Directions and Sample Questions for First Exam

I. Argumentation

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)

Which of the following could be a counterexample to a definition of *dog*
  a. an example that shows that dogs have surprising new properties
  b. a turkey that satisfies the conditions in the definition
  c. an cat that satisfies the necessary conditions for being a dog.
  d. a dog that does not satisfy one set of sufficient conditions for being a dog

Which of the following statements is a tautology?
  a. Dogs have four legs.
  b. Dogs do not like cats.
  c. If something barks, then it is a dog.
  d. Only animals are dogs.

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

Which of the following is an example of a valid statement?
  a. A bachelor is an unmarried male.
  b. The longest day of the year is in June.
  c. Can you help me with this?
  d. None of the above

In the statement "The dog won't bite unless you threaten" "the dog bites" is
  a. a necessary condition for you threatening
  b. neither a necessary nor a sufficient condition for you threatening
  c. a sufficient condition for you threatening
  d. both a necessary and a sufficient condition for you threatening

Which of the following is not a conclusion indicator?
  a. therefore
  b. since
  c. thus
  d. proves that

In a valid argument with a false conclusion
  a. all the premises must be true
  b. at least one premise must be false
  c. the premises may be either true or false
  d. you cannot tell anything about the truth of the premises

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

The statement "If there is a storm, we will get wet" is false when:
a. There is not a storm and we get wet.
b. There is a storm and we get wet.
c. There is not a storm and we do not get wet.
d. There is a storm and we do not get wet.

"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

The statement "Unless New York wins, San Diego is out of the race" is logically equivalent to which of the following:
a. If New York wins, San Diego is out of the race
b. New York wins only if San Diego is out of the race
c. If San Diego is out of the race, New York wins
d. If New York does not win, San Diego is out of the race

The statement "They will die unless a cure is found" is logically equivalent to which of the following
a. If they do not die, then a cure was found
b. If a cure is found, they will not die
c. If they die, a cure was not found
d. Only if a cure was not found will they die

C. Conditional arguments: Identify the form of each of the following conditional arguments AND whether it is valid or not. Both parts must be correct to get credit for the question (15 points)

If you passed the exam then you followed the directions. Moreover, you followed the directions. Therefore you passed the exam.

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

e. Valid   f. Invalid

If there is still fruit on the plate, it is poisoned. But there is no fruit on the plate. Therefore it is not poisoned.

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

e. Valid   f. Invalid

The defendant is not guilty because she is smiling and if she were guilty she would not be smiling.

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

e. Valid   f. Invalid

There will be more traffic accidents in the future. We know this because the number of drivers is increasing, and if the number of drivers increases, there will be more traffic accidents.

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

e. Valid   f. Invalid

D. Logic and 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)

Explain in your own terms what makes the following argument good or bad. Do not just use terms like *valid* or *sound*, but explain what they mean. "There is going to be a major recession in the next year. We can conclude this because whenever there is a major recession, it is preceded by turmoil in the equity markets. And there is certainly turmoil in the equity markets right now.

What is a prediction in science? Provide an example. What is its relation to a hypothesis? Show how your example prediction relates to a hypothesis.

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. (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.

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?

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)

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

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

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

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 are influenced by their expectations

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

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

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

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

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

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 for each moment which behavior the marmot was exhibiting.

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

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

>   The student coders were performing
>   >   a. continuous coding
>   >   b. time sampling
>   >   c. event sampling
>   >   d. situation sampling