



Prince Sultan University

STAT 271

First Examination

Second Semester 2012-2013, Term 122

Wednesday, February 27th, 2013

Dr. Khaled Manasrah

Time Allowed: 90 minutes

Maximum points: 40 points

Name: _____ **ID Number:** _____
(First) (Middle) (Last)

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. Work in a neat and well-organized manner. Show your work on all problems. Please indicate your final answers clearly.
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	Points Earned
1, 2, 3	12	
4, 5, 6	14	
7, 8	14	
Total	40	

- 1) (4pts) Rector, Dr. Ahmed Yamani, wants to use the mean of a random sample to estimate the average amount of time students take to get from one class to the next, and he wants to be 99% confident that the estimate is accurate within 0.25 minute. Assume that it is known from the past that population standard deviation is 1.40 minutes, how large a sample will he have to take?

- 2) (6pts) A random sample has been taken from a normal population with known variance and a 95% confidence interval about the mean is found to be $20.6 < \mu < 22.6$.
 - a) Explain what the phrase 95% confidence interval means.

 - b) What is the value of the sample mean?

 - c) Construct a 90% confidence interval about the mean using the same data obtained from the same sample.

- 3) (2pts) Suppose that we are testing $H_0 : \mu = 5$ versus $H_1 : \mu \neq 5$. Calculate the p-value for the test statistics $z = -1.53$.

- 4) (2pts) Suppose that we are testing $H_0 : \mu = 0$ versus $H_1 : \mu < 0$ with a sample size of 10. Calculate bounds on the p-value for the test statistics $t = -2.59$.
- 5) (2pts) Suppose that we are testing $H_0 : p = 0.45$ versus $H_1 : p > 0.45$. Calculate the p-value for the test statistics $z = 1.53$.
- 6) (10pts) The freshness of produce at Carrefour supermarket is rated on a scale 1 to 5, with 5 being very fresh. From a random sample of 25 customers, the average score was 3.5 with a standard deviation of 0.8.
- a) Obtain a 95% confidence interval for the population mean (the mean score for all customers).
- b) Test the claim that the average score is less than 3.7 at $\alpha = .05$ level.

7) (4pts) A random sample of 15 automobiles was selected, and the lifetime (in months) of the batteries was measured. The variance of the sample was 8.6 months. Find the 90% confidence interval of the true variance.

8) (10pts) An airline claims that only 6% of all lost luggage is never found. If, in a random sample, 17 of 200 pieces of lost luggage are not found.

a) Is there sufficient evidence to conclude that the proportion higher than 6% at $\alpha = .01$?

b) Obtain a 99% confidence interval for the population proportion.