# Exam 3 Practice Questions Part I

1. A standard error calculated in a single sample is indicative of ——————— of the sampling distribution.

   A. the standard error

   B. the standard deviation

   C. the interquartile range

   D. the mean absolute deviation

   E. the index of qualitative variation

2. When a correlation is equal to zero, it is reasonable to say the variables are:

   A. independent

   B. disjunct

   C. divisive

   D. inversely correlated

   E. positively correlated

3. Small sample confidence intervals for continuous variables are based on the:

   A. normal or z-distribution

   B. chi square distribution

   C. central limit theorem

   D. t-distribution

   E. Gauss/Yule theorem

4. Which of the following types of estimates communicates uncertainty to a scientific audience?

   A. point estimates

   B. marginal estimates

   C. joint estimates

   D. pooled estimates

   E. interval estimates

5. Suppose we have a random sample of 72 adolescents currently incarcerated in a particular state. The average age at the time each of these people was first arrested is 14.2 and the standard deviation is 1.3. What is the standard error of the mean?

    A. 0.081

    B. 0.024

    C. 0.153

    D. 0.287

    E. 0.302

6. The local police department conducts a study to estimate the fraction of adults in the city who feel unsafe walking in their neighborhood at night. A local research firm collects a random sample of 547 survey responses; 283 of the respondents reported feeling unsafe while the remaining 264 said they had no safety concerns. Based on this information, what is the estimated proportion of people who feel unsafe?

    A. 0.624

    B. 0.517

    C. 0.385

    D. 0.452

    E. 0.583

7. Consider a random sample of 385 people being released from prison. Among these 385 people we learn that 207 of them have at least one prior arrest. What is the lower bound of the 90% confidence interval for the proportion of people released from prison having at least one prior arrest?

    A. 0.579

    B. 0.412

    C. 0.381

    D. 0.497

    E. 0.641

8. The local juvenile court has been keeping track of the hours of community service that a random sample of 8 kids have contributed. Based on these records we obtain the following data points: 14, 21, 27, 35, 18, 25, 21, 18. Estimate the upper bound of the 95% confidence interval for the average number of hours of community service.

      A. 30.452

      B. 27.852

      C. 25.017

      D. 33.365

9. We survey a random sample of American youth and each of the people who participate are asked whether they've been arrested by the police within the past 12 months. Our sample is comprised of 2,422 people with a total of 2087 participants and 335 nonparticipants. Among the participants, 272 report that they had been arrested while the remaining 1,815 said they had not been arrested. What is the lower bound of the partial identification interval for the arrest rate of the entire sample?

    A. 0.112

    B. 0.095

    C. 0.138

    D. 0.130

    E. 0.159

10. Historically, the local court has monitored the waiting time between initial booking at the police department and the first appearance in bond court. Over time, the average waiting time has been estimated at 18 hours. We now consider a random sample of 7 recent arrestees who each had the following waiting times (in hours): 22, 23, 27, 19, 25, 21, 17. The clerk of court has asked us to test the hypothesis that the recent arrestees have an average waiting time that is equal to the historical average (the alternative to our hypothesis is that the recent arrestees have a *longer* average waiting time so this is a directional or one-tailed test). After consulting with a statistician, we choose to use a $p < .01$ significance level for our one-tailed test. What do we conclude?

    A. reject the hypothesis

    B. fail to reject the hypothesis

11. Consider the following contingency table examining the effect of a drug treatment program (randomly assigned to treatment $= 1$ and randomly assigned to control $= 0$) on substance use relapse rates (no relapse $= 0$, relapse $= 1$).

|  | $R = 0$ | $R = 1$ | Total |
|---|---|---|---|
| $T = 0$ | 322 | 165 | 487 |
| $T = 1$ | 373 | 119 | 492 |
| Total | 695 | 284 | 979 |

Based on the information in this table, estimate Yule's $Q$ for this table.

    A. -0.108

    B. -0.143

    C. -0.233

    D. -0.314

    E. -0.181

12. Reconsidering the contingency table in problem 11, estimate a 90% confidence interval for Yule's $Q$. Does the 90% confidence interval you estimated include the number zero?

    A. yes

    B. no

    C. not enough information to tell