

Please show all work and especially show any calculator input for this test. No work or calculator input will result in no credit given (even if your answer is correct).

I. Short Answer and Multiple Choice. (43 points total)

1. Write "true" or "false" next to each statement according to which is correct. (2 points each - 6 points total)

F Keeping the sample size fixed, the margin of error for a z-confidence interval for a population mean μ will increase if the confidence level is decreased.

T At the same level of confidence, the margin of error for a z-confidence interval for a population mean μ will decrease if the sample size is increased.

F If the hypothesis test: $H_0: \mu = \mu_0$ versus $H_a: \mu \neq \mu_0$ for a population mean μ is significant at the $\alpha = 0.05$ level, then the corresponding 95% confidence interval for μ will contain μ_0 .

2. Subjects in a weight loss experiment are put on a special diet. The subjects are weighed at the beginning of the diet and weighed six weeks later at the end of the diet. Which of the following tests of significance will you use to determine if the diet was successful? (2 points)

(a) The two sample t-test.

(b) The paired t-test.

(c) The z-test for the difference between two population proportions.

(d) The z-test for a population proportion.

3. A recent Associate Press-AOL News poll reported that 43% of Americans trust Democrats to do a better job of protecting the country. This result was based on a sample of 2000 Americans with a margin of error of 2.2% with 95% confidence. What is the corresponding confidence interval for the true proportion of Americans that trust Democrats to do a better job of protecting the country? (3 points)

$$.43 \pm .022 \rightarrow \boxed{(0.408, 0.452)}$$

4. Give the definition of a p-value for a hypothesis test (4 points): *The p-value is the likelihood (or probability) of obtaining a result as extreme as the data, in the direction of the alternative hypotheses, assuming the null hypothesis is true.*

5. Fill in the blanks: If we computed a 92% t-confidence interval for the mean age (in years) of oak trees in Farmville to be (45 years, 130 years) then the margin of error is equal to 42.5 years and the sample mean age is equal to 87.5 years. (3 points each - 6 total)

$$\frac{130 - 45}{2} = 42.5$$

$$\frac{45 + 130}{2}$$

