COURSE: MSCI 3710 **Print Name:** _____

FINAL EXAM **Signature:** _____

Version A **S.S.#:** _____

SEMESTER: Fall 2000 **Section Number:** _____

Instructions:

- Please print your name, social security number, and section number at the top on this exam. Also, put your signature in the assigned space above.

- On your scantron **PRINT** your name, this exam version, and your section number. To better protect your privacy also print your name on the backside of your scantron.

- You have 100 minutes to complete this exam. The exam is open book, open notes, and open mind. You may use any type of calculator but please show all your work on the exam and **bubble in all answers on the scantron**.

- Many of the questions follow the format of those in Adventures in Business Statistics. The remaining questions are either based on the Excel assignment or use an Adventures-like approach with problems nearly identical to those assigned in the textbook.

- When you leave, please insert your scantron into the exam booklet and turn them in to your instructor at the front desk.

- No cheating.

- Good luck and we wish you well on the exam.

Note: Whenever question(s) are connected you may be asked to assume a result (given a value) from the previous question but this result may or may not be correct. This is to prevent you from losing points on a second question because you made a mistake on a previous question.

Use the information given below to answer the next five questions. (1-5)

The historical mean score on MSCI 3710 mid-term exams is known to be 73 with a standard

deviation of 16. The sample of 400 current mid-term exams gave a mean of 76. Do we have reason to believe that the true mean mid-term score is higher this time? Conduct the appropriate hypothesis test, at the 5% significance level.

1. What are the null hypothesis and alternative hypothesis for this test?

A. Ho: □ = 73 Ha: □ □73
B. Ho: □ □ 73 Ha: □ < 73
C. Ho: □ = 76 Ha: □ □76
D. Ho: □ □ 73 Ha: □ > 73*
E. Ho: □ □ 76 Ha: □ > 76

2. What is the test statistic to be used in this case?

A. z*
B. t
C. X^2
D. H
E. F

3. The decision- rule is to reject Ho if the computed test statistic is:

A. > 6.314
B. > 1.645*
C. > 1.282
D. > 2.576
E. > 1.96

4. What is the calculated value of the test statistic?

A. 0.80
B. -4.00
C. 3.75*
D. 0.1875
E. -0.1875

5. Assuming the calculated value of the test statistic is 4.00, what is the conclusion of the test?

A. Fail to reject the null hypothesis, the true mean is higher this time.
B. Fail to reject the null hypothesis, there is insufficient evidence that true mean is higher this time.
C. Reject the null hypothesis, there is insufficient evidence that true mean is higher this time.
D. Fail to reject the null hypothesis, the true mean is 76.
E. Reject the null hypothesis, the true mean is higher this time.*

Use the information given below to answer the next three questions. (6-8)

To study the effect of an experimental drug, the dissolved protein levels for ten (10) subjects before and after administration of the drug were obtained Assuming that the difference (before-after) numbers can be approximated by a normal distribution, test the claim that the drug is effective in reducing the dissolved protein levels in subjects. Two separate (and different) **Excel** outputs for the tests, each at the 5% significance level, are given below:

t-Test: Paired Two Sample for Means

	before	*after*
Mean	31.4	27.9
Variance	38.26666667	41.21111111
Observations	10	10
Pearson Correlation	0.89926126	
Hypothesized Mean Difference	xxxx	
df	9	
t Stat	3.899602102	
P(T<=t) one-tail	xxxx	
t Critical one-tail	1.833113856	
P(T<=t) two-tail	xxxx	
t Critical two-tail	2.262158887	

t-Test: Two-Sample Assuming Equal Variances

	before	*after*
Mean	31.4	27.9
Variance	38.26666667	41.21111111
Observations	10	10
Pooled Variance	39.73888889	
Hypothesized Mean Difference	xxxx	
df	18	
t Stat	1.241495605	
P(T<=t) one-tail	xxxx	
t Critical one-tail	1.734063062	
P(T<=t) two-tail	xxxx	
t Critical two-tail	2.100923666	

6. What are the decision and conclusion using the **dependent** sample approach if the test is conducted at the 5% significance level?

A. There is insufficient information to decide whether the drug is effective.
B. Fail to reject the null hypothesis, conclude the drug is effective.
C. Fail to reject the null hypothesis, conclude there is insufficient evidence for drug effectiveness.
D. Reject the null hypothesis, conclude the drug is not effective.
E. Reject the null hypothesis, conclude the drug is effective.*

7. What is the conclusion using the **independent** samples approach, at 5% significance level?

A. Conclude the drug is effective because the p-value of the test is larger than 5%.
B. Conclude the drug is effective because the p-value of the test is smaller than 5%.
C. Conclude the drug is effective because the p-value of the test is smaller than the critical (table) value.
D. Conclude the drug is not effective because the p-value of the test is larger than 5%.*
E. Conclude the drug is not effective because the p-value of the test is smaller than 5%.

8. Which of the t-tests is more appropriate for the described scenario?

A. Dependent.*