

Form: A

_____/100 pts

True/False: Indicate whether the statement is true or false. Questions are worth 2 points each.

1. **T** / **F** The number of speeding tickets you received last year is an example of a discrete random variable.
2. **T** / **F** The sum of all probabilities in any discrete probability distribution is not always exactly one, since some of the probabilities may be slightly larger than one.
3. **T** / **F** A binomial experiment always has at least three possible outcomes to each trial.
4. **T** / **F** Every binomial distribution may be approximated reasonably by an appropriate normal distribution.
5. **T** / **F** All normal probability distributions are symmetric about zero.
6. **T** / **F** The area to the right of $z = 1.52$ is 0.4357
7. **T** / **F** Assume that x is a normally distributed random variable with a mean of μ and standard deviation of σ . If x is converted to the standard score z , then given any three of the values of x , μ , σ , and z , we can always find the fourth value.
8. **T** / **F** If the random variable z is the standard normal score, then the area to the left of $z = 0.50$ is equal to the area to the right of $z = -0.50$.
9. **T** / **F** As the sample size increases, the sampling distribution of the sample means from a normal distribution has a normal curve that becomes more peaked.
10. **T** / **F** Central Limit Theorem states that the sampling distribution of sample means will more closely resemble the normal distribution regardless of the sample size.

Multiple Choice: Identify the choice that best completes the statement or answers the question. 5 points each.

- c 11. Given that the numbers 1 through 6 are equally likely to occur, what is $P(x \leq 2)$?
- a. Cannot be determined since we do not know the probability for each number.
 - b. $\frac{1}{2}$
 - c. $\frac{1}{3}$
 - d. $\frac{1}{6}$
- b 12. Which of the following statements is true?
- a. A probability distribution of a discrete random variable x cannot be presented graphically.
 - b. A probability distribution of a discrete random variable x can be presented graphically as a line graph or probability histogram.
 - c. $P(x) = x / 12$ for $x = 1, 2, 3$, and 4 is a probability function of a discrete random variable x .
 - d. None of the above
- a 13. Find all values of k so that the following is a probability distribution:

x	$P(x)$
1	0.15
2	$2k$
3	0.52
4	k

- a. 0.11 b. 0.50 c. 0.22 d. 1.00

b 14. Find the mean of the following distribution:

x	$P(x)$
1	0.25
2	0.25
3	0.25
4	0.25

- a. 1.12 b. 2.50 c. 0.25 d. 1.00

 c 15. Which of the following is true regarding a binomial distribution for $n = 50$ and $p = 0.4$?

- a. The mean equals 25.
- b. The variance equals 0.24.
- c. The probability for $x = 50$ is 1.26×10^{-20} .
- d. The distribution is not symmetrical.

 b 16. The binomial coefficient $\binom{10}{3}$ equals which of the following?

- a. $10! / 3!$
- b. 120
- c. 720
- d. 30

 c 17. Consider the binomial random variable x with $n = 50$ and $p = 0.5$. Suppose we want to use a normal approximation to find the probability of at least 30 successes. A reasonable approximation would be obtained by computing:

- a. $P(29.5 < x < 30.5)$.
- b. $P(x < 30.5)$
- c. $P(x > 29.5)$
- d. $P(59.5 < x < 100.5)$

 c 18. If 15% of the population is left-handed, find the probability that in a class of 35 students that 3 or fewer are left-handed.

- a. 0.15 b. 0.45 c. 0.20 d. 0.80

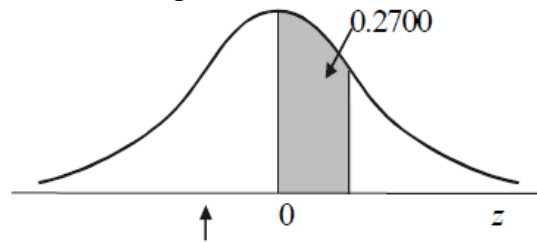
 b 19. If the random variable z is the standard normal score, which of the following probabilities could easily be determined without referring to a table?

- a. $P(z > 2.86)$
- b. $P(z < 0)$
- c. $P(z < -1.82)$
- d. $P(z > -0.5)$

 b 20. The area under the normal curve between $z = -1.0$ and $z = -2.0$ is

- a. 0.3413.
- b. 0.1359.
- c. 0.4772.
- d. 0.0228.

d 21. Find z for the shaded area represented.



- a. 0.11
- b. 0.23
- c. 0.51
- d. 0.74

d 22. Scores on a computer science aptitude test are normally distributed. The standard deviation of the distribution is 6.0, and the 95th percentile for the test is 92. Find the mean score for this test.

- a. 1.65
- b. 0.50
- c. 101.9
- d. 82.1

c 23. If the random variable z is the standard normal score, then the area to the right of $z = -0.64$ is equal to the area to the left of:

- a. $z = 0.24$
- b. $z = 0.76$
- c. $z = 0.64$
- d. $z = -0.10$

b 24. The random variable x is normally distributed with a mean of 75 and a standard deviation of 15.0. For this distribution, the twenty-third percentile, P_{23} , is

- a. 65.7.
- b. 63.9.
- c. 86.1.
- d. 84.3.

b 25. Consider a large population with a mean of 100 and a standard deviation of 21. A random sample of size

36 is taken from this population. The standard error of the sampling distribution of sample mean is equal to:

- a. 16.67.
- b. 3.50.
- c. 12.25.
- d. 1.71.

c 26. A soft drink bottling machine is set to dispense soft drink into containers labeled 16 ounces. While the actual quantities vary, they are normally distributed with a mean of 16.1 ounces and a standard deviation of 0.015 ounces. If a random sample of 25 bottles was selected, then 90% of the sample would have average weights between

- a. 15.275 and 16.925 ounces
- b. 15.770 and 16.430 ounces
- c. 16.095 and 16.105 ounces
- d. 15.875 and 16.325 ounces