Directions and Sample Questions for Second Exam

PART I. Observation

A. Indicate the *best* answer to each the following multiple-choice questions (30 points)

1. For classifying furniture, the categories dining table, desk chair, bookcase, lamp, are
        a. exhaustive and exclusive
        b. exhaustive but not exclusive
        c. exclusive but not exhaustive
        d. neither exclusive nor exhaustive

2. In naturalistic observational research, which of the following should *not* occur
        a. observation is performed indoors
        b. the observer manipulates events
        c. a video record is made of the event
        d. behavior is coded into categories

3. Jane Goodall's decision to use binoculars in her research on chimpanzees in Gombe National Park presumably reflected her concern with:
        a. reliability
        b. reactivity
        c. observer bias
        d. artifactual results

4. The reactivity bias involves
        a. researchers becoming upset with the participants in the study
        b. participants in a study altering their behavior as a result of being observed
        c. participants in a study becoming upset with the researchers and destroying the study
        d. researchers' reports being influenced by their expectations

5. Which of the following is not true?
        a. One is performing time sampling if one records data from every third sale at a store
        b. One is performing event sampling if one records data from every 10th person to check
            a book out at the library
        c. One is performing time sampling if one records traffic conditions every 10 minutes
        d. One is performing situation sampling if one records events at different coffee shops

6. When a nominal variable is expressed in terms of numbers, it uses the numbers
        a. only as names
        b. to specify rank ordering
        c. to quantify differences between items
        d. to specify ratios between items

7. When the American Podiatrist Association evaluates its members as *highly qualified*, *qualified*, and *unqualified*, it is employing:
    a. a nominal variable
    b. an ordinal variable
    c. an interval variable
    d. a ratio variable

8. Which of the following is a measure of central tendency?
    a. standard deviation
    b. variance
    c. range
    d. mode

9. Which of the following is not true?
    a. In some distributions, the mode is larger than the median
    b. In some distributions, the median is larger than the arithmetic mean
    c. In some distributions, the arithmetic mean is larger than the standard deviations
    d. In some distributions, the standard deviation is larger than the variance

10. Which of the following is true of a normal distribution?
    a. The scores are equally distributed across the range
    b. There are fewer scores further from the peak
    c. The peaks are equally distributed across the range
    d. There are more scores further from the peak

11. If the distribution is normal, what percent of scores lie within 2 standard deviations of the mean?
    a. ~50%
    b. ~68%
    c. ~95%
    d. ~99%

12. In order to estimate how close the mean of the actual population is to the mean of a sample, one needs to know
    a. the median of the sample
    b. the standard deviation of the actual population
    c. the standard deviation of the sample
    d. what percentage of the population was actually sampled

The following questions are based on this scenario:
    How much of their awake time do marmots spend eating? To answer this question, a researcher videotaped several hours of marmot behavior from an inconspicuous location and then arranged for students to code the marmot behavior into a number of exclusive and exhaustive categories, identifying at each time which behavior the marmot was exhibiting.

13. The investigator in this study was
      a. a participant observer
      b. conducting an experiment
      c. engaging in structured observation
      d. engaging in naturalistic observation

14. The length of time spent eating is a
      a. nominal variable
      b. ordinal variable
      c. interval variable
      d. ratio variable

15. If in the sample observations the mean number of minutes eating per hour during the observation period was 16 minutes and the standard deviation was 4 minutes, then
      a. with 68% confidence, the mean in the sample is between 12 and 20 minutes
      b. with 68% confidence, the mean of the actual population is between 8 and 24 minutes
      c. with 95% confidence, the mean of the actual population is between 4 and 28 minutes
      d. with 95% confidence, the mean of the actual population is between 12 and 20
          minutes

B. Answer the following questions in a short paragraph. (20 points)

1. What aspects of perception is illustrated by the drawing on the left? What challenge does this pose to scientists? Explain in some detail.

2. Why is it important to plan carefully the coding system that will be used in an observational study? What can go wrong if one has a poorly designed coding system?

Part II: Correlation

A. Indicate the *best* answer to each the following multiple-choice questions (30 points)

1. Correlations are
      a. useful because they always relate score variables.
      b. not useful because they do not demonstrate causal relations.
      c. useful because they can be used to make predictions.
      d. not useful when they are negative.

2. To make a prediction from a new value of the predictor variable based on a correlation between two score values, you
- a. multiply the Pearson correlation coefficient by the new predictor value and add the value of the y-intercept.
- b. multiply the new predictor value by the slope of the regression line and add the value of the y-intercept.
- c. divide the new predictor value by the slope of the correlation line and add the value of the y-intercept.
- d. add the new predictor value to the slope of the correlation line and divide by the value of the y-intercept.

