Prince Sultan University
STAT 271
Final Examination
Second Semester 2012-2013, Term 122
Saturday, May 25th, 2013
Dr. Khaled Manasrah

Time Allowed: 120 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 **7** problems, some with several parts. Make sure that your paper has all these problems.

Problem	Max Points	Points Earned
1, 2	9	
3,4	14	
5,6	12	
7	5	
Total	40	

1) Several years ago, most doctors believed that it was not necessary to take any dietary supplement. Now, because many people do not eat a healthy, balanced diet, many physicians recommend a once-a-day multivitamin. A random sample of people was obtained, and they were asked whether they regularly take a multivitamin. The data are given in the following table

Group	Sample size	Number who take a multivitamin
Men	490	181
Women	428	214

a) (5pts) Is there any evidence that the proportion of women who take a multivitamin is greater than the proportion of men? Use $\alpha = 0.05$

b) (2pts) Find the 99% confidence interval for the true proportion of men who do **not** take multivitamin.

2) a) (1pt) Find the p-value when $\chi^2 = 10.215$, $n = 25$ and the test is left tailed.

b) (1pt) For the test in part (a) would you reject or fail to reject null hypothesis at $\alpha = 0.05$? Explain.

3) The average income of 11 families who lives in Riyadh city is 62,456 Riyal, with standard deviation 9652 Riyal. The average income of 15 families who lives in Jeddah is 60,213 Riyal, with standard deviation of 2009 Riyal.
   a) (2pts) Find the 95% confidence interval for the true mean of the families who lives in Riyadh.

   b) (5pts) At $\alpha = 0.01$level of significance, can a difference in variances be concluded?

4) (7pts) A marketing manager at Hertz Car Rental Company believes that the number of miles a customer drives per week is related to the type of car rented. Independent random samples of week-long rental reservations were obtained, and the number of miles driven was recorded for each car in the following table.

Compact car	Standard car	Luxury car
700	600	400
950	820	500
820	910	700
875	990	650
925	995	

Is there any evidence to suggest that the populations are different? Use $\alpha = 0.05$.

5) (6pts) As part of the Mathematics Assessment, PSU students were asked about the frequency with which they used calculators while taking tests. The results for national colleges were as follows: never, 28%; sometimes, 51%, and always, 21%. A random sample of 140 PSU students indicated that 30 said never, 78 said sometimes, and 32 said always. At $\alpha = 0.05$ do these proportions differ from the national report?

6) A potential purchaser of a used Honda Civic decided to collect data from the newspaper on advertised price and age. Price is reported only to the nearest thousand of Riyals.

Age (years)	Price (thousands)
6	18
5	27
4	24
3	30
2	33
2	36
1	33
1	39

a) (1pt) Compute the correlation coefficient.

b) (1pt) Give a brief explanation of the type of relationship based on the correlation coefficient.

c) (1pt) Determine the regression line equation.

d) (3pts) Find the 90 % prediction interval when $x = 7$ years

7) (5pts) A study has been made to compare the mean monthly salary of the employees in 4 banks (SABB, Al Rajhi, Samba, Al Jazira). A completely randomized design has been used for this study. The ANOVA table of this study is given below:

Source	Sum of Squares	df	Mean Square	F
Between	?	?	?	?
Within	?	16	123750	
Total	2168000	?		

a) Complete the ANOVA table above.

b) Do the data provide sufficient evidence to indicate a difference in the mean monthly salaries among the banks? Use $\alpha = .05$.