**ChE 320\_Spr\_17\_HW 8 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 answersare also given for using correct units*)

**5-8(20 pts)**

88.85 92.54

1.5 1.2

n1 = 15 n2  = 20

a) 95% confidence interval:







With 95% confidence, the mean road octane number for formulation 2 exceeds that of formulation 1 by between 2.906 and 4.474. *+6 for correct method (or +3 if method only partially correct), +4 for answer*

b) 1) The parameter of interest is the difference in mean road octane number, and Δ0 = 0

2) H0:  or 

3) H1:  or 

4) The test statistic is



5) Reject H0 if z0<−zα = −1.645 or z0> zα = 1.645

6) 88.85 92.54

1.5 1.2

n1 = 15 n2  = 20



7) P-value =.

Because the P-value <0.05, reject the null hypothesis and conclude the mean road octane number for formulation 2 is significantly different from that of formulation 1 at α = 0.05.

*+6 for correct method (or +3 if method only partially correct), +4 for answer*

**5-26(20 pts)**

a) 1) The parameter of interest is the difference in mean melting point, 

2) H0:  or 

3) H1:  or 

4) The test statistic is



5) Reject the null hypothesis if t0<where −= −2.021 or t0> where = 2.021

6)420.48 425, Δ0 = 0 

s1 = 2.34 s2 = 2.5 

n1 = 21 n2 = 21



7) Because −5.99 <−2.021 reject the null hypothesis and conclude that alloys do not have the same melting point at α = 0.05 *+8 for correct method (or +4 if method only partially correct),+4 for answer*

b) P-value = 2P(t < -5.99), thus P-value < 0.0010 *+8 for answer*

**5-40(20 pts)**

= 868.375 sd = 1290, n = 8 where di = brand 1 - brand 2

99% confidence interval:





−727.46 ≤μd≤ 2464.21

Because zero is contained within this interval, there is no significant difference between the two brands of tire.

*+10 for correct method (or +5 if method only partially correct), +5 for answer, +5 for correct conclusion*

**5-50(20 pts)**

a)f0.25,5,10 = 1.59  *+5 for correct answer*

b) f0.10,24,9 = 2.28  *+5 for correct answer*

c) f0.05,8,15 = 2.64  *+5 for correct answer*

d) f0.75,5,10 =   *+5 for correct answer*

**5-54(20 pts)**

1) The parameters of interest are the variances of concentration, 

2) H0:

3) H1:

4) The test statistic is



5) Reject the null hypothesis if f0>where = 3.14

6) 11 10

2.77 2.41



7) Because 1.32 < 3.14 fail to reject the null hypothesis.

There is insufficient evidence to conclude that the two population variances differ at the 0.05 level of significance.

*+10 for correct method (or +5 if method only partially correct), +5 for answer, +5 for correct conclusion*