

You need Scantron 882E. Be sure you use a pencil and your Scantron is clean, flat and not folded when you submit.  
**Do All the problems but only submit the first 50 problems.**

**Provide an appropriate response.**

- 1) A point estimate is the value of a \_\_\_\_\_ that estimates the value of a \_\_\_\_\_. 1) \_\_\_\_\_  
A) random variable; parameter                      B) random variable; statistic  
C) parameter; statistic                                D) statistic; parameter
  
- 2) Determine the point estimate of the population mean for the confidence interval with a lower bound of 25 and an upper bound of 35. 2) \_\_\_\_\_  
A) 35    B) 30    C) 25    D) 31
  
- 3) Compute the critical value  $z_{\alpha/2}$  that corresponds to a 94% level of confidence. 3) \_\_\_\_\_  
A) 1.96    B) 2.33    C) 1.88    D) 1.645
  
- 4) In a sample of 10 randomly selected employees, it was found that their mean height was 63.4 inches. From previous studies, it is assumed that the standard deviation,  $\sigma$ , is 2.4. Compute the 95% confidence interval for  $\mu$ . 4) \_\_\_\_\_  
A) (60.8, 65.4)                                        B) (58.1, 67.3)                                        C) (59.7, 66.5)                                        D) (61.9, 64.9)
  
- 5) A random sample of 150 towns in a western state had an average annual precipitation of 2.86 inches and a population standard deviation of 0.78 inches. Compute the 98% confidence interval for  $\mu$ . 5) \_\_\_\_\_  
A) (2.51, 3.53)                                        B) (2.43, 3.79)                                        C) (2.71, 3.01)                                        D) (2.31, 3.88)
  
- 6) A random sample of 56 lithium batteries has a mean life of 645 hours with a population standard deviation of 31 hours. Compute the 95% confidence interval for  $\mu$ . 6) \_\_\_\_\_  
A) (539.6, 551.2)                                    B) (712.0, 768.0)                                    C) (112.0, 118.9)                                    D) (636.9, 653.1)
  
- 7) A confidence interval for a parameter is 7) \_\_\_\_\_  
A) An interval of probabilities concerning a parameter.  
B) A statement of believability of a statistical result.  
C) A point estimate plus a margin of error.  
D) An interval of numbers combined with the likelihood the interval contains the unknown parameter.
  
- 8) True or False: A confidence interval with a 95% level of confidence means that the parameter will be in the interval for 95 out of 100 samples of the same size. 8) \_\_\_\_\_  
A) False    B) True
  
- 9) The critical value of a distribution is the value of 9) \_\_\_\_\_  
A) the area of the tail region of the distribution  
B)  $z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$   
C) the parameter  
D)  $z_{\alpha/2}$

