

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

- 1) A bank's loan officer rates applicants for credit. The ratings can be described by a Normal model with a mean of 200 and a standard deviation of 50. If an applicant is randomly selected, what percentage can be expected to be between 200 and 275? 1) \_\_\_\_\_
- A) 6.68%      B) 5.00%      C) 42.37%      D) 43.32%      E) 93.32%

**Assume that X has a normal distribution, and find the indicated probability.**

- 2) The mean is  $\mu = 15.2$  and the standard deviation is  $\sigma = 0.9$ . Find the probability that X is greater than 16.1. 2) \_\_\_\_\_
- A) 0.1587      B) 0.1550      C) 0.8413      D) 0.1357

**Solve the problem.**

- 3) For a recent English exam, use the Normal model  $N(73, 9.2)$  to find the percent of scores between 56 and 87. Round to the nearest tenth of a percent. 3) \_\_\_\_\_
- A) 9.7%      B) 3.2%      C) 3.37%      D) 96.6%      E) 90.4%

**Find the indicated probability.**

- 4) The incomes of trainees at a local mill are normally distributed with a mean of \$1100 and a standard deviation \$150. What percentage of trainees earn less than \$900 a month? 4) \_\_\_\_\_
- A) 40.82%      B) 9.18%      C) 90.82%      D) 35.31%

**Solve the problem.**

- 5) Human body temperatures are normally distributed with a mean of  $98.20^\circ\text{F}$  and a standard deviation of  $0.62^\circ\text{F}$ . Find the temperature that separates the top 7% from the bottom 93%. 5) \_\_\_\_\_
- A)  $97.28^\circ\text{F}$       B)  $99.12^\circ\text{F}$       C)  $98.78^\circ\text{F}$       D)  $98.40^\circ\text{F}$

**Solve the problem. Round to the nearest tenth.**

- 6) Based on the Normal model for snowfall in a certain town  $N(57, 8)$ , how many inches of snow would represent the 25th percentile? 6) \_\_\_\_\_
- A) 14.3 inches      B) 49 inches      C) 51.6 inches      D) 62.4 inches      E) 65 inches
- 7) Based on the Normal model for car speeds on an old town highway  $N(77, 9.1)$ , what are the cutoff values for the middle 70% of the speeds? 7) \_\_\_\_\_
- A) about 67.5 mph, about 86.5 mph  
 B) about 70.2 mph, about 83.1 mph  
 C) about 23.1 mph, about 130.9 mph  
 D) about 60.2 mph, about 93.7 mph  
 E) about 50.1 mph, about 103.9 mph

**Solve the problem.**

- 8) The annual snowfall in a town can be represented by the Normal model  $N(46, 6.8)$ . What amount of snowfall would you expect to be unusually low for this town? 8) \_\_\_\_\_
- A) 39.2 inches      B) 52.8 inches      C) 42.6 inches      D) 25.6 inches      E) 66.4 inches

- 9) In one region, the September energy consumption levels for single-family homes are found to be normally distributed with a mean of 1050 kWh and a standard deviation of 218 kWh. If 50 different homes are randomly selected, find the probability that their mean energy consumption level for September is greater than 1075 kWh. 9) \_\_\_\_\_
- A) 0.0438                      B) 0.2090                      C) 0.4562                      D) 0.2910

- 10) The annual precipitation amounts in a certain mountain range are normally distributed with a mean of 78 inches, and a standard deviation of 16 inches. What is the probability that the mean annual precipitation during 64 randomly picked years will be less than 80.8 inches? 10) \_\_\_\_\_
- A) 0.5808                      B) 0.9192                      C) 0.0808                      D) 0.4192

**Determine whether the given procedure results in a binomial distribution. If not, state the reason why.**

- 11) Spinning a roulette wheel 8 times, keeping track of the winning numbers. 11) \_\_\_\_\_
- A) Not binomial: there are more than two outcomes for each trial.  
B) Procedure results in a binomial distribution.  
C) Not binomial: the trials are not independent.  
D) Not binomial: there are too many trials.
- 12) Spinning a roulette wheel 7 times, keeping track of the occurrences of a winning number of "16". 12) \_\_\_\_\_
- A) Not binomial: there are too many trials.  
B) Not binomial: there are more than two outcomes for each trial.  
C) Not binomial: the trials are not independent.  
D) Procedure results in a binomial distribution..

