STATISTICS 641 - FINAL EXAM - SOLUTIONS

I. (80 points) PLACE ONE of the following letters (**A, B, C, D, or E**) corresponding to the **BEST** answer on the **Answer Sheet - Page 9** of the Exam.

(1.) **A** Strata are 20 Divisions in the State Department - random sample of 1000 is taken in each Division

(2.) **E** Strata are 4 Regions, States are Clusters of Counties, Counties are Clusters of Business Owners

(3.) **C** Weibull - modeling maximum crack size

(4.) **C** A studentized Bootstrap confidence interval - Transformations inappropriate for CI on Means

(5.) **C** D is Poisson($\lambda = 5$), $P[D \leq 5] = .616 < .65 < .762 = P[D \leq 6]$

(6.) **A** Type I censoring - Study terminated after 30 Days

(7.) **A** Anderson-Darling statistic measures fit of continuous distributions

(8.) **C** Chi-square GOF statistic measures for of discrete distributions

(9.) **E** None of the above are correct interpretations.

(10.) **B** Sign test has greater power than t-test when distribution is very heavy tailed

(11.) **B** the actual level of significance will be greater than 0.05 due to right skewness

(12.) **C** Significance level will be higher than the specified value due to unequal variances

(13) **B** Power at $\tilde{\mu} = 18\%$ is .875

(14) **D** below the power function for the t-Test for values of $\tilde{\mu}$ less than 21 and above for values of $\tilde{\mu}$ greater than 21.

(15.) **D** Separate variance t-test because box plot indicates unequal variances but data is from normal distributions

(16.) **C** Pairing would reduce the power of the t-test because pairing was not needed

(17.) **A** very close to 0.05 because the individual measurements were averaged and the averages are independent

(18.) **A or E** Heavy tailed distributions

19.) **B** Bonferroni adjusted Wilcoxon Rank Sum Test - Comparing multiple pairs of averages with non-normal data

(20.) **D** Wilcoxon Signed Rank test - Paired Data with non-normally distributed differences

II. **(20 points, 2 points each)** **INSTRUCTIONS** Write the **ONE** number from the column on the right which **BEST** matches the statement in the column on the left. Note, there may be multiple correct responses and there may be items in the column on the right which are unused. Only **ONE** answer should be given for each statement in the column on the left.

<u>14......</u> An index of weight of evidence that data
      supports null hypothesis
<u>17.....</u> A function which contains both
      the probability of I and II errors.
<u>10.....</u> Method for evaluating differences in proportions
      when confounding variable is present
<u>22.....</u> Technique for determining sampling distribution
      of C.I. pivot when n is small
<u>12.....</u> Method for comparing the Odds Ratios
      of k treatments of a disease
<u>23.....</u> An estimator of survival function
      when data has censored values
<u>34.....</u> A procedure which generates k confidence intervals
      having a 95% overall coverage probability
<u>5......</u> Test for homogeneity of $k > 2$ population variances
      when the population pdf's are heavily skewed
<u>3......</u> Measure of how well a Poisson distribution
      fits data summarizing the occurrence of tornados
<u>35.....</u> A method of estimating parameters
      when pdf is specified

1. Kolmogorov-Smirnov statistic
2. Anderson-Darling statistic
3. Chi-squared GOF statistic
4. Shapiro-Wilk statistic
5. Levene-Brown-Forsythe statistic
6. Spearman's Correlation
7. Pearson's Product-Moment Correlation
8. Fisher's Exact test
9. McNemar's test
10. Cochran-Mantel-Haenszel test
11. Pearson Chi-square Test
12. Breslow-Day test
13. Simpson's Paradox
14. p-value
15. Probability of Type I Error
16. Probability of Type II Error
17. Power of test
18. Specificity of test
19. Sensitivity of test
20. Satterthwaite Approximation
21. Box-Cox Technique
22. Bootstrapping
23. Kaplan-Meier PLE
24. Empirical distribution function
25. Wilcoxon Rank Sum test
26. Wilcoxon Signed Rank test
27. Sign test
28. Pooled t-test
29. Welch-Satterthwaite t-test
30. Paired t-test
31. Confidence Interval
32. Tolerance Interval
33. Prediction Interval
34. Bonferroni Interval
35. Maximum Likelihood
36. Method of Moments
37. edf-based estimators
38. Kernel Density estimator
39. Relative Frequency Histogram
40. Random censoring
41. Left censoring
42. Right censoring
43. Type I censoring
44. Type II censoring
45. Non-Random censoring

FINAL Exam Scores for STAT 641

Min = 52, Q(.25) = 77, Q(.5) = 83, Mean = 81.9 , Q(.75) = 90, Max = 100