

MTH 324, Exam #2, Fall 2022 Name _____

Instructions: Answer each question thoroughly. For questions in Part 1, use the work you did at home to answer the questions. Be sure to answer each part of each question. In Part 2, report exact answers unless directed to round.

Part I:

Use the work you did at home to answer these questions about tax paid and the neighborhoods in our dataset.

1. State your null and alternative hypotheses for the husbands and wives question.
2. What kind of test did you conduct? What is the P-value for your tests?
3. What do you conclude from your test? State your conclusion in plain language in context.
4. What is the null and alternative hypotheses for your one-way ANOVA?
5. What were the results of your test? Using Tukey's method and a box plot, which machines need to be recalibrated the most. Explain your reasoning.

11. State the null and alternative hypotheses for your one-sample test of school debt levels. What is your P-value? What did you conclude?

12. For your sampling distribution, describe the shape of the distribution.

13. What is the mean of your means? What is the mean of the data? Are they similar?

14. What is the standard deviation of your means? What is the standard deviation of the data? Given that you took samples of size 50, what is the predicted standard error from the central limit theorem? Is it similar to what you simulated?

19. If you want to determine the appropriate sample size needed to conduct a poll with just at 2% margin of error for a proportion, with a 95% level of confidence, use the formula $n = p(1 - p) \left(\frac{z^*}{E}\right)^2$. Use this formula with $p = 0.5$ to estimate the sample size needed.

20. Describe what a Latin Square design is. Give an example of a Latin Square design for three levels of data, each with 4 levels each.