**ChE 320\_Spr\_17\_HW 6 Grading Rubric**

**Total: 100 pts.**(Please do not cut point more than once for the same mistake, e.g. If there are 3 parts in a question, answer was calculated wrong in the 1st part. But the method was correct for the 2nd and 3rd part; give student the points of 2nd and 3rd part*. If applicable, credits for the answers are also given for using correct units*)

**4-36 (20 pts)**

(a) The sample mean is the mid-point of the two intervals, or sample mean = 50.00. *+10 for correct answer*

(b) The wider interval is the 95% CI, and that is (38.02, 61.98). *+10 for correct answer*

**4-48** (t-table/ Table II in textbook) **(20 pts)**

a) P-value = 2\*P(t > 2.48): for degrees of freedom of 9 we obtain

2(0.01) < P-value < 2(0.025) = (0.02 < P-value < 0.05) *+2 for correct method, +2 for answer*

b) P-value = 2\*P(t > |-3.95|): for degrees of freedom of 9 we obtain

2(0.001) < P-value < 2(0.0025) = (0.002 < P-value < 0.005)  *+2 for correct method, +2 for answer*

c) P-value = 2\*P(t > 2.69): for degrees of freedom of 9 we obtain

2(0.01) < P-value < 2(0.025) = (0.02 < P-value < 0.05) *+2 for correct method, +2 for answer*

d) P-value = 2\*P(t > 1.88): for degrees of freedom of 9 we obtain

2(0.025) < P-value < (0.05) = (0.05 < P-value < 0.10) *+2 for correct method, +2 for answer*

e) P-value = 2\*P(t > |-1.25|): for degrees of freedom of 9 we obtain

2(0.10) < P-value < 2(0.25) = (0.20 < P-value < 0.50)

*+2 for correct method, +2 for answer*

**4-50 (20 pts)**

a)  *+3 for correct answer*

 *+3 for correct answer*

**One-Sample T: X**

Test of mu = 91 vs not = 91

Variable N Mean StDev SE Mean 95% CI T P

X 25 92.5805 2.3365 0.4673 (91.6160, 93.5450) 3.38 0.002

The null hypothesis can be rejected at the 0.05 level because the P-value = 0.002 < 0.05.

b) It is a two-sided test. *+3 for correct answer*

c) The null hypothesis is rejected at the 0.05 level because 90 is not included in the 95% CI. *+3 for correct answer*

d) 99% CI



 *+3 for correct method,* *+2 for correct answer*

e) P-value = P(t > 3.38): for degrees of freedom of 24 we obtain 0.001 < P-value < 0.0025 *+3 for correct answer*

**4-56 (20 pts)**

In order to use t statistics in hypothesis testing, we need to assume that the underlying distribution is normal.

1) The parameter of interest is the true Izod impact strength, μ.

2) H0: μ = 1.0

3) H1: μ > 1.0

4) t0 = 

5) Reject H0 if t0 > tα,n-1  where t0.01,19 = 2.539

6) = 1.121 s = 0.328 n = 20

t0 = 

7) Because 1.65 < 2.539, fail to reject the null hypothesis. There is not sufficient evidence to conclude that the true Izod impact strength is greater than 1.0 ft-lb/in at α = 0.01.

*+12 for correct method (or +8 if the procedure was incomplete),* *+8 for correct conclusion*

**4-64 (20 pts)**

The parameter of interest is the true mean natural frequency, μ.

For α = 0.10 and n = 5, tα/2,n-1 = t0.05,4 = 2.132

= 231.67 s = 1.53 *+4 for correct answer*

90%CI: 

230.21 ≤ μ ≤ 233.13 *+6 for correct method, +4 for correct conclusion*

With 90% confidence, the true mean frequency is between 230.21 Hz and 233.13 Hz. There is strong evidence that the mean natural frequency **differs** from 235. *+6 for correct conclusion*