Assignment

Introduction to Logic: PHI142

August 26, 2014

Weightage: 10 %
All Questions carry equal(five) Marks.

1. What is *Logic*? Is it beneficial for you to think in a logically consistent [1] manner? [200 words]

2. *What if* when . . . the basic laws of logic such as below are not available to us? [200 words]

   (a) Law of Identity: A is A

   (b) Law of excluded middle: A or not A.

   (c) Law of Non contradiction: A and not A both doesn't follow.

3. Why Symbols are important in the domain of mathematics and in the growth of scientific knowledge?[200 words]

4. Is communication effective without the logical connectives such as *or, and, implies, not, if and only if*? [200 words]

5. Why we treat mathematical truths as certain? Why in logic we emphasize on "tautologies" [2] rather than contradictions? [200 words]

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[1](Consistency) an attribute of a logical system that is so constituted that none of the propositions deducible from the axioms contradict one another 4. [n] - a harmonious uniformity or agreement among things or parts

[2]Tautology: a statement that is necessarily true (like 2+2=4)

6. **what is wrong with the following argument?** The more you study, the more you learn. The more you learn, the more you know. The more you know, the more you forget. The more you forget, the less you know. The less you know, the less you learn. So, why study?

7. Analyze the following argument:

   - God is All Powerful, omnipotent and omniscient.
   - If God can do anything, can He create something that even He can't affect? (ie: A stone so heavy that He can't lift it)
   - God can do anything that is Possible.
   - Even God can't do something that is not possible to be done
   - **Question:** Can God create a stone so heavy that even He can not lift it?

8. In a harsh totalitarian country an innocent person is arrested on Sunday evening and summarily condemned to execution, which they are told will take place on one of the following five mornings. To make matters worse, they are told that they will not know the day before which morning it will be. After several hours torment the prisoner fails into a peaceful sleep as they realize that such a threat cannot be carried out. They reasoned thus:

   The execution cannot take place on Friday morning; for if they are still alive on Thursday night then the execution must take place on Friday. But they were told that they would not know the day before which day it would be. So it cannot be Friday, and so Friday can be counted out as a possibility. But by the same reasoning it cannot be Thursday either. For if they are still alive on Wednesday night then the execution must take place on Thursday. But they were told that they would not know the day before which day it would be. So it cannot be Thursday, and so Thursday can be counted out as a possibility. But by the same reasoning it cannot be Wednesday either.......The same reasoning covers Wednesday, Tuesday and Monday and so the prisoner can have a sound nights sleep.

   The prisoner is, however, greatly surprised to find themselves facing the executioner on Wednesday (or indeed any other) morning. What went wrong with the prisoner's reasoning?
   Write down the steps clearly and show how paradox [3] arises in the above situation?

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[3]Paradox: An apparently sound argument leading to a contradiction. Some famous

9. There is a truth teller (always tells the truth), a liar (always lies), and one (Spy) that sometimes answers truthfully and sometimes lies. Each man knows who is who. You may ask three yes or no question to determine who is who. Each time you ask a question, it must only be directed to one of the men (of your choice). You may ask the same question more than once, but of course it will count towards your total. What are your questions and to whom will you ask them? Justify your answer.

10. Which model of argumentation (Traditional Model or Toulmin's model) you support when we are concerned with the day to day argumetation? Justify your answer with an example.[4]

Deadline: 3 October 2014.

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examples are Russell's paradox and the liar paradox. Most paradoxes stem from some kind of self-reference

[4]Traditional model has only premises and conclusion, whereas toulmin's model has additional features such as rebuttals, exceptions, qualifiers etc