

Statistics Exam 3 Review

Name \_\_\_\_\_

Date \_\_\_\_\_!

SHORT ANSWER.

Provide an appropriate response.

1) A random sample of 120 students has a test score average with a standard deviation of 11.4. Find the margin of error if  $c = 0.90$ . 1) \_\_\_\_\_

2) A random sample of 40 students has a test score with  $\bar{x} = 81.5$  and  $s = 10.2$ . Construct the confidence interval for the population mean,  $\mu$  if  $c = 0.90$ . 2) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

3) In order to set rates, an insurance company is trying to estimate the number of sick days that full time workers at an auto repair shop take per year. A previous study indicated that the standard deviation was 2.8 days. How large a sample must be selected if the company wants to be 95% confident that the true mean differs from the sample mean by no more than 1 day?  
A) 1024                      B) 141                      C) 512                      D) 31 3) \_\_\_\_\_

4) Find the value of E, the margin of error, for  $c = 0.99$ ,  $n = 15$  and  $s = 5.7$ .  
A) 3.86                      B) 4.49                      C) 4.38                      D) 1.13 4) \_\_\_\_\_

SHORT ANSWER.

5) Construct a 90% confidence interval for the population mean,  $\mu$ . Assume the population has a normal distribution. A sample of 15 randomly selected students has a grade point average of 2.86 with a standard deviation of 0.78. 5) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 6) In a survey of 2480 golfers, 15% said they were left-handed. The survey's margin of error was 3%. Construct a confidence interval for the proportion of left-handed golfers. 6) \_\_\_\_\_
- A) (0.12, 0.15)      B) (0.12, 0.18)      C) (0.11, 0.19)      D) (0.18, 0.21)

SHORT ANSWER.

- 7) A researcher at a major hospital wishes to estimate the proportion of the adult population of the United States that has high blood pressure. How large a sample is needed in order to be 99% confident that the sample proportion will not differ from the true proportion by more than 4%? 7) \_\_\_\_\_

- 8) A local brewery distributes beer in bottles labeled 32 ounces. A government agency thinks that the brewery is cheating its customers. The agency selects 50 of these bottles, measures their contents, and obtains a sample mean of 31.6 ounces with a standard deviation of 0.70 ounce. Use a 0.01 significance level to test the agency's claim that the brewery is cheating its customers. 8) \_\_\_\_\_

- 9) A local brewery distributes beer in bottles labeled 12 ounces. A government agency thinks that the brewery is cheating its customers. The agency selects 20 of these bottles, measures their contents, and obtains a sample mean of 11.7 ounces with a standard deviation of 0.7 ounce. Use a 0.01 significance level to test the agency's claim that the brewery is cheating its customers. 9) \_\_\_\_\_

10) The engineering school at a major university claims that 20% of its graduates are women. In a graduating class of 210 students, 58 were women. Does this suggest that the school is believable? Use  $\alpha = 0.05$ . 10) \_\_\_\_\_

11) In one area, monthly incomes of college graduates have a standard deviation of \$650. It is believed that the standard deviation of monthly incomes of non-college graduates is higher. A sample of 71 non-college graduates are randomly selected and found to have a standard deviation of \$950. Test the claim that non-college graduates have a higher standard deviation. Use  $\alpha = 0.05$ . 11) \_\_\_\_\_

12) A local bank claims that the waiting time for its customers to be served is the lowest in the area. A competitor's bank checks the waiting times at both banks. The sample statistics are listed below. Test the local bank's claim: assuming that  $\sigma_1^2 \neq \sigma_2^2$ . Use  $\alpha = 0.05$ . 12) \_\_\_\_\_

Local Bank	Competitor Bank
$n_1 = 15$	$n_2 = 16$
$\bar{x}_1 = 5.3$ minutes	$\bar{x}_2 = 5.6$ minutes
$s_1 = 1.1$ minutes	$s_2 = 1.0$ minutes

13) A local bank claims that the variance of waiting time for its customers to be served is the lowest in the area. A competitor bank checks the waiting time at both banks. The sample statistics are listed below. Test the local bank's claim. Use  $\alpha = 0.05$ . 13) \_\_\_\_\_

Local Bank	Competitor Bank
$n_1 = 13$	$n_2 = 16$
$s_1 = 0.66$ minutes	$s_2 = 0.78$ minutes

14) A medical researcher wishes to try three different techniques to lower blood pressure of patients with high blood pressure. The subjects are randomly selected and assigned to one of three groups. Group 1 is given medication, Group 2 is given an exercise program, and Group 3 is assigned a diet program. At the end of six weeks, each subject's blood pressure is recorded. Test the claim that there is no difference among the means. Use  $\alpha = 0.05$ .

14) \_\_\_\_\_

Group 1	Group 2	Group 3
9	8	4
12	2	12
13	5	4
15	3	8
11	4	9
8	0	6