

First Exam

Write all answers in your blue book and show all work there. Return your exam and printout(s) in your blue book.

16 pts.

- 1) a) The V.P. routinely administers his surveys by sending a lengthy form to every student. Only 20 percent respond. What kind of bias are his results likely to suffer.? Explain.  
b) The prof. has his classes complete a questionnaire. What kind of sample is this (if the target population is all students)? Is this approach likely to give a unbiased sample? Why?

28 pts.

- 2) A population has only three values in it, the number of snow days in each of three years. They are {0, 2, 4}.  
a) Find  $\mu$  and  $\sigma$ .  
b) If  $n = 2$  and sampling is without replacement, show the sampling distribution for  $\bar{X}$ .  
c) Find the expected value of  $\bar{X}$ . Is  $\bar{X}$  unbiased? Why?  
d) Find  $s_{\bar{x}}$ . Compare it to  $\sigma$  and explain the difference.

16 pts.

- 3) If 5 percent of the units off the production line are defective, what is the probability that a sample of 49 will be 10 percent defective?

20 pts

4) COMPUTER PROBLEM

- a) Open "auto" in the chapter 8 Excel files with either SPSS or Excel  
b) Find a 90 percent confidence interval for the population mean of miles.  
c) Print your results (with your name) and be sure that the confidence interval is clearly identified on the printout.

20 pts

5) a) President W. will launch an attack unless he finds convincing evidence ( $\alpha = .05$ ) that less than 50 percent of the country support him. If 45 percent of a sample of 1000 people support him, what will he do?

(Show all steps to the test.)

b) Find the power of the test when the real  $p$  equals .474

I have neither given nor received unfair aid on this test nor am I aware of anyone else who has.

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