



Prince Sultan University
STAT 271

Final Examination
First Semester 2013/2014, Term 131
Saturday, 4th January 2014
Dr. Bahha Eldin Abdalla

Time Allowed: 120 minutes
Maximum points: 40 points

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

ID 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 4 problems, some with several parts. Make sure that your paper has all these problems

Problem	Max points	Student's Points
1	10	
2	10	
3	10	
4	10	
Total	40	

Q1 (I) (6 points) Complete the following statements with the best answer.

- a) When a 99% confidence interval is calculated instead of a 95% confidence interval with n being the same, the margin of error will be _____.
- b) The best point estimate of the population proportion is _____.
- c) When the population standard deviation is unknown and the sample size is less than 30, _____ table should be used in computing a confidence interval for the mean.
- d) A sample of 25 novels has a standard deviation of 9 pages. The 95% confidence interval of the population standard deviation is: (_____, _____).
- e) A survey of 90 families showed that 40 owned at least one television set. The 85% confidence interval of the true proportion of families who own at least one television set is (_____, _____).

(II) (4 points) In a chi-square independence test with 7 rows and 8 columns, the test statistic is 75

- a) Find the critical value. Use $\alpha = 0.005$
- b) Approximate the P -value.
- c) Make the decision.

Q2 (I) (5 points) A copyeditor thinks the standard deviation for the number of pages in a romance novel is smaller than 9. A sample of 25 novels has a standard deviation of 6 pages.

- State the hypotheses.
- Find the critical value. Use $\alpha = 0.01$
- Compute the test value.
- Approximate the P -value.
- Make the decision.

(II) (5 points) The following ANOVA table is given.

<i>Source</i>	<i>DF</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between				8
Within		990.5	3.5	
Total		1270.5		

- Complete the ANOVA table.
- Find the P -value of the test.
- Make the decision.
- What is the critical value for the Scheffe test? Use $\alpha = 0.05$

Q3 (I) (2 points) Complete the following statements with the best answer.

- a) When computing the F test value for the difference between two variances, you always place the _____ variance in the numerator of the fraction.
- b) To test the equality of two proportions, you would use _____ test.
- c) The mean value of the F is approximately equal to _____.

(II) (4 points) For a difference between two variances test, the following information is given:

Sample 1: $s_1 = 8\sqrt{2}$, $n_1 = 23$, sample 2: $s_2 = 9\sqrt{2}$, $n_2 = 16$, Two-tailed

- a) Find the critical value. Use $\alpha = 0.01$
- b) Compute the test value
- c) Approximate the P -value.

(III) (1 point) What is the rank of 7 in the following data?

12, 10, 6, 2, 7, 5, 7, 4, 5, 7, 7, 6, 9

(IV) (3 points) In a Wilcoxon Rank Sum test, $n_1 = n_2 = 20$, and $R = 345$.

- a) Compute the test statistic.
- b) Find the critical value(s). Use $\alpha = 0.1$
- c) Find the P -value.

Q4 (4 points) (I) Given that, $\sum_{i=1}^7 (y'_i - \bar{y})^2 = 91.2$ and $\sum_{i=1}^7 (y - y'_i)^2 = 15.3$

a) Calculate and interpret the coefficient of determination.

b) Calculate the standard error of the estimate.

(II) **(2 points)** Given that,

$$\sum_{i=1}^8 X_i = 56 \quad \sum_{i=1}^8 X_i^2 = 536 \quad \sum_{i=1}^8 Y_i = 605 \quad \sum_{i=1}^8 Y_i^2 = 47887 \quad \sum_{i=1}^8 X_i Y_i = 3726.$$

Obtain the equation of the best fitting line.

(III) **(4 points)** In a Kruskal-Wallis test, $n_1 = \dots = n_{10} = 8$, and $H = 20.5$

a) Find the critical value. Use $\alpha = 0.01$

b) Approximate the P -value.

c) Make the decision.

Good-Luck