Prince Sultan University
STAT 271
Final Examination
Second Semester 2010/2011, Term 102
Sunday, 5th June 2011
Dr. Mohammed Al-Haj Ebrahem

Time Allowed: 120 minutes

Maximum points: 40 points

Name: _____ _____ _____
(First) (Middle) (Last)

ID Number: _____ **Serial Number**:_____ **Section:**_____

Important Instructions:

1. You may use CASIO scientific calculator that does not have programming or graphing capabilities.
2. You may NOT borrow a calculator from anyone.
3. You do NOT get special consideration if you forget your calculator.
4. Don't use notes or any notebook.
5. There should be NO talking during the examination.
6. Your exam will be taken immediately without any warning if your mobile is seen or heard.
7. You must show all your work beside the problem. Be organized.
8. You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.
9. This examination has **7** problems, some with several parts. Make sure that your paper has all these problems

Problem	Max points	Student's Points
1	5	
2	10	
3	5	
4	4	
5	4	
6	4	
7	8	
Total	**40**	

Q1 (5 points) A survey at a ballpark shows this selection of snacks purchased. At $\alpha = 0.05$, is the snack chosen independent of the gender of the consumer.

	Snack		
Gender	**Hot dog**	**Peanuts**	**Popcorn**
Male	12	21	19
Female	13	8	25

Q2 (10 points total) A researcher wishes to see whether there is any difference in the weight gains of athletes following one of three special diets. Athletes are randomly assigned to three groups and placed on the diet for 6 weeks. The weight gains (in pounds) are shown below.

Diet A	**Diet B**	**Diet C**
3	10	8
6	12	3
7	11	2
4	14	5
	8	
	6	

1. ***(5 points)*** Construct the ANOVA table and test at $\alpha = 0.05$, the claim that there is no difference among the means.

2. ***(5 points)*** Using the **Scheffe test**, test each pair of means to see whether a specific difference exists, use $\alpha = 0.05$.

Q3 (5 points) A study was conducted to see whether a certain medication had an effect on the weights (in pounds) of eight men. Their weights were taken before and six week after daily administration of the medication. The data are shown below.
Use the **Wilcoxon signed rank test**, to test if there is a significant difference in weights of men before and after daily administration of the medication? Use $\alpha = 0.05$.

Weight before	187	163	201	158	139	143	198	154
Weight after	178	162	188	156	133	150	175	150

Q4 (4 points) In Cleveland, a sample of 73 mail carriers showed that 10 had been bitten by an animal during one week. In Philadelphia, in a sample of 80 mail carriers, 16 had received animal bits. Construct the 95% for the difference of the two proportions.

Q5 (4 points total) Independent random samples from two normal populations with variances σ_1^2 and σ_2^2, produced the following summary of the data:

Population	**1**	**2**
Sample size	11	14
Sample variance	60.2	29.8

For testing $H_0: \sigma_1^2 = \sigma_2^2$ vs. $H_1: \sigma_1^2 > \sigma_2^2$ at $\alpha = 0.05$,

1. ***(1 point)*** Find the critical value.

2. ***(1 point)*** Calculate the value of the test statistic.

3. ***(1 point)*** Find the rejection region.

4. ***(1 point)*** Calculate the P-value

Q6 (4 points total) Given the following results:

$\sum_{i=1}^{7} X_i = 56,\ \sum_{i=1}^{7} Y_i = 336,\ S_{XY} = 382,\ S_{YY} = 785,\ SSR = 747$

1. ***(2 points)*** Obtain the equation of the best fitting line.

2. ***(2 points)*** Calculate the value of error sum of square, SSE.

Q7 (8 points total) A random sample of size 25 is drawn from a normal distribution with mean μ and variance σ^2 .The sample mean is equal 16 and the sample standard deviation is equal 9.

1. ***(2 points)*** Test at $\alpha = 0.05$, $H_0 : \mu = 20$ vs $H_1 : \mu \neq 20$.

2. ***(2 points)*** Construct a 95% confidence interval for μ .

3. ***(2 points)*** Test at $\alpha = 0.05$, $H_0 : \sigma^2 = 64$ vs $H_1 : \sigma^2 \neq 64$.

4. ***(2 points)*** Construct a 95% confidence interval for σ^2 .

Good Luck