**Find the indicated probability.**

- 13) An archer is able to hit the bull's-eye 55% of the time. If she shoots 8 arrows, what is the probability that she gets exactly 4 bull's-eyes? Assume each shot is independent of the others. 13) \_\_\_\_\_
- A) 0.2627                      B) 0.0038                      C) 0.0915                      D) 0.7373                      E) 0.1719

**Find the probability of the outcome described.**

- 14) A beginning archer is able to hit the bull's-eye 39% of the time. If she shoots 9 arrows, what is the probability that she gets at most 3 bull's-eyes? Assume each shot is independent of the others. 14) \_\_\_\_\_
- A) 0.4922                      B) 0.5078                      C) 0.2511                      D) 0.2567                      E) 0.0270
- 15) A multiple choice test has 7 questions each of which has 5 possible answers, only one of which is correct. If Judy, who forgot to study for the test, guesses on all questions, what is the probability that she will answer no more than 3 questions correctly? 15) \_\_\_\_\_
- A) 0.996                      B) 0.033                      C) 0.967                      D) 0.029                      E) 0.852

**Solve the problem.**

- 16) In the town of Blue Valley, 6% of female college students suffer from manic-depressive illness. If 170 of the female students are selected at random, what is the mean of the number who suffer from manic-depressive illness? 16) \_\_\_\_\_
- A) 85                      B) 10.2                      C) 3.10                      D) 159.8                      E) 9.59

- 17) A tennis player makes a successful first serve 59% of the time. If she serves 23 times, what is the standard deviation of the number of good first serves? Assume that each serve is independent of the others. 17) \_\_\_\_\_
- A) 11.5                      B) 2.36                      C) 5.5637                      D) 9.43                      E) 13.57

**Provide an appropriate response.**

- 18) A tennis player usually makes a successful first serve 74% of the time. She buys a new racket hoping that it will improve her success rate. During the first month of playing with her new racket she makes 373 successful first serves out of 460. Is this evidence that with the new racket her success rate has improved? In other words, is this an unusual result for her? Explain. 18) \_\_\_\_\_
- A) Yes; we would normally expect her to make 340.4 first serves with a standard deviation of 88.50. 373 is 0.4 standard deviations above the expected value. That's an unusual result.
- B) Yes; we would normally expect her to make 340.4 first serves with a standard deviation of 9.41. 373 is 3.5 standard deviations above the expected value. That's an unusual result.
- C) No; we would normally expect her to make 340.4 first serves with a standard deviation of 88.50. 373 is 0.4 standard deviations above the expected value. That's not an unusual result.
- D) No; we would normally expect her to make 340.4 first serves with a standard deviation of 18.45. 373 is 1.8 standard deviations above the expected value. That's not an unusual result.
- E) No; we would normally expect her to make 340.4 first serves with a standard deviation of 9.41. 373 is 3.5 standard deviations above the expected value. That's not an unusual result.

**Use the confidence level and sample data to find a confidence interval for estimating the population  $\mu$ .**

- 19) Test scores:  $n = 74$ ,  $\bar{x} = 40.7$ ,  $\sigma = 7.6$ ; 98 percent 19) \_\_\_\_\_
- A)  $39.2 < \mu < 42.2$                       B)  $38.6 < \mu < 42.8$                       C)  $38.4 < \mu < 43.0$                       D)  $39.0 < \mu < 42.4$
- 20) A random sample of 95 light bulbs had a mean life of  $\bar{x} = 531$  hours with a standard deviation of  $\sigma = 33$  hours. Construct a 90 percent confidence interval for the mean life,  $\mu$ , of all light bulbs of this type. 20) \_\_\_\_\_
- A)  $525 < \mu < 537$                       B)  $523 < \mu < 539$                       C)  $524 < \mu < 538$                       D)  $522 < \mu < 540$
- 21) 41 packages are randomly selected from packages received by a parcel service. The sample has a mean weight of 20.6 pounds and a standard deviation of 3.2 pounds. What is the 95 percent confidence interval for the true mean weight,  $\mu$ , of all packages received by the parcel service? 21) \_\_\_\_\_
- A)  $19.8 < \mu < 21.4$                       B)  $19.6 < \mu < 21.6$                       C)  $19.3 < \mu < 21.9$                       D)  $19.4 < \mu < 21.8$

## Answer Key

Testname: SAMPLE TEST 3

- 1) D
- 2) A
- 3) E
- 4) B
- 5) B
- 6) C
- 7) A
- 8) D
- 9) B
- 10) B
- 11) A
- 12) D
- 13) A
- 14) B
- 15) C
- 16) B
- 17) B
- 18) B
- 19) B
- 20) A
- 21) B