STAT 3611   Lab 6   S2015   Maghsoodloo

1(3 Points).   Use Minitab to verify (or otherwise) of the Example on pp. 97-98 of my Chapter 7 notes, which covers SI (Statistical Inference) on a Normal σ, testing the null hypothesis H_0: $\sigma = 7.00$ VS H_1: $\sigma < 7.0$ using Minitab's Stat $\rightarrow$ Basic Statistics $\rightarrow$ Scroll down to 1-Variance; for Minitab Data select Sample standard deviation $\rightarrow$ the dialogue-box should now be self-explanatory. You must append the Minitab's output onto the MPR (Minitab Project Report). Finally, relate the *P*-value of this test with the hypothesized process-STDEV $\sigma_0 \equiv 7.00$, where X = Fracture Toughness of 18%-nickel Steel plates. The pertinent data are on Canvas. Does this problem involve Process-Control, PCA, or GOF (Goodness-of-Fit)?

2(2 Points).   Use Minitab to verify (or otherwise) the results of the Example on pp. 99-101 of my Chapter 7 notes, which covers the SI on population proportion p. Go to Stat $\rightarrow$ Basic Statistics $\rightarrow$ Scroll down to 1 Proportion, testing H_0: p = 0.20. Using Minitab's summarized data, in the dialogue-box click on Option to select Normal Approximation and the rest should again be self-explanatory. Describe the relationship between the hypothesized $p_0 \equiv 0.20$ and the Minitab's 95% CI. You must append your output to your MPR. Does this problem involve SI, PCA, or GOF?

3(5 Points). **(i, 2 Points)** Use Minitab's 1-Sample Z to solve both parts **(a)** & **(b)** of Exercise 5 on p. 276 of Devore (8e)**,** where it is assumed that Helium Porosity (HMP), an STB QCH, measured in percent $\sim$ N(μ, 0.5625). However, for part **(b) please keep the same sample size n = 20 and the same sample average (or mean)** $\overline{\text{x}} = 4.85$. **For parts (a & b)**, does the given sample data provide sufficient evidence that the process mean **μ** is less than 5.20 at the 5% level (and then at the 2%-level)? Which 2 of the corresponding CIs (95% or 98%) provide more information about μ? Why? **(ii, 1.5 Points)** Minitab Can be used to work part **(c)** of this Exercise 5 on p. 276 of Devore (8e) as follows : Go to Stat $\rightarrow$ Power and Sample Size $\rightarrow$ Sample size for estimation; in the dialogue box put 0.40 for margin of error, then options, upper-bound, and make sure to tell Minitab that σ is known. Then, append onto your MPR. **(iii, 1.5 Points)** The same as in **3(ii)** but for Exercise **5(d)** on p. 276 of Devore (8e). The Minitab procedure will be the same as in part **(ii)** but the margin of error will be 0.20 (2-sided estimation), and please change the default CNFL (Conf. Level) of 0.95 to 0.99. Is the stated 99% CNFL also the same as the confidence coefficient $(1- \alpha)$? Please append to your MPR. Does this problem involve SI, PCA, or Goodness-of-Fit? Please save your entire MPR as a word.docx (optionally convert to a pdf), submit either to xzw0005 and/or upload only your word.docx (or pdf) onto Canvas. Thanks for your cooperations! S. Maghsoodloo **(Midterm next Monday using only Minitab)**