Prince Sultan University
STAT 271
Final Examination
First Semester 2010/2011, Term 101
Sunday, 30th January 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 **8** 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	3	
5	5	
6	4	
7	4	
8	4	
Total	**40**	

Q1 (5 points) An instructor wishes to see if the way people obtain information is independent of their educational background. A survey of 400 high school and college graduates yielded the following information. At $\alpha = 0.05$, test the claim that the way people obtain information is independent of their educational background.

	Television	**Newspapers**	**Other Sources**
High school	159	90	51
College	27	42	31

Q2 (10 points total) A researcher wishes to try three different techniques to lower the blood pressure of individuals diagnosed with high blood pressure. The subjects are randomly assigned to three groups: the first group takes medication, the second group exercises, and the third group follows a special diet. After four weeks, the reduction in each person's blood pressure is recorded. The data are shown

Medication	**Exercise**	**Diet**
10	6	5
12	8	9
9	3	12
15	0	8
13	2	4

Note that: $\sum\sum X_{ij} = 116$, $\sum\sum X_{ij}^2 = 1162$

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) Nine students were selected to participate in an experiment. At the end of a particular statistics unit, they were given a quiz for which they were asked to memorize the necessary formulas. The results are recorded under test 1. The next day they were given a similar quiz but were allowed to use a formula sheet. The results are recorded as test 2. Use the **Wilcoxon signed rank test**, to test if a significant difference in scores of test 1 and test 2 can be concluded. Use $\alpha = 0.05$.

Test 1 (before)	78	95	72	65	70	70	79	85	75
Test 2 (after)	85	92	70	68	69	76	88	96	80

Q4 (3 points) A random sample of size $n = 64$ is taken from a normal distribution with mean μ and variance $\sigma^2 = 100$. Calculate the width of a 95% confidence interval for μ.

Q5 (5 points) For a random sample of size *n=14*, we have the following results: $\overline{X} = 1,\ \overline{Y} = 12,\ S_{XX} = 32,\ S_{YY} = 200\ , r^2 = 0.64$ and the relationship between X and Y is a strong negative .

1. ***(3 points)*** Obtain the equation of the best fitting line.

2. ***(2 points)*** Test at $\alpha = 0.05,\ H_0 : \rho = 0$ vs $H_1 : \rho \neq 0$.

Q6 (4 points) It is believed that 25% of U.S. homes have a direct satellite television receiver. Find the minimum sample size necessary to estimate the true proportion of homes with 95% confidence and within 3% of the true proportion.

Q7 (4 points) A researcher claims that the standard deviation of the number death annually from tornadoes in the United States is less than 35. If a sample of 11 randomly selected years had a standard deviation of 32, is the claim believable? use $\alpha = 0.05$.

Q8 (4 points) In a sample of 200 men, 130 said they used seat belts. In a sample of 300 women, 63 said they used seat belts. At $\alpha = 0.05$, test the claim that there is no difference in the proportion of men and women who used seat belts.

Good Luck