

Experiment #05

Slot: L27+L28

MAT1011: CALCULUS FOR ENGINEERS

Class # 5972

Title: Laplace Transform - Evaluation and Application

Typically an e-record has the following sections:

Aim: The aim of the experiment.

Mathematical Background: A brief note about mathematics involved in the problem at hand. It involves Mathematical Model and the methods used in the experiment.

MATLAB code: The MATLAB code used to get the desired output.

Output and Conclusion: The output obtained using MATLAB and concluding remarks in terms of application in the relevant Engineering branch.

Along with the e-record submit your responses to the following questions.

1. Let $y(t)$ be the output and $x(t)$ be the input of a system. The **transfer function** of a system is defined as:

$$H(s) = \frac{L\{y(t)\}}{L\{x(t)\}} = \frac{Y(s)}{X(s)}.$$

For what function $x(t)$ the inverse Laplace transform of transfer function is the output of the system. Write a MatLab code to find transfer function of the system given by the ODE:

$$ay'(t) + by(t) = x(t) \quad y(0) = y_0.$$

2. Write an algorithm to solve a second order linear differential equation using Laplace transform.

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- The lab record with the solutions to the exercise problems must be submitted in **pdf format only**.
 - Write virtuously and don't make it an oversized document (preferably < 8 pages with file size < 1 MB).
 - Copying others' work can be injurious to your grades.