CALCULATIONS (40 points):

Please use pencil, and put all of your answers on this paper. You must do **all** of the questions, and show all appropriate work. Please **draw a circle around each answer** unless otherwise instructed.

1. (30 points)   A researcher investigated how many databases a sample of clients searched in at a community center with links to the local community college. These patrons used the following number of databases during the observation period:

   1, 0, 0, 4, 3, 4, 2, 3, 3, 8, 4, 1, 0, 0, 1, 3, 1, 1, 6.

(a) What is the case in this example? (2 points)

(b) What is the variable of interest? (2 points)

(c) In the space below, generate the full frequency distribution of the sample using class examples as models. **Do not circle** the frequency distribution. (6 points)

(d) What is the mean of the distribution? (2 points)

(e) What is the standard deviation of the distribution? (3 points)

(f) Generate a 99% confidence interval on μ. (6 points)

(g) Draw the frequency polygon for this distribution. Do not circle it. (3 points)

(h) Draw the box plot of the distribution. Do not circle it. (6 points)

2. (10 points)   A behavioral scientist wanted to more fully understand people's use of
                  networked communication applications, focusing on the participants'
                  educational level. She identified the mean number of applications used by
                  three groups of people: people with only a high school education/GED or less
                  (μ_1), people with only some college experience (μ_2), and people with some
                  graduate experience (μ_3).

(a) Using a χ^2 analysis, test the following null hypothesis for the data below. (8 points)

     H_0: $\mu_1 = \mu_2 = \mu_3$ ($\alpha = 0.01$).

     Of the people in the first educational group, 22 used two or fewer applications, 16 used three
     to five, and 19 used more than five. In the second educational group, 34 used two or fewer
     applications, 18 used three to five, and 23 used more than five. In the last educational group,
     10 used two or fewer applications, 8 used three to five, and 17 used more than five.

(b) Can we use phi as an effect size index for this data set? Why or why not? (2 points)

(random) student number _____

CONCEPTS (20 points):

Please use pen, and put all of your answers on this paper. Use only the space provided.

I. (5 points) Please define **five (5)** of the following terms (1 point each).

    Unit of analysis

    Standard deviation

    Informed consent

    Parameter

    Sampling distribution of the mean

    Coefficient of risk

    Parsimony

    Informant

II. (3 points) Please mark each of the statements below as true (T) or False (F). (1 point each)

    Inferential statistics can help us estimate the amount of noise in data.   _____

    Member checking helps to determine the size of a sample.   _____

    We use operational definitions to address ethical problems in research.   _____

III. (12 points) Respond to **two (2)** of the following questions or statements. Limit your answer to the space provided. (6 points each)

a. What is the relationship between reliability and validity of measures?

b. What does it mean to do statistical inference?

c. When reading others' research, what are the important responsibilities of the skeptical, informed reader?

DO NOT WRITE BELOW THIS LINE