- 10) The margin of error of a confidence interval is 10) \_\_\_\_\_  
 A)  $\bar{x}$                       B)  $\frac{\sigma}{\sqrt{n}}$                       C)  $\pm z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$                       D)  $z_{\alpha/2}$
- 11) A 90% confidence interval for the mean percentage of airline reservations being canceled on the day of the flight is (1.7%, 5%). What is the point estimator of the mean percentage of reservations that are canceled on the day of the flight? 11) \_\_\_\_\_  
 A) 1.65%                      B) 3.35%                      C) 2.50%                      D) 3.3%
- 12) Suppose a 95% confidence interval for  $\mu$  turns out to be (100, 230). To make more useful inferences from the data, it is desired to reduce the width of the confidence interval. Which of the following will result in a reduced interval width? 12) \_\_\_\_\_  
 A) All of these.  
 B) Decrease the confidence level.  
 C) Increase the sample size and decrease the confidence level.  
 D) Increase the sample size.
- 13) Suppose a 90% confidence interval for  $\mu$  turns out to be (150, 250). Based on the interval, do you believe the average is equal to 260? 13) \_\_\_\_\_  
 A) Yes, and I am 90% sure of it.                      B) Yes, and I am 100% sure of it.  
 C) No, and I am 100% sure of it.                      D) No, and I am 90% sure of it.
- 14) The cell phone conversations of a random sample of 120 students has a standard deviation of 9.7 minutes. Find the margin of error, E, using a 98% confidence interval. 14) \_\_\_\_\_  
 A) 0.89                      B) 0.87                      C) 0.19                      D) 2.06
- 15) True or False: As the level of confidence increases the margin of error decreases. 15) \_\_\_\_\_  
 A) False                      B) True
- 16) Which of the following is not a characteristic of Students' t distribution? 16) \_\_\_\_\_  
 A) For large samples, the t and z distributions are nearly equivalent.  
 B) symmetric distribution  
 C) mean of 1  
 D) depends on degrees of freedom.
- 17) Suppose a 98% confidence interval for  $\mu$  turns out to be (1000, 2100). If this interval was based on a sample of size  $n = 25$ , explain what assumptions are necessary for this interval to be valid. 17) \_\_\_\_\_  
 A) The sampling distribution of the sample mean must have a normal distribution.  
 B) The population must have an approximately normal distribution.  
 C) The sampling distribution must be biased with 24 degrees of freedom.  
 D) The population of salaries must have an approximate t distribution.
- 18) To select the correct Student's t-distribution requires knowing the degrees of freedom. How many degrees of freedom are there for a sample of size n? 18) \_\_\_\_\_  
 A)  $n + 1$                       B)  $n$                       C)  $n - 1$                       D)  $\frac{\bar{x} - \mu}{s/\sqrt{n}}$

- 19) Let  $t_0$  be a specific value of  $t$ . Find  $t_0$  such that the following statement is true: 19) \_\_\_\_\_  
 $P(t \geq t_0) = 0.05$  where  $df = 20$   
 A) -1.725                      B) -1.729                      C) 1.729                      D) 1.725
- 20) Find the critical  $t$ -value that corresponds to 99% confidence and  $n = 10$ . 20) \_\_\_\_\_  
 A) 2.821                      B) 3.250                      C) 1.833                      D) 2.262
- 21) Construct a 95% confidence interval for the population mean,  $\mu$ . Assume the population has a normal distribution. A sample of 20 part-time workers had mean annual earnings of \$3120 with a standard deviation of \$677. 21) \_\_\_\_\_  
 A) (\$2803, \$3437)                      B) (\$2657, \$2891)                      C) (\$1324, \$1567)                      D) (\$2135, \$2567)
- 22) Construct a 90% confidence interval for the population mean,  $\mu$ . Assume the population has a normal distribution. A sample of 15 randomly selected math majors has a grade point average of 2.86 with a standard deviation of 0.78. 22) \_\_\_\_\_  
 A) (2.51, 3.21)                      B) (2.28, 3.66)                      C) (2.37, 3.56)                      D) (2.41, 3.42)
- 23) Construct a 95% confidence interval for the population mean,  $\mu$ . Assume the population has a normal distribution. A random sample of 16 lithium batteries has a mean life of 645 hours with a standard deviation of 31 hours. 23) \_\_\_\_\_  
 A) (531.2, 612.9)                      B) (321.7, 365.8)                      C) (628.5, 661.5)                      D) (876.2, 981.5)
- 24) A random sample of 10 parking meters in a resort community showed the following incomes for a c 24) \_\_\_\_\_  
 Assume the incomes are normally distributed. Find the 95% confidence interval for the true mean.  
 \$3.60 \$4.50 \$2.80 \$6.30 \$2.60 \$5.20 \$6.75 \$4.25 \$8.00 \$3.00  
 A) (\$1.35, \$2.85)                      B) (\$4.81, \$6.31)                      C) (\$3.39, \$6.01)                      D) (\$2.11, \$5.34)
- 25) The grade point averages for 10 randomly selected junior college students are listed below. 25) \_\_\_\_\_  
 Assume the grade point averages are normally distributed. Find a 98% confidence interval for the true mean.  
 2.0 3.2 1.8 2.9 0.9 4.0 3.3 2.9 3.6 0.8  
 A) (0.67, 1.81)                      B) (2.12, 3.14)                      C) (1.55, 3.53)                      D) (3.11, 4.35)
- 26) When 465 junior college students were surveyed, 135 said that they have previously owned a 26) \_\_\_\_\_  
 motorcycle. Find a point estimate for  $p$ , the population proportion of students who have previously owned a motorcycle.  
 A) 0.710                      B) 0.409                      C) 0.290                      D) 0.225
- 27) A survey of 100 fatal accidents showed that in 41 cases the driver at fault was inadequately 27) \_\_\_\_\_  
 insured. Find a point estimate for  $p$ , the population proportion of accidents where the driver at fault was inadequately insured  
 A) 0.695                      B) 0.291                      C) 0.59                      D) 0.41
- 28) A survey of 700 non-fatal accidents showed that 248 involved faulty equipment. Find a point 28) \_\_\_\_\_  
 estimate for  $p$ , the population proportion of accidents that involved faulty equipment.  
 A) 0.549                      B) 0.262                      C) 0.354                      D) 0.646

