STA 5172 Practice Midterm 2

March 20, 2014

Name:

FSUID:

Please sign the following pledge and read all instructions carefully before starting the exam.

Pledge: I have neither given nor received any unauthorized aid in completing this exam, and I have conducted myself within the guidelines of the University Honor Code.

Signature: _____

INSTRUCTIONS:

- This is an open-book, open-notes exam. You can refer to your notes, the text, or any other books. You may use a calculator. Normal / t table values will be provided in the actual test.
- Total time is 75 minutes (9:30 A.M to 10:45 A.M.)
- **Show all work**, clearly and in order, if you want to receive full credit. When you use your calculator, explain all relevant mathematics. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Circle or otherwise indicate your final answers.
- **Answer all the questions in the space provided. You may attach additional sheets if necessary.**
- This test has 4 problems and is worth 80 points. It is your responsibility to make sure that you have all of the problems.
- **Good luck!**

Prob. No.	Max Points	Earned Pts.
1	20	
2	20	
3	20	
4	20	

TOTAL: _____

Question 1. (20 pts.) Stock Prices, Y, are assumed to be affected by the annual rate of dividend of stock, X. A simple linear regression analysis was performed on 20 observations and the results obtained is

Independent Variable	Regression Coefficient	Standard Error (Ho: B=0)	T-Value	Prob Level
INTERCEPT	-7.964633	3.11101359	-2.560	0.0166
X1	12.548580	1.27081204	9.874	0.0001

Circle the correct answer.

1. What statistical conclusion should you make about the effect of the dividend on average stock price?
   A. Since 11.30869 > table value, reject the null hypothesis.
   B. Since 12.54858 > table value, reject the null hypothesis.
   C. Since 9.874 < table value, reject the null hypothesis.
   D. Since 9.874 > table value, reject the null hypothesis.
   E. Since 0.7895 < table value, fail to reject the null hypothesis.

2. What is the 95% confidence interval for a value of Y given an X value of 2.36? You are given the standard error of this estimate is 3.351. I am 95% confident that
   A. the stock price for a stock with a dividend rate of 2.36% falls between 14.61 and 28.69.
   B. the mean stock price for all stocks with a dividend rate of 2.36 % falls between 14.61 and 28.69.
   C. the variance in stock price for all stocks falls between 14.61 and 28.69.
   D. the dividend rate for all stocks falls between 14.61 and 28.69.
   E. for each one point increase in dividend rate, the stock price will increase from 14.61 and 28.69

3. Which one of the following assumptions is incorrectly stated?
   A. The stock price is normally distributed for any dividend rate.
   B. The stock price has the same variability for any dividend rate.
   C. The stock price for any dividend rate is a linear function of dividend rate.
   D. The difference between the stock price and the expected stock price
   given the dividend rate is independent from company to company.

4. The interpretation of 0.7895, the value of R-square is
   A. 78.95% of the sample stock prices (around the mean stock price) can be attributed to a linear relationship with the dividend rate in the population.
   B. the mean stock price will be estimated to increase 97.50 for each point increase in the rate.
   C. the mean stock price will be increase 78.95 for each point increase in the rate.
   D. the stock price will increase 78.95 for each point increase in the rate.
   E. 78.95% of the sample variability in stock price (around the mean stock price) can be attributed to a linear relationship with the dividend rate.

5. What is the estimate of the change in expected stock prices when the dividend rate increases by one point?
   A. 97.50
   B. -7.964633
   C. This is a parameter not a statistic.
   D. 12.54858
   E. 5.36546

6. The estimate of the standard deviation of $\hat{\beta}$ is:
   A. 3.36284
   B. 3.14983
   C. 0.39274
   D. 12.54858
   E. 1.27081

Question 2. (20 pts.) A study was conducted among a group of people who underwent coronary angiography. A group of 1493 people with coronary-artery disease were identified and were compared with a group of 707 people without the disease (controls). Risk factor information was collected on each group. Among cases, the mean serum cholesterol was 234.8 mg/dL with standard deviation = 47.3 mg/dL. Among controls, the mean serum cholesterol was 215.5 mg/dL with standard deviation = 47.3 mg/dL. What test is appropriate to determine whether the true mean serum cholesterol is different between the two groups?

Question 3. (20 pts.) Much controversy has risen concerning the possible association between myocardial infarction (MI) and coffee drinking. Suppose the information in Table 1 on coffee drinking and prior MI status is obtained from 200 60-64-year old males in the general population.

Table 1: MI and coffee drinking

Coffee drinking (cups/day)	MI in last 5 years	Number of people
0	Yes	3
0	No	57
1	Yes	7
1	No	43
2	Yes	8
2	No	42
3 or more	Yes	12
3 or more	No	28

Test for the association between history of MI and coffee drinking status, which is categorized as follows: 0 cups, 1 or more cups.

Question 4. (20 pts.)

A comparison is made between demographic characteristics of patients using fee-for-service practices and prepaid group health plans. Suppose the data presented in Table 15.2 are found.

Table 15.2 Characteristics of patients using fee-for-service practices and prepaid group health plans

	Fee-for-service			Prepaid group health plans		
Characteristic	Mean	sd	n	Mean	sd	n
Age (years)	58.1	6.2	57	52.6	4.3	48
Education (years)	11.8	0.7	57	12.7	0.8	48

1. Test for significant difference in the variance of age between the two groups.
2. What is the appropriate test to compare mean ages of the two groups?