Assignment 1:

Choose 3-laplace and Laplace inverse functions to fulfill the followings: -

1. **Analytical analysis based on examples.**
2. **Confirm the results using matlab codes**
3. **Name a practical implementation for your functions.**
4. **Comment on your results.**

Assignment 2:

Faddeev Algorithm:-

1. **Show the mathematical analysis and proof of Faddeev Algorithm for calculating $(sI-A)^{-1}$.**
2. **Solve an example.**
3. **Confirm your result using Matlab or any other programming language.**
4. **Comment on your result.**

Assignment 3:

Discrete form of continuous state space representation: -

1. **G (T) and H (T) proof.**
2. **Example analytical solution.**
3. **Confirm your result using Matlab or any other programming language.**
4. **Conclusions.**

Assignment 4:

It is required to (analyze, solve an example analytically, and solve the same example using Matlab or any other programming language, then comment on your results) for each of the followings: -

1. **Modified Euler's method.**
2. **4^{th} order Runge-Kutta method.**
3. **Lievenberg marquardt algorithm.**