Quiz 5  10 minutes Show Work!!

Use the root or ratio test to determine if the series converges or diverges. Show all work.

\[ \sum \frac{n^k e^k}{k+1} \]

Ratio test because of the sum -

\[
\left| \frac{a_{k+1}}{a_k} \right| = \left| \frac{e^{k+1}}{e^k} \frac{k+2}{k+1} \right| = \frac{e}{\frac{k+2}{k+1}} = \frac{e}{1 + \frac{1}{k}}
\]

\[ \lim_{k \to \infty} \left| \frac{a_{k+1}}{a_k} \right| = \lim_{k \to \infty} \frac{e}{1 + \frac{1}{k}} = \frac{e}{1} = e \]

\[ R = e > 1 \quad \text{so} \quad \sum a_k e^k \text{ diverges by ratio} \]