KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA

STAT 212: Statistics for Business II
Semester 161
First Major Exam
Wednesday October 19, 2016
7:00 pm

Please circle your instructor's name:

Abbas Al-Sawi

Name: ID #: Section #: Serial #:

Question No	Full Marks	Marks Obtained
1	**08**	
2	**07**	
3	**13**	
4	**07**	
5	**10**	
Total	**45**	

Q.No.1:- (8 points) To test the effectiveness of a business school preparation course, 8 students took a general business test before and after the course. The results are given below.

Test whether the preparation course is affective or not i.e. the exam scores have improved significantly or not. Use the suitable hypothesis testing methodology and write down all the steps involved. Also, mention all the assumptions you made.

Student	Exam Score before Course	Exam Score After Course
1	530	670
2	690	770
3	910	1000
4	700	710
5	450	550
6	820	870
7	820	770
8	630	610

Q.No.2:- (7 points) Online magazines make it easy for readers to link to an advertiser's website directly from an advertisement placed in the digital magazine. A recent survey indicated that 56% of online magazine readers have clicked on an advertisement and linked directly to the advertiser's website. The survey was based on a sample size of $n = 100$. Use the critical value approach to determine whether there is evidence that more than half of all the readers of online magazines have linked directly to an advertiser's website. (Use the 0.03 level of significance.) Show your work and test the assumptions.

Q.No.3:- (6+7 = 13 points) An important feature of digital cameras is battery life, the number of shots that can be taken before the battery needs to be recharged. The battery life of 30 subcompact cameras was noted with a mean of 234.6 and a standard deviation of 49.2. Similarly, the battery life of 16 compact cameras was noted and it gave a mean of 303.1 and a standard deviation of 112. Assuming that the two samples are selected from independently normally distributed populations

(a) At 5% level of significance, is there evidence of a difference between the two population variances?

(b) Using the conclusion of part (a), test whether there is a difference in the mean battery life of the two types of digital cameras. Write down all the steps of testing procedure.

Q.No.4:- (7 points) An appliance manufacturer claims to have developed a compact microwave oven that consumes a mean of no more than 250W. From the previous studies, it is believed that power consumption for microwave ovens is normally distributed. A consumer group has decided to try to discover if the claim appears true. They take a sample of 20 microwave ovens and find that they consume a mean of 247W with a standard deviation of 15W. Using the p-value approach, test the claim of the manufacturer at level of significance $\alpha = 0.05$. Write down all the assumptions and the steps of testing procedure.

Q.No.5:- (2+3+3+2 = 10 points) A quality control engineer is in charge of the manufacture of USB flash drives. Two different processes can be used to manufacture the flash drives. He claims that the Kohler method produces a greater proportion of defects than the Russell method. He samples 150 of the Kohler and 200 of the Russell flash drives and finds that 27 and 18 of them, respectively, are defective. If Kohler is designated as "Group 1" and Russell is designated as "Group 2"

(a) Write down the appropriate null and alternative hypotheses.

(b) What is the test statistic? Calculate its value.

(c) Using a level of significance equal to 0.01, is the claim of quality control engineer true? Justify your answer by using critical value approach.

(d) Do you need any assumptions in parts (a), (b) and (c)? If yes, what? If no, why?