PRESIDENCY UNIVERSITY

SCHOOL OF ENGINEERING

Course Name	Numerical Methods for Engineers		
Course Code	MAT2003	Submission Deadline	05/04/2023
Class	4th sem	Academic Year	2022 - 2023

ASSIGNMENT QUESTIONS

1. Express the following system of equations in matrix form to find L and U matrices. Hence find the solution.

   a. $x_1 + x_2 + x_3 = 1, 3x_1 + x_2 - 3x_3 = 5$ *and* $x_1 - 2x_2 - 5x_3 = 10$

   b. $6x_1 + 18x_2 + 3x_3 = 3,\ 2x_1 + 12x_2 + x_3 = 19,\ 4x_1 + 15x_2 + 3x_3 = 0$

   c. $x + y + z = 1,\ 4x + 3y - z = 6,\ 3x + 5y + 3z = 4$

   d. $x + 2y + 3z = 9,\ 4x + 5y + 6z = 24,\ 3x + y - 2z = 4$

2. Solve the system of equations using the Gauss-Siedel iterative method

   a. $26x_1 + 2x_2 + 2x_3 = 12.6, 3x_1 + 27x_2 + x_3 = -14.3$ *and* $2x_1 + 3x_2 + 17x_3 = 6.0$

   b. $5x_1 - 2x_2 + 3x_3 = -1, -3x_1 + 9x_2 + x_3 = 2$ *and* $2x_1 - x_2 - 7x_3 = 3$

   c. $10x_1 + x_2 + x_3 = 12,\ 2x_1 + 10x_2 + x_3 = 13$ *and* $2x_1 + 2x_2 + 10x_3 = 14$

3. Estimate real root of the following equations:

   a) $f(x) = x^3 - x - 1$ b) $f(x) = 2x^3 - 2x - 5$ c) -4x + cos x + 2 = 0

Note: Review of digital / e-resources from presidency university link (https://puniversity.knimbus.com) (mandatory to submit screenshot accessing digital resource. Otherwise Assignment will not be evaluated)