3.3.6 Finger Exercise: Equilibrium conditions for a linear system IVP

Finger Exercises 2 due Aug 10, 2023 05:00 IST Completed

Problem: Determine equilibrium conditions

3.0/3.0 points (graded)

MO2.8

Consider an Initial Value Problem governed by the following linear system of equations

$$\frac{\mathrm{d}\underline{u}}{\mathrm{d}t} = A\underline{u} + \underline{b} \tag{3.19}$$

with

$$A = \begin{bmatrix} -6 & 1 & 0 \\ 1 & -6 & 1 \\ 0 & 1 & -6 \end{bmatrix}, \quad \underline{b} = \begin{bmatrix} 4 \\ 8 \\ 16 \end{bmatrix} \tag{3.20}$$

Which of the following is the equilibrium condition for this Initial Value Problem?

$$\underline{u}_A = \begin{bmatrix} -4 \\ -8 \\ -16 \end{bmatrix}, \quad \underline{u}_B = \begin{bmatrix} -1 \\ -2 \\ -3 \end{bmatrix}, \quad \underline{u}_C = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \quad \underline{u}_D = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \quad \underline{u}_E = \begin{bmatrix} 4 \\ 8 \\ 16 \end{bmatrix} \tag{3.21}$$

- $\underline{u}_A$
- $\underline{u}_B$
- $\underline{u}_C$
- $\underline{u}_D$ ✔
- $\underline{u}_E$

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Answers are displayed within the problem

SOLUTION: The solution will be available shortly after the due date in

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