

## Sample Statistics Exam #500

### Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- Which of the following is correct?
  - The probability of a type I error is  $\beta$ .
  - The probability of a type II error is  $(1 - \beta)$ .
  - The probability of a type II error is  $\alpha$ .
  - The probability of a type I error is  $(1 - \alpha)$ .
  - none of the above
- A random sample of 10 items is taken from a normal population. The sample had a mean of 82 and a standard deviation is 26. Which is the appropriate 99% confidence interval for the population mean?
  - $82 \pm z_{0.005}(26)$
  - $82 \pm t_{0.005}(26)$
  - $82 \pm z_{0.01} \frac{26}{\sqrt{10}}$
  - $82 \pm t_{0.005} \frac{26}{\sqrt{10}}$
  - none of the above
- A manufacturer of contact lenses is studying the curvature of the lenses it sells. In particular, the last 500 lenses sold had an average curvature of 0.5. The population is
  - the 500 lenses.
  - 0.5.
  - the lenses sold today.
  - all the lenses sold by the manufacturer.
  - none of the above
- According to the empirical rule, the bell or mound shaped distribution will have approximately 68% of the data within what number of standard deviations of the mean?
  - one standard deviation
  - two standard deviations
  - three standard deviations
  - four standard deviations
  - none of the above
- A random sample of 5 mosquitos is sampled. The number of mosquitos carrying the West Nile Virus in the sample is an example of which random variable?
  - normal
  - student's t
  - binomial
  - uniform
  - none of the above
- A political scientist is studying voters in California. It is appropriate for him to use a mean to describe

- a. the age of a typical voter.
  - b. the party affiliation of a typical voter.
  - c. the sex of a typical voter.
  - d. the county of residence of a typical voter.
  - e. none of the above
7. The long-run average of a random variable is
- a. the expected value
  - b. the coefficient of determination
  - c. the standard deviation
  - d. the mode
  - e. none of the above
8. A manufacturer of women's blouses has noticed that 80% of their blouses have no flaws, 15% of their blouses have one flaw, and 5% have two flaws. If you buy a new blouse from this manufacturer, the expected number of flaws will be
- a. 0.15
  - b. 0.20
  - c. 0.80
  - d. 1.00
  - e. none of the above
9. If population A has a larger standard deviation than population B, which of the following is NOT true?
- a. Population B has a smaller variance than population A.
  - b. The mean of a sample of 20 from population A has a larger standard deviation than the mean of a sample of 20 from population B.
  - c. A typical observation from population A will be farther from the mean of population A than a typical observation from B will be from the mean of population B.
  - d. The mean of a sample from population A will on average be larger than the mean of a sample from population B.
  - e. none of the above
10. An inspector needs to learn if customers are getting fewer ounces of a soft drink than the 28 ounces stated on the label. After she collects data from a sample of bottles, she is going to conduct a test of a hypothesis. She should use
- a. a two tailed test.
  - b. a one tailed test with an alternative to the right.
  - c. a one tailed test with an alternative to the left.
  - d. either a one or a two tailed test because they are equivalent.
  - e. none of the above
11. The manufacturer of Anthony Big's exercise equipment is interested in the relationship between the number of months (X) since the equipment was purchased by a customer and the number of hours (Y) the customer used the equipment last week. The result was the regression equation  $Y = 12 - 0.5X$ . The number 0.5 in the equation means that the average customer
- a. used the equipment for 30 minutes last week.
  - b. who has owned the equipment an extra month used the equipment 30 minutes less last week than the average customer who has owned it one month less.
  - c. who just bought the equipment used it 30 minutes last week.

- d. bought the equipment one-half month ago.
  - e. none of the above
12. A researcher is studying students in college in California. She takes a sample of 400 students from 10 colleges. The average age of all college students in California is
- a. a statistic.
  - b. a parameter.
  - c. the median.
  - d. a population.
  - e. none of the above
13. A sample of 150 new cell phones produced by Yeskia found that 12 had cosmetic flaws. A 90% confidence interval for the proportion of all new Yeskia phones with cosmetic flaws is 0.044 to 0.116. Which statement below provides the correct interpretation of this confidence interval?
- a. There is a 90% chance that the proportion of new phones that have cosmetic flaws is between 0.044 and 0.116.
  - b. There is at least a 4.4% chance that a new phone will have a cosmetic flaw.
  - c. A sample of 150 phones will have no more than 11.6% with cosmetic flaws.
  - d. If you selected a very large number of samples and constructed a confidence interval for each, 90% of these intervals would include the proportion of all new phones with cosmetic flaws.
  - e. none of the above
14. The standard deviation of a normal population is 10. You take a sample of 25 items from this population and compute a 95% confidence interval. In order to compute the confidence interval, you will use
- a. the t table because the degrees of freedom will be 24.
  - b. the t table because you have estimated the standard deviation from the sample.
  - c. the z table because the population standard deviation is known.
  - d. the z table because the sample size is small.
  - e. none of the above
15. You are conducting a one-sided test of the null hypothesis that the population mean is 532 versus the alternative that the population mean is less than 532. If the sample mean is 529 and the p-value is 0.01, which of the following statements is true?
- a. There is a 0.01 probability that the population mean is smaller than 529.
  - b. The probability of observing a sample mean smaller than 529 when the population mean is 532 is 0.01.
  - c. There is a 0.01 probability that the population mean is smaller than 532.
  - d. If the significance level is 0.05, you will accept the null hypothesis.
  - e. none of the above
16. Half of the observations in a data set are greater than the
- a. mean.
  - b. median.
  - c. mode.
  - d. standard deviation.
  - e. none of the above

**Sample Statistics Exam #500**  
**Answer Section**

**MULTIPLE CHOICE**

|            |        |         |
|------------|--------|---------|
| 1. ANS: E  | DIF: 2 | TOP: 2  |
| 2. ANS: D  | DIF: 2 | TOP: 3  |
| 3. ANS: D  | DIF: 2 | TOP: 9  |
| 4. ANS: A  | DIF: 2 | TOP: 1  |
| 5. ANS: C  | DIF: 2 | TOP: 6  |
| 6. ANS: A  | DIF: 2 | TOP: 10 |
| 7. ANS: A  | DIF: 2 | TOP: 5  |
| 8. ANS: E  | DIF: 2 | TOP: 5  |
| 9. ANS: D  | DIF: 2 | TOP: 8  |
| 10. ANS: C | DIF: 2 | TOP: 2  |
| 11. ANS: B | DIF: 2 | TOP: 4  |
| 12. ANS: B | DIF: 2 | TOP: 9  |
| 13. ANS: D | DIF: 2 | TOP: 3  |
| 14. ANS: C | DIF: 3 | TOP: 6  |
| 15. ANS: B | DIF: 2 | TOP: 7  |
| 16. ANS: B | DIF: 1 | TOP: 1  |