Quiz 13

Name : _____

SID : _____

1. Find a general solution to the homogeneous equation:

$$\left(\frac{d}{dt} - 1\right)^2 \left(\frac{d^2}{dt^2} - \frac{d}{dt}\right) y = 0$$

2. Let

$$\mathbf{x}_1 = \begin{bmatrix} e^{-t} \\ 0 \\ e^{-t} \end{bmatrix}, \quad \mathbf{x}_2 = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}, \quad \mathbf{x}_3 = \begin{bmatrix} e^{3t} \\ 0 \\ -e^{3t} \end{bmatrix}.$$

Determine if $\{\mathbf{x}_1, \mathbf{x}_2, \mathbf{x}_3\}$ form a fundamental solution set of the system:

$$\mathbf{x}' = \begin{bmatrix} 1 & 0 & -2 \\ 0 & 0 & 0 \\ -2 & 0 & 1 \end{bmatrix} \mathbf{x}.$$