KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS
Term 151

STAT 212 BUSINESS STATISTICS II
Second Major Exam
Allowed time 75 minutes
Wednesday October 28, 2015

Please circle your instructor name:

R. Anabosi M. Saleh

Name:_____ ID #:_____ 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	19	
Q2	9	
Q3	19	
Q4	13	
Total	**60**	

Question One (19 points):

It might be thought that shoppers prefer Saturday to other days of the week for their shopping. A study showed the results for 200 shoppers surveyed in each of the three age groups. The percentages are shown in the table below:

	Age		
Major shopping day	Under 35	35-54	Over 54
Saturday	24%	28%	12%
Not a Saturday	76%	72%	88%

Using the Excel partial output below

Expected Frequencies				
	Column variable			
Row variable	C1	C2	C3	Total
R1		42.66667		
R2	157.3333			
Total				

(fo-fe)^2/fe		
0.666667	4.166667	8.166667
0.180791	1.129944	2.214689

a. Complete the table in the output above. (4 points)

b. Is there evidence of a significant difference among the age groups with respect to major grocery day? (use 1% level of significance) (7 points)

H_0: H_1:

Assumption(s):

Test Statistic:

Critical value:

Decision rule:

Decision:

Conclusion:

c. Assume that there is at least one different age group, and then find the different age group(s). (8 points)

Question Two (9 points):

The personnel manager of a large department store wants to reduce absenteeism among sales associates. She decides to institute an incentive plan that provides financial rewards for sales associates who are absent fewer than 5 days in a given calendar year. A sample of 100 sales associates selected at the end of the second year reveals the following:

	Year 2	
Year 1	<5 days absent	≥5 days absent
<5 days absent	**32**	**4**
≥5 days absent	**25**	**39**

a. At the 3% level of significance, is there evidence that the proportion of employees absent fewer than 5 days was lower in year 1 than in year 2? (7 *points*)

H_0: H_1:

Assumption(s):

Test statistic:

p-value:

Decision rule:

Decision:

Conclusion:

b. Interpret the meaning of the *p*-value found in part (a). (2 *points*)

Question Three (19 points):

The value of a sport franchise is directly dependent on the amount of revenue that a franchise can generate. The data in the table below represent the value in 2005 (in millions of dollars) and the annual revenue (in millions of dollars) for 11 baseball franchises.

Team	**Value**	**Revenue**
Anaheim	368	157
Baltimore	359	156
Boston	617	206
Chicago White Sox	315	157
Cleveland	352	150
Detroit	292	146
Kansas City	239	117
Minnesota	216	114
New York Yankees	1026	277
Oakland	234	134
Seattle	428	179
Total	**4446**	**1793**

Given the partial Excel output below:

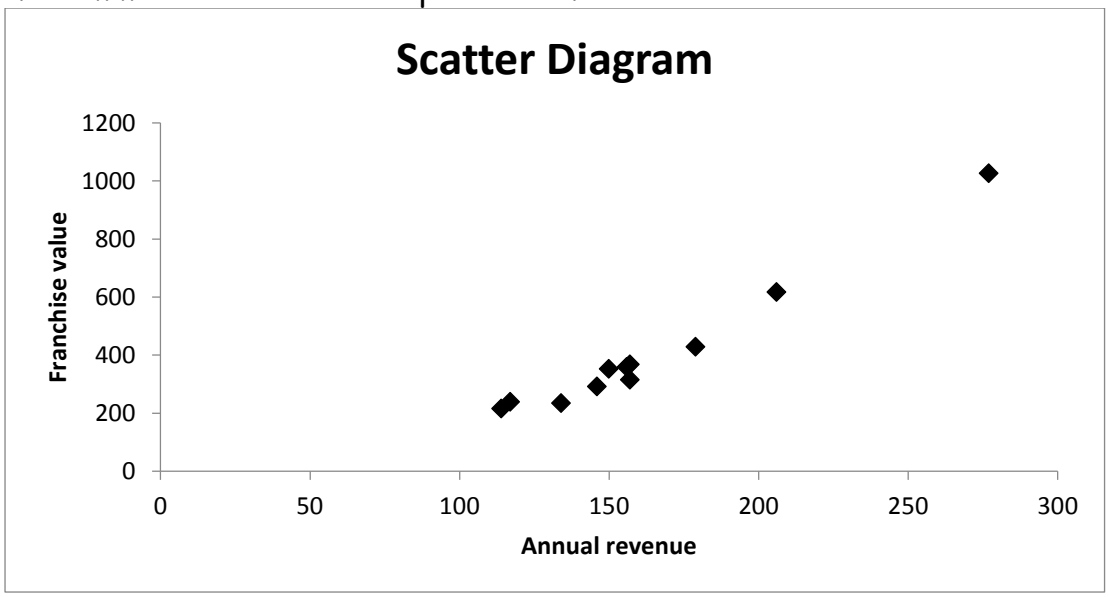
ANOVA

	df	SS	MS	F	Significance F
Regression	1	532349.348	532349.348	259.8475546	6.02738E-08
Residual	9	18438.28833	2048.698703		
Total	10	550787.6364			

	Coefficients	Standard Error	t Stat	P-value
Intercept	-415.7613323	52.66457653	-7.894515815	2.46072E-05
Revenue	5.030326077	0.312059078	16.11978767	6.02738E-08

Answer the following:

a. Comment on the scatter plot below. (3 *points*)



b. Estimate the franchise value of Baltimore team and find the error of estimation.(3 *points*)

c. Interpret the meaning of the slope of the regression line in the context of this problem. (3 *points*)

d. At 1% significance level, is there evidence that there is a direct relationship between the franchise average value and the annual revenue generated? (6 points)

e. Compute a 99% interval estimate for the franchise value of Baltimore. (4 points)

Question Four (13 points):

A company that holds the DVD distribution rights to movies previously released only in theatres wants to estimate sales of DVD's (in thousands) based on box office success (in $millions). Given the following data summary:

$\sum_1^{30} x$ = 1977.76, $\sum_1^{30} y$ = 4366.24 , $\sum_1^{30} xy$ = 327424.76,

$\sum_1^{30}(x-\bar{x})^2$ = 9134.07375 , and $\sum_1^{30}(y-\bar{y})^2$ = 235654.2023

Answer the following showing the details of your solutions:

a. Compute the correlation coefficient and interpret its meaning. (4 *points*)

b. At the 2.5% level of significance, is there evidence that the sales of DVD's does not increase as the box office gross increases? (7 points)

c. Compute the percentage of variation in the DVD's sales that is explained by the variation in box office gross. (2 points)