| THE UNIVERSITY OF TEXAS AT SAN ANTONIO | QUIZ \# 3 |
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| EE 5143 | Ahmad F. Taha |
| LINEAR SYSTEMS AND CONTROL | September 12, 2017 |

Name:

1. Find the exponential, $e^{A t}$, of this matrix: $A=\left[\begin{array}{ccc}1 & 1 & 1 \\ 1 & 1 & 1 \\ -2 & -2 & -2\end{array}\right]$.

Hint: $A$ is nilpotent, i.e., $A^{k}=0$ for a $k$ that you should find.
2. Find the eigenvalues and eigevectors of $A=\left[\begin{array}{cc}1 & 2 \\ 0 & -5\end{array}\right]$ and then write $A$ as $A=$ $T D T^{-1}$ (the diagonal transformation).

