KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

DHAHRAN, SAUDI ARABIA

STAT 201: INTRODUCTORY STATISTICS

Third Exam, Term 121
Time: 5.15- 6.45 p.m., Sunday December 16, 2012

Student Surname: ID#

You are allowed to use electronic calculators and other reasonable writing accessories that help write the exam. Try to define events, formulate problem and solve.

Do not keep your **mobile** with you during the exam, turn off your mobile and leave it aside.

Question No	Full Marks	Marks Obtained
1	16	
2	14	
3	12	
4	18	
Total	60	

Note: You may assume $\alpha = 0.05$ for testing and 95% for confidence interval estimation if not otherwise stated.

Q1. A survey was instituted to estimate the mean salary of middle level bank executive. A random sample of 15 executive yielded the following yearly salaries (in units of $1000)

88 121 77 39 52 102 95 78 69 82 80 84 72 115 106

a) (7 points) Calculate and ***interpret*** a 95% ***confidence interval*** for the mean salary of middle level bank executive.

b) (7 points) Test the hypothesis that the mean salary of middle level bank executive is more than 80.

c) (2 points) Determine the sample size to estimate the population mean to be within ±5 with 99% confidence level.

Q2. A market research firm is interested in determining the proportion of households that are watching a particular sporting event. To accomplish this task, it plans on using a telephone poll of randomly chosen households.

a) (2 points) How large a sample is needed if the company wants to be 90 percent certain that its estimate is correct to within ±0.02?

Suppose there is a sample whose size is the answer in part (a). If 23 percent of the sample were watching the sporting event

b) (8 points) Using the p – value approach, do you think that the percentage of the households that are watching a particular sporting event is less than 24 percent?

c) (4 points) Construct and ***interpret*** a 98 percent ***confidence interval*** for the proportion of households that are watching a particular sporting event.

Q3. An automobile insurance company selected random samples of 300 single male policyholders and 300 married male policyholders who had reported accidents at some time within the past 3 years. The resulting data were that 19% of the single policyholders and 12% of the married ones had reported an accident.

a. (5 points) Estimate the true difference between the two population proportions in these two types of policyholders using 95% ***confidence interval***. Would you agree with the claim that there is a different in these two types of policyholders?

b. (7 points) Does this establish, at 10% level of significant, that there is a different in these two types of policyholders?

Q4. Forty workers were randomly divided into two sets of 20 each. Each set spent two weeks in a self - training program that was designed to teach a new production technique. The first set of workers was accompanied by a supervisor whose only job was to check that the workers were all paying attention. The second group was left on its own. After the program ended, the workers were tested. The following results were as follows:

	Sample Mean	**Sample St. Dev.**
Supervised group	70.6	8.4
Unsupervised group	77.4	7.4

a) (10 points) Estimate the true difference between the two population means using 95% confidence interval. Would you agree with the claim that supervision had no effect on the performance of the workers? What assumptions are necessary for your analysis

b) (8 points) Does the data provide evidence for concluding that supervision had no effect on the performance of the workers? Test the appropriate hypotheses using 1% level of significance. What would you conclude was the result of the supervision?