

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

**Find the indicated critical z value.**

- 1) Find the value of  $-z_{\alpha/2}$  that corresponds to a confidence level of 96.68%. 1) \_\_\_\_\_  
A) -1.84 B) 2.13 C) -2.13 D) 0.0166
- 2) Find the critical value  $z_{\alpha/2}$  that corresponds to a 98% confidence level. 2) \_\_\_\_\_  
A) 1.75 B) 2.575 C) 2.05 D) 2.33
- 3) Find the value of  $-z_{\alpha/2}$  that corresponds to a confidence level of 96.68%. 3) \_\_\_\_\_  
A) -1.84 B) 0.0166 C) -2.13 D) 2.13
- 4) Find the critical value  $z_{\alpha/2}$  that corresponds to a 98% confidence level. 4) \_\_\_\_\_  
A) 1.75 B) 2.05 C) 2.33 D) 2.575
- 5) Find the critical value  $z_{\alpha/2}$  that corresponds to a 91% confidence level. 5) \_\_\_\_\_  
A) 1.75 B) 1.70 C) 1.34 D) 1.645
- 6) Find  $z_{\alpha/2}$  for  $\alpha = 0.09$ . 6) \_\_\_\_\_  
A) 1.34 B) 1.75 C) 2.61 D) 1.70

**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.**

- 7) College students' annual earnings: 99% confidence;  $n = 68$ ,  $\bar{x} = \$3068$ ,  $\sigma = \$818$  7) \_\_\_\_\_  
A) \$255 B) \$194 C) \$958 D) \$231
- 8) Weights of eggs: 95% confidence;  $n = 45$ ,  $\bar{x} = 1.50$  oz,  $\sigma = 0.20$  oz 8) \_\_\_\_\_  
A) 0.01 oz B) 0.44 oz C) 0.06 oz D) 0.05 oz

**Solve the problem. Round the point estimate to the nearest thousandth.**

- 9) 386 randomly selected light bulbs were tested in a laboratory, 97 lasted more than 500 hours. Find a point estimate of the proportion of all light bulbs that last more than 500 hours. 9) \_\_\_\_\_  
A) 0.749 B) 0.251 C) 0.249 D) 0.201
- 10) Find the point estimate of the proportion of people who wear hearing aids if, in a random sample of 381 people, 76 people had hearing aids. 10) \_\_\_\_\_  
A) 0.166 B) 0.199 C) 0.197 D) 0.801

**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.**

- 11) 95% confidence; the sample size is 5700, of which 20% are successes 11) \_\_\_\_\_  
A) 0.00780 B) 0.0104 C) 0.0120 D) 0.0137
- 12) 95% confidence;  $n = 250$ ,  $x = 130$  12) \_\_\_\_\_  
A) 0.0557 B) 0.0743 C) 0.0619 D) 0.0650

- 13) In a random sample of 158 college students, 104 had part-time jobs. Find the margin of error for the 95% confidence interval used to estimate the population proportion. 13) \_\_\_\_\_
- A) 0.0666                      B) 0.00279                      C) 0.130                      D) 0.0740

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

- 14) Margin of error: 0.027; confidence level: 98%;  $\hat{p}$  and  $\hat{q}$  unknown 14) \_\_\_\_\_
- A) 1686                      B) 1970                      C) 863                      D) 1862

- 15) Margin of error: 0.02; confidence level: 95%; from a prior study,  $\hat{p}$  is estimated by the decimal equivalent of 52%. 15) \_\_\_\_\_
- A) 2398                      B) 4994                      C) 4139                      D) 2158

- 16) Margin of error: 0.008; confidence level: 99%;  $\hat{p}$  and  $\hat{q}$  unknown 16) \_\_\_\_\_
- A) 15,900                      B) 26,024                      C) 25,894                      D) 25,901

- 17) Margin of error: 0.04; confidence level: 95%; from a prior study,  $\hat{p}$  is estimated by the decimal equivalent of 89%. 17) \_\_\_\_\_
- A) 9                      B) 209                      C) 236                      D) 708

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

- 18) A survey of 865 voters in one state reveals that 408 favor approval of an issue before the legislature. Construct the 95% confidence interval for the true proportion of all voters in the state who favor approval. 18) \_\_\_\_\_
- A)  $0.438 < p < 0.505$                       B)  $0.435 < p < 0.508$   
 C)  $0.471 < p < 0.472$                       D)  $0.444 < p < 0.500$

**Use the given degree of confidence and sample data to construct a confidence interval for the population mean  $\mu$ .**

**Assume that the population has a normal distribution.**

- 19) 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. 19) \_\_\_\_\_
- A)  $\$455.65 < \mu < \$872.63$                       B)  $\$492.52 < \mu < \$835.76$   
 C)  $\$493.71 < \mu < \$834.57$                       D)  $\$453.59 < \mu < \$874.69$

