EEE 225 - Engineering Mathematics I
(Differential Equations)
Homework 2

26th Sep, 2022

1. Examine the following equations carefully and determine the order of the equation and whether the equation is nonlinear, linear time-varying (LTV), or linear time-invariant (LTI).

   (a)
   $$\frac{dy}{dt} + e^y y = 0 \tag{1}$$

   (b)
   $$\frac{dy}{dt} + e^t y = 0 \tag{2}$$

   (c)
   $$\frac{d^2y}{dt^2} + 4y\frac{dy}{dt} + 2y = 0 \tag{3}$$

   (d)
   $$(\frac{dy}{dt})^2 + 4\frac{dy}{dt} + 2y = 0 \tag{4}$$

   (e)
   $$\frac{d^3y}{dt^3} + \frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 2y = e^{-t^2} \tag{5}$$