Prince Sultan University
STAT 271
Second Examination
Second Semester 2012-2013, Term 122
Wednesday, April 17, 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 **6** problems, some with several parts. Make sure that your paper has all these problems.

Problem	Max Points	Points Earned
1, 2, 3	14	
4, 5	11	
6	15	
Total	40	

1) (2pts) Find **only** the **critical value** for a two-tailed F test with $\alpha = 0.01$ when sample 1 has $s_1^2 = 128$, $n_1 = 23$ and sample 2 has $s_1^2 = 162$, $n_1 = 16$.

2) (6pts) The number of carbohydrates found in a random sample of fast-food entrees is listed below. Is there sufficient evidence to conclude that the variance differs from 100 at $\alpha = 0.05$ level?

53 46 30 41 39 43 39 38 73 47

3) (6pts) Prince Sultan University looked at possible differences in the proportions of female and male students who succeed (received a C or better) in STAT 271 last semester. They found that 26 of the 40 women and 36 of the 60 men had succeeded. Is there evidence of a difference between the proportions of women and men who had succeeded at $\alpha = 0.05$ level? Use the p-value approach.

4) A sample of 46 Engineering majors at Prince Sultan University has a mean GPA of 3.37 and a standard deviation of 0.336 while a sample of 51 Business majors has a mean GPA of 3.24 and a standard deviation of 0.449.

a) (5pts) Test the claim Engineering majors on average have a higher GPA than Business majors at $\alpha = 0.05$ level.

b) (3pts) Construct a 99% confidence interval for the difference in the mean between Engineering and Business Majors.

5) (3pts) A sunglass company wants potential customers to compare two types of lenses, the current lens A and one made of a new hi-tech material B. Each person, in a sample of 33, is asked to wear one of each type for a whole day. After a day in the sun, they are asked to score that day's pair on a scale of 1 to 7, with higher scores being best. The differences in scores (hi-tech lens B)-(current Lens A) have mean 0.7 and variance 3.8. Construct a 95% confidence interval for the mean difference.

6) (15pts) Ahmed's parents are concerned that he seems short for his age. Their doctor has the following record of Ahmed's height:

Age (months)	18	21	24	27	30
Height (cm)	76	78	82	84	86

a) Make a scatter plot of the data.

b) Is the pattern roughly linear?

c) Find the linear regression line equation of height y on age x.

d) Plot the regression line equation on the scatter plot you did in part (a).

e) What is Ahmed's height of growth, in centimeter per month?

f) Predict Ahmed's height at 24 months.

g) Find the residual when $x = 24$ months

h) Test the significant of the correlation coefficient at $\alpha = 0.05$ level.

i) Would you be willing to use the regression line you obtained in part (c) to predict Ahmed's height at age 21 years? Explain your answer.

j) Normally growing boys gain about 6cm in height between ages 2 (24 months) and 3 (36 months). What rate of growth is this in centimeter per month? Is Ahmed growing more slowly than normal?