- 29) An article a Florida newspaper reported on the topics that teenagers most want to discuss with their parents. The findings, the results of a poll, showed that 46% would like more discussion about the family's financial situation, 37% would like to talk about school, and 30% would like to talk about religion. These and other percentages were based on a national sampling of 531 teenagers. Estimate the proportion of all teenagers who want more family discussions about school. Use a 99% confidence level. 29) \_\_\_\_\_  
 A)  $0.37 \pm 0.002$                       B)  $0.63 \pm 0.054$                       C)  $0.37 \pm 0.054$                       D)  $0.63 \pm 0.002$
- 30) Many people think that a national lobby's successful fight against gun control legislation is reflecting the will of a minority of Americans. A random sample of 4000 citizens yielded 2250 who are in favor of gun control legislation. Estimate the true proportion of all Americans who are in favor of gun control legislation using a 90% confidence interval. 30) \_\_\_\_\_  
 A)  $0.4375 \pm 0.0129$                       B)  $0.4375 \pm 0.4048$                       C)  $0.5625 \pm 0.4048$                       D)  $0.5625 \pm 0.0129$
- 31) A university dean is interested in determining the proportion of students who receive some sort of financial aid. Rather than examine the records for all students, the dean randomly selects 200 students and finds that 118 of them are receiving financial aid. Use a 95% confidence interval to estimate the true proportion of students on financial aid. 31) \_\_\_\_\_  
 A)  $0.59 \pm 0.068$                       B)  $0.59 \pm 0.005$                       C)  $0.59 \pm 0.474$                       D)  $0.59 \pm 0.002$
- 32) A survey of 280 homeless persons showed that 63 were veterans. Construct a 90% confidence interval for the proportion of homeless persons who are veterans. 32) \_\_\_\_\_  
 A) (0.161, 0.289)                      B) (0.176, 0.274)                      C) (0.167, 0.283)                      D) (0.184, 0.266)
- 33) A survey of 2450 golfers showed that 281 of them are left-handed. Construct a 98% confidence interval for the proportion of golfers that are left-handed. 33) \_\_\_\_\_  
 A) (0.369, 0.451)                      B) (0.203, 0.293)                      C) (0.100, 0.130)                      D) (0.683, 0.712)
- 34) In a random sample of 60 dog owners enrolled in obedience training, it was determined that the mean amount of money spent per owner was \$109.33 per class. Assuming the population standard deviation of the amount spent per owner is \$12, construct and interpret a 95% confidence interval for the mean amount spent per owner for an obedience class. 34) \_\_\_\_\_  
 A) (\$106.23, \$112.43); we are 95% confident that the mean amount spent per dog owner for a single obedience class is between \$106.23 and \$112.43.  
 B) (\$106.29, \$112.37); we are 95% confident that the mean amount spent per dog owner for a single obedience class is between \$106.29 and \$112.37.  
 C) (\$106.78, \$111.88); we are 95% confident that the mean amount spent per dog owner for a single obedience class is between \$106.78 and \$111.88.  
 D) (\$106.74, \$111.92); we are 95% confident that the mean amount spent per dog owner for a single obedience class is between \$106.74 and \$111.92.

