KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS
Term 152

STAT 212 BUSINESS STATISTICS II
Second Major Exam
Allowed time 75 minutes
Wednesday March 23, 2016

Name:_____ ID #:_____ Section #:_____ Srl #:___

Important Note:

1) You must **show all work** to obtain full credit for questions on this exam.
2) **DO NOT round** your answers at each step. Round answers only if necessary at your final step to **4 decimal places**.

Question No	Full Marks	Marks Obtained
Q1	11	
Q2	7	
Q3	17	
Q4	25	
Total	**60**	

Question One (11 *points*):

A manufacturer of a certain product has three factories located across the country. There are three major causes of defects in this product, which we will identify as A, B, and C. During a recent week the reported occurrences of product defects in the three factories were as shown in the Minitab output below:

Chi-Square Test: A, B, C

Expected counts are printed below observed counts
Chi-Square contributions are printed below expected counts

	Product defect			
Factory	A	B	C	Total
1	15	25	23	63
	0.258	1.551	0.438	
2	10	12	21	43
	0.239	0.129	0.493	
3	32	28	44	104
	0.504	0.546	0.004	
Total	57	65	88	210

Chi-Sq = [ ], DF = [ ]

a. Complete the table above. (9 *points*)

b. Based on the frequencies in the table before, can you conclude that the defect patterns in the different factories are the same? (7 *points*)

H_0: H_1:

Assumption(s):

Test Statistic:

Critical value:

Decision rule:

Decision:

Conclusion:

Question Two (7 *points*):

Total daily sales at a small food store are known to average \$452.80 and to have a standard deviation \$55.00. The store's management recently implemented some changes in displays of goods and it wants to know whether the sales' variation has changed. A random sample of 12 days shows a standard deviation of \$65.00. Using $\alpha = 0.05$, is the sampling result significant? Explain.

H_0: H_1:

Assumption(s):

Test statistic:

Critical value:

Decision rule:

Decision:

Conclusion:

Question Three (17 *points*):

The following data are from charts in a business article.

Year	1992	1993	1994	1995	1996	1997
Italy's Deficit/GDP Ratio (%)	9.5	9.4	7.5	6.5	4.0	6.0
Lira/Mark *e*-rate	925	970	1050	1100	1020	980

a. Compute the best fit equation for predicting the Lira/Mark *e*-rate. (6 *points*)

b. Interpret the coefficients of the best fit equation. (3 *points*)

c. Compute the error in estimating the Lira/Mark *e*-rate given that Italy's Deficit/GDP ratio is 7.5%.
(3 *points*)

d. Compute a 99% interval estimate for the mean Lira/Mark *e*-rate given that Italy's Deficit/GDP ratio is 7.5%. (5 *points*)

Question Four (25 points):

Suppose the following data are available on Manufacturer's Market Share (MMS) (X), in percentage, and the product quality (Y), on a scale of 0 to 100, determined by an objective evaluation procedure:

$\sum_{i=1}^{13} x = 738$, $\sum_{i=1}^{13} y = 98$, $\sum_{i=1}^{13} x^2 = 45580$, $\sum_{i=1}^{13} y^2 = 878$, and $\sum_{i=1}^{13} xy = 6251$
$\sum_{i=2}^{13} e_i^2 = 27314.32587$ and $\sum_{i=2}^{13} (e_i - e_{i-1})^2 = 56939.44378$

Answer the following showing the details of your solutions:

a. Compute the correlation coefficient and interpret its meaning. (5 *points*)

b. Using $\alpha = 0.005$, is there evidence that the Manufacturer's Market Share (MMS) and the product quality are positively related? (7 *points*)

c. What is/are the assumption(s) NEEDED to answer part b above? (3 *points*)

d. Compute the coefficient of determination and interpret it. (3 *points*)

e. Do you thing the assumption of independence, of the residuals, is satisfied? Explain in detail. (7 *points*)

With My Best Wishes