CHAPTER 7 FORM A

Name_____ Course Number:_____ Section Number:_____

Directions: Answer Question #20 in the space provided. Circle the correct choice for each response set. If required, show calculations in the blank spaces near the problems, or attach paper.

Express the confidence interval using the indicated format.

1) Express the confidence interval $-0.001 < p < 0.559$ in the form of $\hat{p} \pm E$.

A) 0.279 – 0.28 B) 0.279 ± 0.5 C) 0.279 ± 0.28 D) 0.28 ± 0.5

Solve the problem.

2) The following confidence interval is obtained for a population proportion, p: $0.883 < p < 0.911$. Use these confidence interval limits to find the margin of error, E.

A) 0.014 B) 0.015 C) 0.897 D) 0.028

Assume that a sample is used to estimate a population proportion p. Find the margin of error E that corresponds to the given statistics and confidence level. Round the margin of error to four decimal places.

3) 90% confidence; n = 300, x = 50

A) 0.0354 B) 0.0443 C) 0.0422 D) 0.0380

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

4) n = 130, x = 65; 90% confidence

A) $0.426 < p < 0.574$ B) $0.428 < p < 0.572$

C) $0.432 < p < 0.568$ D) $0.430 < p < 0.570$

Use the given data to find the minimum sample size required to estimate the population proportion.

5) Margin of error: 0.003; confidence level: 94%; $\hat{p}$ and $\hat{q}$ unknown

A) 88,177 B) 98,301 C) 98,178 D) 98,171

6) Margin of error: 0.04; confidence level: 99%; from a prior study, $\hat{p}$ is estimated by 0.13.

A) 272 B) 469 C) 563 D) 19

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

7) Of 375 randomly selected medical students, 30 said that they planned to work in a rural community. Find a 95% confidence interval for the true proportion of all medical students who plan to work in a rural community.

A) $0.0439 < p < 0.116$ B) $0.0570 < p < 0.103$

C) $0.0525 < p < 0.107$ D) $0.0474 < p < 0.113$

Find the indicated critical z value.

8) Find the critical value $z_{\alpha/2}$ that corresponds to a 98% confidence level.

A) 1.75 B) 2.575 C) 2.33 D) 2.05

Determine whether the given conditions justify using the margin of error $E = z_{\alpha/2}\,\sigma/\sqrt{n}$ when finding a confidence interval estimate of the population mean μ.

9) The sample size is $n = 11$, σ is not known, and the original population is normally distributed.

A) No B) Yes

Use the confidence level and sample data to find the margin of error E. Round your answer to the same number of decimal places as the sample mean unless otherwise noted.

10) Replacement times for washing machines: 90% confidence; $n = 45$, $\bar{x} = 11.5$ years, $\sigma = 2.4$ years

A) 0.1 yr B) 0.5 yr C) 0.6 yr D) 2.8 yr

Use the confidence level and sample data to find a confidence interval for estimating the population μ. Round your answer to the same number of decimal places as the sample mean.

11) Test scores: $n = 105$, $\bar{x} = 70.5$, $\sigma = 6.8$; 99% confidence

A) $69.0 < \mu < 72.0$ B) $68.8 < \mu < 72.2$

C) $69.2 < \mu < 71.8$ D) $69.4 < \mu < 71.6$

Use the given information to find the minimum sample size required to estimate an unknown population mean μ.

12) How many business students must be randomly selected to estimate the mean monthly earnings of business students at one college? We want 95% confidence that the sample mean is within \$129 of the population mean, and the population standard deviation is known to be \$595.

A) 58 B) 72 C) 82 D) 115

Do one of the following, as appropriate: (a) Find the critical value $z_{\alpha/2}$, (b) find the critical value $t_{\alpha/2}$, (c) state that neither the normal nor the t distribution applies.

13) 90%; $n = 10$; σ is unknown; population appears to be normally distributed.

A) $t_{\alpha/2} = 1.812$ B) $z_{\alpha/2} = 2.262$ C) $z_{\alpha/2} = 1.383$ D) $t_{\alpha/2} = 1.833$

Assume that a sample is used to estimate a population mean μ. Use the given confidence level and sample data to find the margin of error. Assume that the sample is a simple random sample and the population has a normal distribution. Round your answer to one more decimal place than the sample standard deviation.

14) 95% confidence; $n = 21$; $\bar{x} = 0.53$; $s = 0.53$

A) 0.217 B) 0.207 C) 0.241 D) 0.253

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ. Assume that the population has a normal distribution.

15) A savings and loan association needs information concerning the checking account balances of its local customers. A random sample of 14 accounts was checked and yielded a mean balance of $664.14 and a standard deviation of $297.29. Find a 98% confidence interval for the true mean checking account balance for local customers.

A) $455.65 < μ < $872.63
B) $492.52 < μ < $835.76
C) $493.71 < μ < $834.57
D) $453.59 < μ < $874.69

Solve the problem.

16) Find the critical value χ^2_R corresponding to a sample size of 25 and a confidence level of 99 percent.

A) 45.559
B) 10.856
C) 42.980
D) 9.886

Use the given degree of confidence and sample data to find a confidence interval for the population standard deviation σ. Assume that the population has a normal distribution. Round the confidence interval limits to the same number of decimal places as the sample standard deviation.

17) To find the standard deviation of the diameter of wooden dowels, the manufacturer measures 19 randomly selected dowels and finds the standard deviation of the sample to be s = 0.16. Find the 95% confidence interval for the population standard deviation σ.

A) 0.13 < σ < 0.22
B) 0.11 < σ < 0.25
C) 0.12 < σ < 0.24
D) 0.15 < σ < 0.21

Find the appropriate minimum sample size.

18) You want to be 95% confident that the sample variance is within 30% of the population variance.

A) 346
B) 723
C) 130
D) 98

Use the given degree of confidence and sample data to find a confidence interval for the population standard deviation σ. Assume that the population has a normal distribution. Round the confidence interval limits to one more decimal place than is used for the original set of data.

19) The amounts (in ounces) of juice in eight randomly selected juice bottles are:
15.8 15.2 15.8 15.5
15.4 15.2 15.9 15.6
Find a 98% confidence interval for the population standard deviation σ.

A) 0.16 oz < σ < 0.56 oz
B) 0.17 oz < σ < 0.56 oz
C) 0.20 oz < σ < 0.76 oz
D) 0.17 oz < σ < 0.65 oz

Provide an appropriate response.

20) A paper published the results of a poll. It stated that, based on a sample of 1000 married men, 51% of married men say that they would marry the same woman again. The margin of error was given as ±3 percentage points and the confidence level was given as 95%. What does it mean that the margin of error was ±3 percentage points?

1) C
2) A
3) A
4) B
5) C
6) B
7) C
8) C
9) A
10) C
11) B
12) C
13) D
14) C
15) D
16) A
17) C
18) D
19) D
20) If 51% is used as an estimate of the percentage of all married men who would marry the same woman again, we would be 95% confident that the maximum likely difference between 51% and the true population percentage is 3 percentage points. So the true percentage is likely (with 95% confidence) to lie between 48% and 54%.