write a MATLAB code to explain the concept of interpolation. (1-2)