# EEE 225 - Engineering Mathematics I (Differential Equations) <br> Homework 2 

$26^{\text {th }}$ 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)

$$
\begin{equation*}
\frac{d y}{d t}+e^{y} y=0 \tag{1}
\end{equation*}
$$

(b)

$$
\begin{equation*}
\frac{d y}{d t}+e^{t} y=0 \tag{2}
\end{equation*}
$$

(c)

$$
\begin{equation*}
\frac{d^{2} y}{d t^{2}}+4 y \frac{d y}{d t}+2 y=0 \tag{3}
\end{equation*}
$$

(d)

$$
\begin{equation*}
\left(\frac{d y}{d t}\right)^{2}+4 \frac{d y}{d t}+2 y=0 \tag{4}
\end{equation*}
$$

(e)

$$
\begin{equation*}
\frac{d^{3} y}{d t^{3}}+\frac{d^{2} y}{d t^{2}}+4 \frac{d y}{d t}+2 y=e^{-t^{2}} \tag{5}
\end{equation*}
$$

