THE UNIVERSITY OF TEXAS AT SAN ANTONIO
EE 5143
LINEAR SYSTEMS AND CONTROL

QUIZ # 3 Ahmad F. Taha September 12, 2017

Name:

1. Find the exponential,  $e^{At}$ , of this matrix:  $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ -2 & -2 & -2 \end{bmatrix}$ .

*Hint*: A is nilpotent, i.e.,  $A^k = 0$  for a k that you should find.

2. Find the eigenvalues and eigevectors of  $A = \begin{bmatrix} 1 & 2 \\ 0 & -5 \end{bmatrix}$  and then write A as  $A = TDT^{-1}$  (the diagonal transformation).