

STATISTICS 2023

NAME, PRINT IN INK _____

EXAM TWO

SIGNATURE, IN INK _____

SPRING 2016

CWID IN INK _____

Once this exam is graded and returned to you retain it for grade verification.

TRUE OR FALSE. Answer with a capital T or F.

(4 points each)

_____ 1. A discrete random variable only has probability on a finite set of values.

_____ 2. The bell-shaped curve and the rectangular-shaped distribution both represent probability density functions of continuous random variables.

_____ 3. The expected value of a variable is mean of the variable and equals the value of the variable with the highest probability.

_____ 4. The total area under a probability density function is always equal to one and indicates the probability for intervals of values for a continuous random variable.

_____ 5. The Normal probability distribution function is left skewed, right skewed, or symmetric depending on the value of the parameter, p , the probability of success on one trial.

Z-table Questions. Write your answer on the line.

(4 points each)

_____ 6. What is z_0 , such that $P(Z < z_0) = 0.0778$?

_____ 7. What does $P(1.85 < Z < 2.27)$ equal?

_____ 8. What does $P(-1.77 < Z < 0.68)$ equal?

_____ 9. Assume that a discrete random variable has five possible values, 5, 15, 25, 35, and 45. If the probability on 5 is 0.4 and the remaining probability is divided equally for the other four values of the variable, what is the probability that the variable is at most 25?

_____ 10. In a challenging shooting competition where the probability of hitting the target is only 0.01, how much is the expected winning if the cost to enter the competition is \$350 and the amount one wins if the target is hit is \$18,725? State your answer with two digits past the decimal.

_____ 11. Ballerinas often have extreme foot problems. The probability that a ballerina has to have foot surgery is 0.24. Out of 7 randomly chosen ballerinas, what is the probability that two or three of them have to have foot surgery? State your answer with three digits past the decimal.

_____ 12. In a folder of accounting files, 3% of the files have an error due to data input. If 6 files are randomly drawn from this folder, what is the probability that fewer than two of the six files have an error due to data input? Round your answer to three digits past the decimal.

_____ 13. If the City of Stillwater has 1.4 armed robberies on average per month, then what is the probability of 4 armed robberies in a month? State your answer with three digits past the decimal.

_____ 14. A dried fruit company in California, bellaviva.com, receives an average of 0.6 online orders per minute. What is the probability that in a randomly chosen minute that website will receive at least one online order? Round your answer to three digits past the decimal.

On IRS tax forms the instructions indicate that it is appropriate to round all entries to whole dollars. The rounding error that results from this is uniformly distributed between the values of -50 cents and +50 cents. Use this information to work the next two problems and consider the problem with cents as the unit.

_____ 15. What is the probability that the rounding error has greater magnitude than 22 cents?

_____ 16. Fifteen percent of the time the rounding error exceeds what positive number of cents?

STATE THE ANSWER. State the answer on the line given.

(4 points each)

Assume that the current annual percentage rate, APR, to obtain a mortgage loan to purchase a house in the US is a normally distributed random variable with a mean of 3.5% and a standard deviation of 0.25%. Use this information to answer the questions on this page.

_____ 17. What is the probability that an APR will exceed 4.05%?

_____ 18. What is the probability that an APR will exceed 3.2%, but will be less than 3.9%?

_____ 19. One and one-half percent of the time an APR value will exceed what amount? State four digits past the decimal.

_____ 20. State the value of the 67th percentile of the variable, APR. Use the closest value in the Z-table.

_____ 21. State the interval of APR values centered on the mean of 3.5% that contains 96.06% of the values of the variable.

STATE THE ANSWER. State the answer on the line given.

(4 points each)

In order to analyze a new chemical form of asphalt, samples of 36 observations were repeatedly drawn from the asphalt mixture at a large chemical factory. The melting temperature of the asphalt is known to be 310 degree Fahrenheit (310°F) with a standard deviation of 3 degree Fahrenheit (3°F). Use this information to address the questions on this page.

_____ 22. What is the probability that the sample mean from the above sampling situation will be greater than 310.9°F ?

_____ 23. Of the sample means that result from the above sampling situation 12.1% of the means will be more than what value?

_____ 24. What is the probability that the sample mean that results from the above sampling situation will be between 310.625°F and 311.34°F ?

_____ 25. State the interval of sample mean values centered on the mean that contains 95% of the sample mean values resulting from the above sampling situation.

