KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS
Term 162

STAT 212 BUSINESS STATISTICS II
Second Major Exam
Allowed time 90 minutes
Wednesday April 12, 2017

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	14	
Q2	12	
Q3	7	
Q4	27	
Total	**60**	

Question One (14 *points*):

A medical researcher is interested in determining if there is a relationship between adults over 50 who exercise regularly and low, moderate, and high blood pressure. A random sample of 236 adults over 50 is selected and the results are given below.

	Blood Pressure		
Activity	Low	Moderate	High
Reg. Exercise	**39** 29.8983 2.7708	**62** _____ _____	**25** _____ 0.3841
No Reg. Exercise	**17** 26.1017 _____	**65** _____ 0.5693	**28** _____ 0.4399

Notes: 1. Second line in the cell shows the expected frequency.
2. Third line in the cell shows the chi-squared contribution.

Use 2.5 % significance level to support the claim that the percentage of regular-exercisers among the three levels of blood pressure is not the same. (12 *points*)

H_0: H_1:
Assumption(s):
Test Statistic:
Critical value:
Decision rule & Decision:

Question Two (12 *points*):

Referring to question one and the *partial* Excel output below,

a. Complete the table. Justify your calculations.
b. Which pair of Blood pressure levels is significantly different at the 2.5 % level? Justify your answer.

Blood Pressure	Sample Proportion	Sample Size
L	0.696	
M		127
H	0.472	53

Comparison	Absolute Difference	Std. Error of Difference	Critical Range
L to M	0.208	0.0758	
L to H			0.250
M to H		0.0817	0.2822

Question Three (7 *points*):

A researcher wants to determine whether there is a difference between two sunscreen lotions. Participants in a marathon race on a hot, sunny day applied lotion A to one arm and lotion B to the other arm. The results are shown in the table.

	Lotion A	
Lotion B	No burn (Success)	Burn (Failure)
No burn (Success)	737	40
Burn (Failure)	50	79

Is there a difference in the effectiveness of the two lotions in preventing sunburn? Use $\alpha = 0.05$ level of significance.

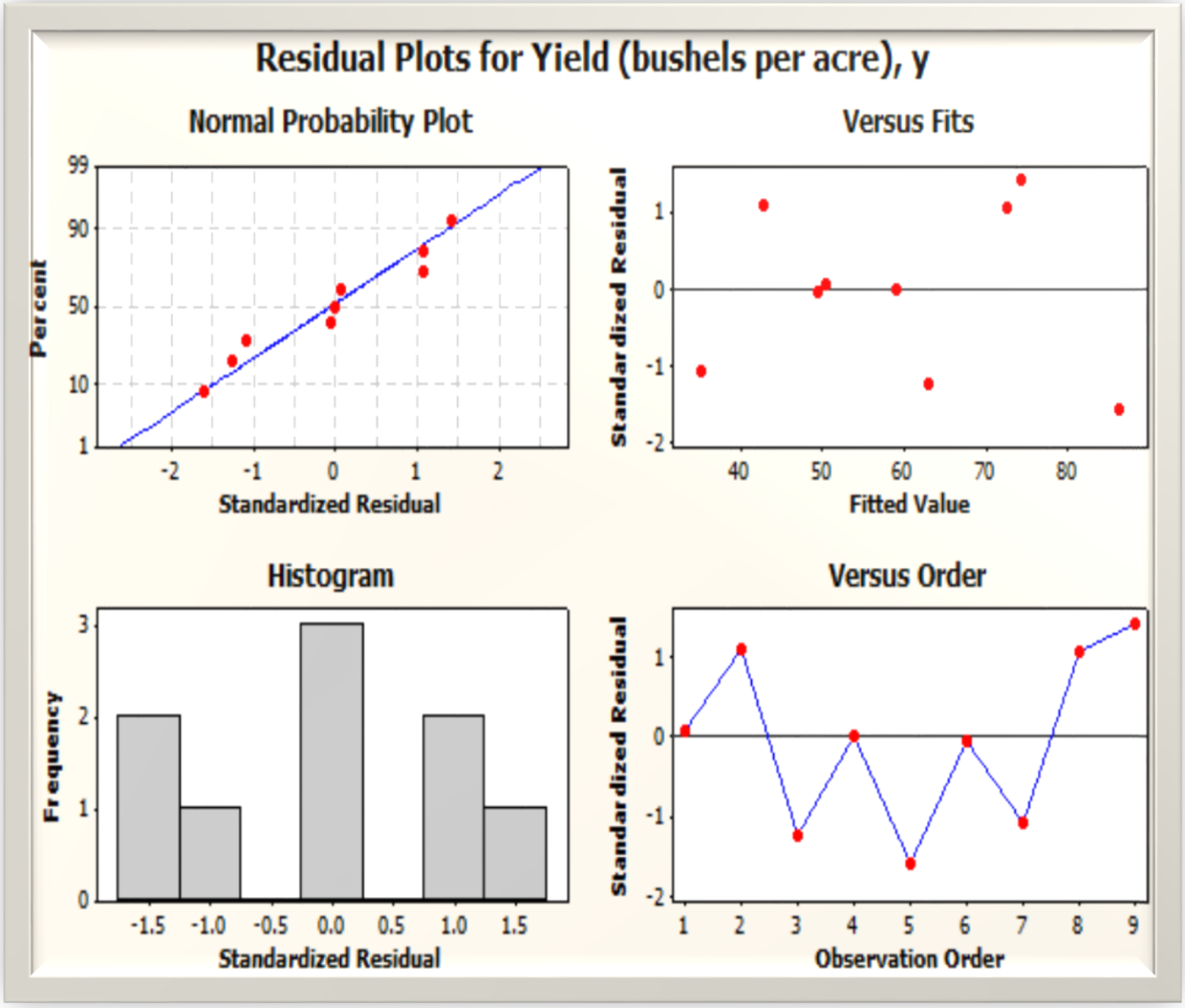
H_0: H_1:
Assumption(s):
Test Statistic:
Critical value:
Decision rule & Decision:
Conclusion:

Question Four (27 points):

In an area of the Great Plains, records were kept on the relationship between the rainfall (in inches) and the yield of wheat (bushels per acre). Following is a sample of 9 observations:

Rainfall (in inches), x	10.5	8.8	13.4	?	18.8	10.3	7	15.6	16
Yield (bushels per acre), y	50.5	46.2	58.8	?	82.4	49.2	31.9	76	78.8

S_{xx}= 115.1222, S_{yy}= 2294.82, S_{xy}= 504.13, $\bar{x}$=12.5444, $\bar{y}$= 59.2



Using the given information and the graphs above answer the following:

a. Estimate the least squares regression model.

b. Find the standard error of estimate.

c. What is your conclusion about the Normality assumption? Explain using the graphs above.

d. Construct a 99% confidence interval about the slope of the true least-squares regression line. Interpret the results.

e. A research believes that the Yield increases by 5 bushels per acre, on average, when the rainfall increases by 1 inch. Do you agree with him? Explain.

f. Estimate the average yield when the rainfall level is 10.3 inches. Also compute the residual.

g. Construct a 95% confidence interval about the mean value of y, the yield, given $x = 10.3$ inches.

With Our Best Wishes