

EE 381, Homework 4 – Part 1

Name, I.D. #, and Date: _____

Instructions: Attempt each problem. Submit this part of homework 4 with additional parts of homework 4 on 4/11/18 before homework review.

- 1.) The average depth of the Hudson Bay is 305 feet. Climatologist were interested in seeing if warming and ice melt were affecting the water level. Fifty-five measurements over a period of randomly selected weeks yielded a sample mean of 306.2 feet. The population variance is known to be 3.6 feet-squared. Can it be concluded at the 0.05 level of significance that the average depth has increased?

- 2.) To confirm her claim that abused children will show elevated levels of depression, a psychologist gave a test called the Profile of Mood States (POMS) to a sample of 50 abused children. The results showed a sample mean depression score of 17.3. (The population standard deviation is assumed to have a value of 5.4 which was determined from prior studies.) At a 5% level of significance can she conclude that abused children in general have a mean depression level of more than 15 (the mean for college students)?

- 3.) Determine, by hand calculation, the eigenvalues and eigenvectors of the matrix below.

$$\begin{bmatrix} 4 & 0 & 1 \\ -2 & 1 & 0 \\ -2 & 0 & 1 \end{bmatrix}$$