

First Exam

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

12 pts.

- 1) a) Prof X says that his sample is stratified. What does this mean?
- b) Write an equation that shows how the mean is calculated when you have a stratified random sample.
- c) What is the advantage of such sample?

20 pts.

- 2) Suppose that we have a trivially small population of (2,4,12) .
  - a) Find  $\mu$  and  $\sigma$ .
  - b) Are the data skewed? Why? Find SK.
  - c) Show the sampling distribution when we take a sample of 2 without replacement.
  - d) Find the EV of the mean and say if it appears to be unbiased.
  - e) Use the sampling distribution to find the standard error of the mean and use this to confirm that our standard formula for this seems to work.

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14 pts.

- 3) Mrs Y wants to estimate average income in her state and she wants to be 95% sure that her estimate is correct. She has a sample of 100 with a mean of 50000 and a standard deviation of 15. Use this information to give a point estimate. Are we 95% sure about this? Why? If not, give an estimate that we can be 95% sure about.

14 pts

- 4) **Computer Problem.** Use the NYSEStocks file in the Chapter 8 folder of the 2216 files to construct a 99% confidence interval for mean P/E Ratio. Use either Excel or SPSS and print your results with your name typed into it..

20 pts.

- 5) a) If  $\bar{x} = 500$  is this convincing evidence that  $\mu < 600$  if  $s = 300$  and  $n = 25$  and  $\alpha = .01$ . Show all steps to the test.
- b) What do you need to assume about the population for your part a procedures to be valid?
- b) If the real mean is 500, what is  $\beta$  for this test?

OVER

20 pts

6 Mr. Z thinks that 30% of voters want him to run for office. A sample of 300 has 100 that feel this way. Based on this, would you say he's right if  $\alpha$  is .05. Show all steps to the test.

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