

COURSE: DSCI 3710

Print Name:

Exam 2 – version A

Signature:

Summer 2010

Student ID#:

INSTRUCTIONS:

- Please print your name and student ID number on this exam. Also, put your signature on this exam.
- On your scantron **PRINT** your name and exam version. To better protect your privacy also print your name on the backside of your scantron.
- You have **120 minutes** to complete this exam. The exam is open book, open notes, and open mind. You may use any type of hand calculator but please show all your work on the exam and mark all answers on the scantron. Usage of cell phones, digital cameras, PDAs, and other communication devices is strictly prohibited.
- Many of the questions follow the format of those in Hawkes Learning Systems Business Statistics. The remaining questions are either based on the Excel assignments or use an HLSBS-like approach with problems nearly identical to those assigned in the textbook.
- Please **DO NOT** pull this exam apart. When you have completed the exam, please turn in your scantron and exam booklet 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) as an answer for the previous question but this result (value) may or may not be correct. The procedure is set in place to prevent you from losing points on a subsequent question because you made a mistake on some previous question/s.

Use the information given below to answer the next 6 questions.

A quality manager wishes to determine if there is a difference in the proportion of nonconforming bottle-top seals produced by two different assembly lines. Of a random sample of 200 bottle-top seals from each line, Line 1 produced 10 nonconforming items and Line 2 produced 14 nonconforming items. Is there a significant difference in the proportion of nonconforming seals produced by the two assembly lines? Use a 0.05 level of significance.

1. What are the null hypothesis and alternative hypothesis for this test?
 - A. $H_0: p_1 = p_2$ $H_a: p_1 \neq p_2$ *
 - B. $H_0: \mu_1 \geq \mu_2$ $H_a: \mu_1 < \mu_2$
 - C. $H_0: p_1 \neq p_2$ $H_a: p_1 = p_2$
 - D. $H_0: p_1 \geq p_2$ $H_a: p_1 < p_2$
 - E. $H_0: \mu_1 = \mu_2$ $H_a: \mu_1 \neq \mu_2$

2. Where is the Reject H_0 region for testing the success of the program?
 - A. $Z > 1.282$
 - B. $Z < 1.645$
 - C. $Z < -1.645$ and $Z > 1.645$
 - D. $Z < -1.96$ and $Z > 1.96$ *
 - E. $Z < -2.33$

3. Assuming the p value (observed level significance) is 0.03, what are the decision and conclusion of the test at the 5% level of significance?
 - A. Fail to reject the null hypothesis, conclude there is sufficient evidence of proportion difference between two lines.
 - B. Reject the null hypothesis, conclude there is evidence of proportion difference between two lines.*
 - C. Fail to reject the null hypothesis, conclude there is insufficient evidence of proportion difference between two lines.
 - D. Reject the null hypothesis, conclude there is no evidence of proportion of proportion of the first line being greater than the second.
 - E. Reject the null hypothesis, conclude there is insufficient evidence of proportion difference between two lines.

4. Assuming the calculated value of the test statistic is 1.76, what are the decision and conclusion of the test at the significance level of 0.10?
 - A. Fail to reject the null hypothesis, conclude there is sufficient evidence of proportion difference between two lines.
 - B. Reject the null hypothesis, conclude there is evidence of proportion difference between two lines.*
 - C. Fail to reject the null hypothesis, conclude there is insufficient evidence of proportion difference between two lines.
 - D. Reject the null hypothesis, conclude there is no evidence of proportion of proportion of the first line being greater than the second.
 - E. Reject the null hypothesis, conclude there is insufficient evidence of proportion difference between two lines.

5. Assuming the 90% confidence interval for $p_1 - p_2$ is $[-0.09 \text{ to } +0.03]$, what are the decision and conclusion of the test at the significance level of 0.10?

- A. Fail to reject the null hypothesis, conclude there is sufficient evidence of proportion difference between two lines.
- B. Reject the null hypothesis, conclude there is evidence of proportion difference between two lines.
- C. Fail to reject the null hypothesis, conclude there is insufficient evidence of proportion difference between two lines.*
- D. Reject the null hypothesis, conclude there is no evidence of proportion of proportion of the first line being greater than the second.
- E. Reject the null hypothesis, conclude there is insufficient evidence of proportion difference between two lines.

6. Suppose the value of the calculated test statistic is **3.86**. Which one of the following would best describe the p-value of the test?

- A. $p > .1$
- B. $.05 < p \leq .10$
- C. $.025 < p \leq .05$
- D. $.01 < p \leq .025$
- E. $p < 0.01^*$

Use the information given below to answer the next 3 questions.

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

	<i>before</i>	<i>after</i>
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	