Phil 12
Fall, 2015

Directions and Sample Questions for First Exam

I. Logic and the Basics of 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)

1. The term theory refers to what?
        a. a hypothesis that has not been tested
        b. a systematic set of hypotheses
        c. a hypothesis that has been thoroughly tested
        d. a hypothesis that has not been subject to careful testing

2. Which of the following is not a counter example to the definition of a college as a place to study
        a. a high school where everyone studies
        b. a library
        c. a private college
        d. a college at which no one studies

3. Which of the following is a contradiction?
        a. Everything that is fun costs money.
        b. Everyone always wants more money.
        c. Money is required but is not needed.
        d. Having lots of money is not always a good thing.

4. Which of the following is a tautology?
        a. Human beings are mortal.
        b. Codex is a monkey and Kwan is a StarCraft world champion.
        c. If Clara is either tall or not tall, then she both is and is not a frost mage.
        d. If Zaboo is a warlock, then Vork either is a warrior or Vork is not a warrior.

5. Which of the following is a counterexample to the definition of a box as a rigid container with a cover?
        a. a box that is not rigid
        b. a covered container that is not rigid
        c. a covered container that is not a box
        d. something rigid that is not a box

6. What can we say about a valid argument if we know that the premises are false?
        a. It is sound
        b. The conclusion is also false
        c. The conclusion is true
        d. None of the above

7. Which of the following statements is true?
        a. A valid argument has true premises and a true conclusion
        b. A valid argument cannot have a false premise
        c. If the conclusion of a valid argument is false, so must be at least one premise
        d. A valid argument cannot have false premises and a true conclusion

8. 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

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

10. If a valid argument has a false premise
        a. the conclusion is false
        b. the conclusion is true
        c. the conclusion is true if the argument is still sound
        d. you cannot tell anything about the truth of the conclusion

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

1. The statement "If I am allowed to drive then I have a license" is false when:
        a. I am allowed to drive and have a license.
        b. I don't have a license and am allowed to drive.
        c. I don't have a license and am not allowed to drive.
        d. I am allowed to drive but don't have a license.

2. "The merchandise will be on sale only if not enough has been sold" is equivalent to which of the following?
        a. If the merchandise is on sale, then not enough has been sold.
        b. If the merchandise is on sale, then enough has been sold.
        c. Unless the merchandise is on sale, enough has been sold.
        d. Unless the merchandise is on sale, not enough has been sold.

3. The statement "The merchandise will be on sale only if not enough has been sold" is false when
        a The merchandise is on sale and enough has been sold
        b. The merchandise is on sale and not enough has been sold
        c. The merchandise is not on sale but enough has been sold
        d. The merchandise is not on sale and enough has been sold

4. Which of the following is true of the statement "Only the brave will be hired"?
        a. Being brave is a sufficient condition for being hired
        b. Being brave is a necessary condition for being hired
        c. It is logically equivalent to the statement "Unless some is brave, they will be hired."
        d. It is logically equivalent to the statement "Unless someone is hired, they are not brave."

5. The statement "Unless the Federal government shuts down, you should receive your check by Monday" is logically equivalent to which of the following
        a. If the government shuts down, you will receive your check by Monday.
        b. If the government does not shut down, you should receive you check by Monday.
        c. If the government does not shut down, you should not receive your check by Monday.
        d. Only if the govern shuts down should you receive your check by Monday.

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)

1. If Juan is a physics student he learned calculus. Juan learned calculus. So, Juan is a physics student.

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

    e. Valid   f. Invalid

2. If it is sunny, class will be outdoors. But it is not sunny. Therefore, class will not be outdoors.

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

    e. Valid   f. Invalid

3. If UCSD were not in California, surfing wouldn't be a favorite activity. But it is a favorite activity. Thus, UCSD is in California.

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

    e. Valid   f. Invalid

4. The price of meat will not be going down because we are exporting more and if we don't export more, the price of meat would be going down.

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

    e. Valid   f. Invalid

5. The bus will be late. We know this because it is raining, and if it is raining, the bus will be late.

    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. (15 points)

Consider the following hypothesis, prediction, and argument:

Hypothesis: Human beings are the product of evolution.
Prediction: The human visual system does not have a blind spot.
Argument:

If human beings are the product of evolution, then the human visual system does not have a blind spot.
The human visual system does contain a blind spot.
Therefore, human beings are not the product of evolution.

For each of the following strategies, explain why it either is or is not a good strategy for challenging the argument and identify which is the best to use

Strategy #1: Challenge the validity of the argument
Strategy #2: Challenge the claim that the human visual system contains a blind spot
Strategy #3: Challenge the first premise

II. Observation

A. Observation, Categorization, and Taxonomy: Answer the following questions about observation, categorization, and taxonomy in a short paragraph. (15 points)

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

2. Most native Japanese speakers who have grown up in Japan cannot distinguish between the "l" sound and the "r" sound. How might the fact that neither sound appears in Japanese explain this fact? How, nonetheless, might your roommate, a native Japanese speaker who grew up in Japan *appear* to distinguish perfectly between these letters in words you use in conversation with her?

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?

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)

1. 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

2. 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

3. 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

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. 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 multiple-choice questions. (20 points)

1. 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

2. 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

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

4. 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

5. 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

6. 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%

7. 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 for each moment which behavior the marmot was exhibiting.

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

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

10. 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
      b. with 95% 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 12 and 20 minutes