- 35) A survey of 1010 college seniors working towards an undergraduate degree was conducted. Each student was asked, "Are you planning or not planning to pursue a graduate degree?" Of the 1010 surveyed, 658 stated that they were planning to pursue a graduate degree. Construct and interpret a 98% confidence interval for the proportion of college seniors who are planning to pursue a graduate degree. 35) \_\_\_\_\_
- A) (0.612, 0.690); we are 98% confident that the proportion of college seniors who are planning to pursue a graduate degree is between 0.612 and 0.690.  
 B) (0.616, 0.686); we are 98% confident that the proportion of college seniors who are planning to pursue a graduate degree is between 0.616 and 0.686.  
 C) (0.620, 0.682); we are 98% confident that the proportion of college seniors who are planning to pursue a graduate degree is between 0.620 and 0.682.  
 D) (0.621, 0.680); we are 98% confident that the proportion of college seniors who are planning to pursue a graduate degree is between 0.621 and 0.680.
- 36) Construct a 95% confidence interval for  $\mu_1 - \mu_2$ . Two samples are randomly selected from each population. The sample statistics are given below. 36) \_\_\_\_\_
- |                  |                  |
|------------------|------------------|
| $n_1 = 40$       | $n_2 = 35$       |
| $\bar{x}_1 = 12$ | $\bar{x}_2 = 13$ |
| $s_1 = 2.5$      | $s_2 = 2.8$      |
- A) (-2.209, 0.209)      B) (-1.673, 1.892)      C) (-1.968, 1.561)      D) (-2.001, -1.873)
- 37) Construct a 95% confidence interval for  $p_1 - p_2$ . The sample statistics listed below are from independent samples. 37) \_\_\_\_\_
- Sample statistics:  $n_1 = 50$ ,  $x_1 = 35$ , and  $n_2 = 60$ ,  $x_2 = 40$
- A) (-0.871, 0.872)      B) (-0.141, 0.208)      C) (-2.391, 3.112)      D) (-1.341, 1.781)
- 38) In a recent survey of drinking laws, a random sample of 1000 women showed that 65% were in favor of increasing the legal drinking age. In a random sample of 1000 men, 60% favored increasing the legal drinking age. Construct a 95% confidence interval for  $p_1 - p_2$ . 38) \_\_\_\_\_
- A) (0.008, 0.092)      B) (-1.423, 1.432)      C) (0.587, 0.912)      D) (-2.153, 1.679)
- 39) A random sample of 100 students at a high school was asked whether they would ask their father or mother for help with a financial problem. A second sample of 100 different students was asked the same question regarding a dating problem. Forty-three students in the first sample and 47 students in the second sample replied that they turned to their mother rather than their father for help. Construct a 98% confidence interval for  $p_1 - p_2$ . 39) \_\_\_\_\_
- A) (-1.324, 1.521)      B) (-0.591, 0.762)      C) (-1.113, 1.311)      D) (-0.204, 0.124)
- 40) Construct a 98% confidence interval for  $p_1 - p_2$ . The sample statistics listed below are from independent samples. 40) \_\_\_\_\_
- Sample statistics:  $n_1 = 1000$ ,  $x_1 = 250$ , and  $n_2 = 1200$ ,  $x_2 = 195$
- A) (1.516, 3.021)      B) (0.047, 0.128)      C) (-0.621, 0.781)      D) (0.581, 1.819)