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

- 20)  $n = 117, x = 67$ ; 88% confidence 20) \_\_\_\_\_
- A)  $0.497 < p < 0.649$                       B)  $0.502 < p < 0.644$   
 C)  $0.498 < p < 0.648$                       D)  $0.501 < p < 0.645$
- 21) Of 286 employees selected randomly from one company, 12.59% of them commute by carpooling. Construct a 90% confidence interval for the true percentage of all employees of the company who carpool. 21) \_\_\_\_\_
- A)  $9.36\% < p < 15.8\%$                       B)  $7.53\% < p < 17.6\%$   
 C)  $8.02\% < p < 17.2\%$                       D)  $8.74\% < p < 16.4\%$



- 31) Margin of error: \$140, confidence level: 95%,  $\sigma = \$589$  31) \_\_\_\_\_  
 A) 60 B) 96 C) 68 D) 48

**Assume that a sample is used to estimate a population mean  $\mu$ . 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.**

- 32) 95% confidence;  $n = 91$ ;  $\bar{x} = 24$ ,  $s = 14.7$  32) \_\_\_\_\_  
 A) 5.26 B) 2.75 C) 3.06 D) 2.62
- 33) 95% confidence;  $n = 51$ ;  $\bar{x} = 240$ ;  $s = 242$  33) \_\_\_\_\_  
 A) 88.5 B) 143.0 C) 61.3 D) 68.1

**Solve the problem.**

- 34) A newspaper article about the results of a poll states: "In theory, the results of such a poll, in 99 cases out of 100 should differ by no more than 2 percentage points in either direction from what would have been obtained by interviewing all voters in the United States." Find the sample size suggested by this statement. 34) \_\_\_\_\_  
 A) 2402 B) 4145 C) 3394 D) 165
- 35) The following confidence interval is obtained for a population proportion,  $p$ : (0.862, 0.894). Use these confidence interval limits to find the point estimate,  $\hat{p}$ . 35) \_\_\_\_\_  
 A) 0.885 B) 0.862 C) 0.894 D) 0.878

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

- 36) 48 packages are randomly selected from packages received by a parcel service. The sample has a mean weight of 10.1 pounds and a standard deviation of 2.9 pounds. What is the 95% confidence interval for the true mean weight,  $\mu$ , of all packages received by the parcel service? 36) \_\_\_\_\_  
 A)  $9.0 \text{ lb} < \mu < 11.2 \text{ lb}$  B)  $9.3 \text{ lb} < \mu < 10.9 \text{ lb}$   
 C)  $9.1 \text{ lb} < \mu < 11.1 \text{ lb}$  D)  $9.4 \text{ lb} < \mu < 10.8 \text{ lb}$
- 37) A random sample of 112 full-grown lobsters had a mean weight of 22 ounces and a standard deviation of 3.8 ounces. Construct a 98% confidence interval for the population mean  $\mu$ . 37) \_\_\_\_\_  
 A)  $21 \text{ oz} < \mu < 23 \text{ oz}$  B)  $21 \text{ oz} < \mu < 24 \text{ oz}$   
 C)  $20 \text{ oz} < \mu < 22 \text{ oz}$  D)  $22 \text{ oz} < \mu < 24 \text{ oz}$
- 38) Test scores:  $n = 99$ ,  $\bar{x} = 88.6$ ,  $\sigma = 7.7$ ; 99% confidence 38) \_\_\_\_\_  
 A)  $86.6 < \mu < 90.6$  B)  $87.1 < \mu < 90.1$  C)  $87.3 < \mu < 89.9$  D)  $86.8 < \mu < 90.4$

**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.**

- 39) 99%;  $n = 17$ ;  $\sigma$  is unknown; population appears to be normally distributed. 39) \_\_\_\_\_  
 A)  $t_{\alpha/2} = 2.898$  B)  $z_{\alpha/2} = 2.583$  C)  $t_{\alpha/2} = 2.921$  D)  $z_{\alpha/2} = 2.567$
- 40) 98%;  $n = 7$ ;  $\sigma = 27$ ; population appears to be normally distributed. 40) \_\_\_\_\_  
 A)  $t_{\alpha/2} = 1.96$  B)  $t_{\alpha/2} = 2.575$  C)  $z_{\alpha/2} = 2.33$  D)  $z_{\alpha/2} = 2.05$

41) 90%;  $n = 9$ ;  $\sigma = 4.2$ ; population appears to be very skewed.

A)  $z_{\alpha/2} = 2.365$

B) Neither the normal nor the t distribution applies.

C)  $z_{\alpha/2} = 2.306$

D)  $z_{\alpha/2} = 2.896$

41) \_\_\_\_\_

## Answer Key

Testname: PRACTICE QUIZ 3

- 1) C
- 2) D
- 3) C
- 4) C
- 5) B
- 6) D
- 7) A
- 8) C
- 9) B
- 10) B
- 11) B
- 12) C
- 13) D
- 14) D
- 15) A
- 16) D
- 17) C
- 18) A
- 19) D
- 20) B
- 21) A
- 22) D
- 23) C
- 24) D
- 25) C
- 26) A
- 27) A
- 28) A
- 29) C
- 30) C
- 31) C
- 32) C
- 33) D
- 34) B
- 35) D
- 36) B
- 37) A
- 38) A
- 39) C
- 40) C
- 41) B