3. For SAT scores to be a legitimate factor in determining college admissions,
- a. colleges must align their curriculum with the questions used on the SAT.
- b. SAT scores must be a direct (proximal) cause of success in college.
- c. SAT scores must be a cause (direct or indirect) of success in college.
- d. there must be a correlation between SAT scores and success in college.

4. The diagram to the right is an example of a
- a. histogram illustrating a lack of correlation between tobacco and alcohol.
- b. scatterplot illustrating a perfect correlation between tobacco and alcohol.
- c. scatterplot illustrating a positive correlation between tobacco and alcohol.
- d. histogram illustrating a positive correlation between tobacco and alcohol.
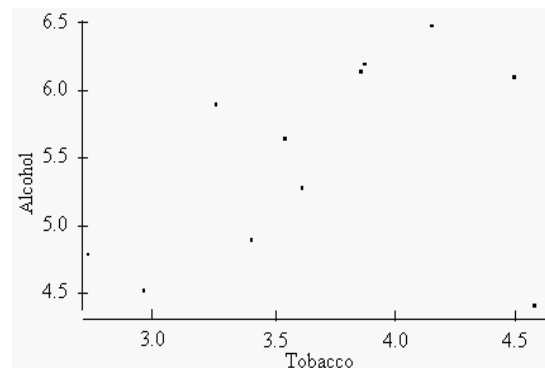
5. Which of the following choices best explains the concept of an "operational definition"?
- a. It supplies sufficient conditions for a variable.
- b. It provides necessary conditions for a variable.
- c. It provides necessary and sufficient conditions for a variable.
- d. It relates variables used in a hypothesis to measurable variables.

6. Using the number of items a person can recall has high construct validity as a measure of memory if it
- a. does not involve an operational definition of memory.
- b. is only employed in a limited range of settings.
- c. reliably assigns the same scores to the same individuals on different occasions.
- d. actually measures memory.

7. If all the points on a scatter plot lie on a straight line with positive slope
   a. the Pearson coefficient will be 0.5.
   b. the regression coefficient will be 1.0.
   c. 100% of the variance is explained by the correlation.
   d. one cannot tell what the Pearson coefficient will be.

8. You have found a correlation of .42 between two variables in a sample of people. Why do you need to determine whether the correlation is statistically significant?
   a. There could be a correlation in the sample but none in the actual population.
   b. There could be a correlation in the actual population but none in the sample.
   c. Although there is a correlation, it might not be very important.
   d. There may be very different reasons for the correlation in the actual population than in the sample.

9. Which of the following makes no sense?
   a. $p < .10$
   b. $r = .5$
   c. $p = -.05$
   d. $r = -.95$

10. If the regression line for the correlation between *hours of sleep* (S) and *memory score* (M) is M = -.72S + 16,
   a. $r = 16$
   b. $r = -.72$
   c. $r < 0$
   d. $r = .49$

11. The p-value reported in a correlational study corresponds to
   a. the probability of making Type II error.
   b. the slope of the regression line.
   c. the probability of getting your result when the null hypothesis is true.
   d. the probability that the null hypothesis is true, given your result.

12. Jason won the sales competition in a local store in September and November. To explain why he didn't win in October, he should
   a. identify the intercept on the regression line.
   b. appeal to regression to the mean.
   c. complain that others cheated.
   d. calculate the Pearson coefficient.

13. In doing a test of statistical significance, you will have made a Type I error if you conclude that
- a. there is no difference between means in the population when in fact there is a difference.
- b. there is a difference between means in the population when in fact there is no difference.
- c. the absence of a difference in the samples is due to chance.
- d. any difference in the samples is due to chance.

14. When would it be particularly important not to make a Type II error?
- a. When it is critical that you don't claim a difference when there isn't one.
- b. When Type I errors cannot be further reduced.
- c. When it is critical not to miss a difference when there is one.
- d. When finding a difference between means is extremely costly.

15. Which premise is required for an argument confirming a correlational claim to be valid
- a. If there is a correlation in the actual population, then the correlation in the sample will be statistically significant.
- b. If there is a correlation in the actual population, then the correlation in the sample will not be statistically significant.
- c. If there is not a correlation in the actual population, then the correlation in the sample will be statistically significant.
- d. If there is not a correlation in the actual population, then the correlation in the sample will not be statistically significant.

B. Answer the following questions in a paragraph (20 points)

1. A given study set out to show that how much a person walked correlated negatively with how often they caught a cold. The results failed to achieve significance at the .05 level. What conclusion should one draw from the study? What should the researchers do if they still thought there was a correlation in the actual population? Why?

2. Explain the difference between Type I and Type II errors. What strategies should researchers adopt if they are particularly concerned not to commit a Type I error? Why? What strategies should researchers adopt if they are particularly concerned not to commit a Type II error? Why?