Directions and Sample Questions for First Exam

I. Logic and Basic Scientific Reasoning

A. Basic concepts: Select the *best* answer to the following multiple choice questions about basic concepts of logic and scientific reasoning as used in this course (10 points)

> An argument is
> > a. a conflict between two or more individuals
> > b. a discourse designed to convince someone to accept a conclusion
> > c. a set of statements, some of which are offered to justify others
> > d. none of the above

B. Conditionals: Select the *best* answer to the following multiple choice questions about conditional statements. (15 points)

> "Only if you follow the directions will you pass the exam" is logically equivalent to which of the following statements?
> > a. If you follow the directions, you will pass the exam
> > b. You will pass the exam if you follow the directions
> > c. If you pass the exam, you followed the directions
> > d. Unless you passed the exam, you followed the directions.

> The statement "Only if you follow the directions will you pass the exam" is false when
> > a. You followed the directions and passed the exam
> > b. You followed the directions and did not pass the exam
> > c. You did not follow the directions and passed the exam
> > d. You did not follow the directions and did not pass the exam

C. Conditional arguments: Identify the form of each of the following conditional arguments AND whether it is valid or not. (15 points)

> If you passed the exam then you followed the directions and you followed the directions. Therefore you will you pass the exam.

> a. Modus ponens   b. Modus tollens
> c. Affirming the consequent   d. Denying the antecedent

> e. Valid   f. Invalid

D. Evidential Relations: Answer the following questions about the logical relations involved in evaluating hypotheses, including showing the form of argument involved, and illustrate with an example in a short paragraph. (15 points)

> What is the logical form of a falsification? Illustrate with an example. Give two reasons (other than laziness or conservatism) why researchers might reasonably not reject a hypothesis even if the predictions made from it are false.

II. Observation

A. Observation, Categorization, and Taxonomy: Answer the following questions about observation, categorization, and taxonomy in a short paragraph, making it clear how it illustrates a feature of science. (15 points)

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

B. Basic concepts: Select the *best* answer to the following multiple choice questions about terms used to describe features of observational research, including variables and their measurement. (10 points)

A nominal variable
  a. uses numbers only as names
  b. uses numbers to specify rank ordering
  c. uses numbers to quantify differences between items
  d. uses numbers to specify ratios between items

C. Observational research, variables, and measurement: Select the *best* answer to the following true/false, matching, or multiple choice questions.   (20 points)

What percent of scores lie within 2 standard deviations of the mean of a distribution?
  a. 50%
  b. 68%
  c. 95%
  d. 99%