

**COURSE: DSCI 3710**

**Print Name:**

**Final Exam: Version A**

**Signature:**

**SEMESTER: Fall 2009**

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

You have 105 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 mark all answers on the scantron.

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

When you have completed the exam, please insert your scantron into the exam booklet and turn them in to your instructor.

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 following information to answer the next six questions

@pizza express boasts of an average delivery time of less than 15 minutes on the orders placed from within a three mile distance from the facility. An investor doubts the claim and wants to see if the data refutes @pizza's claim and shows they take more than 15 minutes. The investor has independent observers obtain a random sample of orders and conduct the appropriate t-test using the KPK macro at 10% significance level. The results are given below:

Data	t Test for Population Mean	
13		
15	Number of Observations	14
14	Sample Standard Deviation	2.218801
17	Sample Mean	16.000000
19	Ho: xxxx	Ha: xxxx
13	T*	1.686342
15	P[T ≤ T*]	0.057783
14	T Critical, α = 0.1	XXXX
20	90% CI for Pop. Mean	14.949837 to 17.050163
.		
.		
.		
17		
15		

- What is the null and alternative hypothesis for this test?
  - Ho:  $\mu \leq 15$  Ha:  $\mu > 15$ \*
  - Ho:  $\mu \geq 15$  Ha:  $\mu < 15$
  - Ho:  $\mu \leq 16$  Ha:  $\mu \geq 16$
  - Ho:  $\mu = 15$  Ha:  $\mu \neq 15$
  - Ho:  $\mu \geq 16$  Ha:  $\mu < 16$
- The test is based on the assumption that:
  - The sample times are large
  - The sample mean is normally distributed
  - The true mean is 15.4 minutes
  - The sample is normally distributed
  - The delivery times are normally distributed\*

3. What is the best range to describe the p value (observed level of significance) of the test statistic?
- A.  $p > 0.10$
  - B.  $0.05 < p \leq .10^*$
  - C.  $0.025 < p \leq .05$
  - D.  $.01 < p \leq .025$
  - E.  $p \leq .01$
4. **Suppose** the calculated test statistic is 4.50. What would be the p-value?
- A.  $p > 0.10$
  - B.  $0.05 < p \leq .10$
  - C.  $0.025 < p \leq .05$
  - D.  $.01 < p \leq .025$
  - E.  $p \leq .01^*$
5. Where is the relevant “Reject  $H_0$  – region”?
- A. To the left of  $t = -1.35$
  - B. To the right of  $Z = 1.23$
  - C. To the left of  $Z = -1.23$
  - D. To the right of  $t = 0$
  - E. To the right of  $t = 1.35^*$
6. **Assuming** the calculated value of the test statistic is 1.00, what are the decision and conclusion of the test?
- A. Reject the null hypothesis, conclude @pizza’s claim may be justified
  - B. Fail to reject the null hypothesis, conclude @pizza’s claim may be justified \*
  - C. Fail to reject the null hypothesis, conclude @pizza’s claim is not justified
  - D. Reject the null hypothesis, conclude @pizza’s claim is not justified
  - E. Test for @pizza’s claim is inconclusive.

**Use the following information to answer the next five questions**

The manager of Hybrid Motors wishes to determine if the true mean productivity of employees at its Detroit plant is any different from that at its Mexico City plant (by measuring the number of cars that one employee is involved in the of assembly per day). Random samples of employees in Detroit and Mexico City are selected, and the productivity scores at each assembly plant are recorded. The following results are obtained using  $\alpha = 0.05$  and the Excel macro.