



**Prince Sultan University**  
**STAT 271**  
**Final Examination**  
**Second Semester 2011/2012, Term 112**  
**Tuesday, 29<sup>th</sup> May 2012**  
**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 **6** problems, some with several parts. Make sure that your paper has all these problems

| Problem | Max points | Student's Points |
|---------|------------|------------------|
| 1,2     | 10         |                  |
| 3,4     | 14         |                  |
| 5       | 9          |                  |
| 6       | 7          |                  |
| Total   | <b>40</b>  |                  |

**Q1 (5 points)** An insurance company states that 90% of its claims are settled within 30 days. A consumer group selected a random sample of 75 of the company's claims to test this statement. If the consumer group found that 57 of the claims were settled within 30 days, do they have sufficient reason to support their contention that less than 90% of the claims are settled within 30 days? Use  $\alpha = 0.05$ . What is the  $P$ -value of the test?

**Q2 (5 points)** A study in Pediatric Emergency Care compared the injury severity between younger and older children. One measure reported was the Injury Severity Score (ISS). The standard deviation of ISS scores for 37 children 8 years or younger was 23.9, and the standard deviation for 36 children older than 8 years was 6.8. Assume that ISS scores are normally distributed for both age groups. At the 0.01 level of significance, is there sufficient reason to conclude that the standard deviation of ISS scores for younger children is larger than the standard deviation of ISS scores for older children?

**Q3 (7 points)** A survey of randomly selected travelers who visited the service station restrooms of a large U.S. petroleum distributor showed the following results:

| Gender of Respondent | Quality of Restroom Facilities |         |               |
|----------------------|--------------------------------|---------|---------------|
|                      | Above Average                  | Average | Below Average |
| Female               | 7                              | 24      | 28            |
| Male                 | 8                              | 26      | 7             |

Using  $\alpha = 0.05$ , does the sample present sufficient evidence to reject the hypothesis “Quality of responses is independent of the gender of the respondent?”

**Q4 (7 points)** Each student in a sample of 10 was asked for the distance and the time required to commute to college yesterday. The data collected are shown in the table.

|          |   |    |    |    |    |    |    |    |    |    |
|----------|---|----|----|----|----|----|----|----|----|----|
| Distance | 1 | 3  | 5  | 5  | 7  | 7  | 8  | 10 | 10 | 12 |
| Time     | 5 | 10 | 15 | 20 | 15 | 25 | 20 | 25 | 35 | 35 |

(a) Calculate the correlation coefficient between the two variables.

(b) Test for a significant correlation at the 0.05 level of significance.

(c) Find and interpret the coefficient of determination.

**Q5 (9 points)** Random samples of 2009 pickup trucks with 4-cylinder, 5-cylinder, 6-cylinder, and 8-cylinder engines were obtained. Each pickup truck was tested for miles per gallons in highway driving.

| 4 Cyl (H) | 5 Cyl (H) | 6 Cyl (H) | 8 Cyl (H) |
|-----------|-----------|-----------|-----------|
| 24        | 21        | 19        | 20        |
| 23        | 21        | 19        | 19        |
| 22        | 23        | 19        | 19        |
| 24        | 21        | 18        | 20        |
| 24        | 18        | 21        | 16        |
| 23        | 22        | 20        | 18        |
| 23        | 23        | 19        | 15        |
| 24        | 18        | 20        | 21        |
| 24        | 20        | 19        |           |
| 23        | 20        | 19        |           |

Use ANOVA to test for any significant differences between the MPG for pickup trucks for the four engine sizes. Use  $\alpha = 0.01$

**Q6 (7 points)** An experiment, designed to compare three methods for preventing corrosion, yielded the following maximum depths of pits (in thousandths of an inch) in pieces of wire subjected to the respective treatments:

|          |    |    |    |    |    |    |    |
|----------|----|----|----|----|----|----|----|
| Method A | 77 | 54 | 67 | 74 | 71 | 66 |    |
| Method B | 60 | 41 | 59 | 65 | 62 | 64 | 52 |
| Method C | 49 | 52 | 69 | 47 | 56 |    |    |

Use the  $H$  test to test the null hypothesis that the three samples come from identical populations. Use  $\alpha = 0.05$ .

**Good-Luck**