QUIZ 2 - Variant 1

Task 1 – Paper+Python (40/100)

x	y
1	12
1.5	14
2	15
2.5	14
3	13
3.5	12
4	11
4.5	9
5	8
5.5	7
6	6
6.5	5

- Fit the following data using 3 models given below.
- Show parameters of each model in the screen.
- Plot given data and all curves in the same window. Plot gridlines and legend in the same window.
- Calculate error function Φ for all models and select the best model.

$$f_1(x) = \frac{ax}{e^{bx}}$$

$$f_2(x) = ax^2 + bx + c$$

$$f_3(x) = ax^3 + bx^2 + cx + d$$

Task 2: Python (30/100)

Solve the following system using method for Tridiagonal matrix. Check the roots.

$$\begin{cases} \mathbf{2.04}x_1 - x_2 = \mathbf{40.8} \\ -x_1 + \mathbf{2.04}x_2 - x_3 = \mathbf{0.8} \\ -x_2 + \mathbf{2.04}x_3 - x_4 = \mathbf{0.8} \\ -x_3 + \mathbf{2.04}x_4 = \mathbf{200.8} \end{cases}$$

Task 3: Paper (30/100)

Solve the following system using Gauss Elimination method with Partial Pivoting method. Write your explanations in details.

$$\begin{cases} x + y + z = 2 \\ 6x - 4y + 5z = 31 \\ 5x + 2y + 2z = 13 \end{cases}$$