Introduction to Logical Reasoning

Problem Set #12

Although I strongly suggest that you write out answers to all these problems, *you do not have to turn in any written responses*. You do, however, need to be prepared to do these types of problems, for *questions on the weekly quizzes and exams will primarily be drawn from the problem sets*. The solutions to these problems will be provided, so you can check your own work and seek help from me as necessary.

We will devote considerable time to these problems during the next in-class workshop. In order to make that workshop productive, please make a solid start on them. That way we can use the workshop to look at the problems that presented the most difficulties.

If you do the Extra Credit Logic Puzzle, you must turn in your *type-written* solution at the *beginning* (i.e., within the first ten minutes) of class on Sunday, April 10th.

Part A Instructions

If "All socialists are pacifists" is true, what may be inferred about the truth or falsehood of the following statements? That is, which could be known to be true, which known to be false, and which would be undetermined?

Part A Problems

1. Some non-pacifists are not non-socialists.
2. No socialists are non-pacifists.
3. All non-socialists are non-pacifists.
4. No non-pacifists are socialists.
5. No non-socialists are non-pacifists.
6. All non-pacifists are non-socialists.
7. No pacifists are non-socialists.
8. Some socialists are not pacifists.
9. All pacifists are socialists.
10. Some non-pacifists are socialists.

Part B Instructions

If "No scientists are philosophers" is true, what may be inferred about the truth or falsehood of the following statements? That is, which could be known to be true, which known to be false, and which would be undetermined?

Part B Problems

1. No non-philosophers are scientists.
2. Some non-philosophers are not non-scientists.
3. All non-scientists are nonphilosophers.
4. No scientists are non-philosophers.
5. No non-scientists are non-philosophers.
6. All philosophers are scientists.
7. Some non-philosophers are scientists.
8. All non-philosophers are non-scientists.
9. Some scientists are not philosophers.
10. No philosophers are non-scientists.

Part C Instructions

If "Some saints are martyrs" is true, what may be inferred about the truth or falsehood of the following statements? That is, which could be known to be true, which known to be false, and which would be undetermined?

Part C Problems

1. All saints are martyrs.
2. All saints are non-martyrs.
3. Some martyrs are saints.
4. No saints are martyrs.
5. All martyrs are non-saints.
6. Some non-martyrs are saints.
7. Some saints are not non-martyrs.
8. No martyrs are saints.
9. Some non-saints are martyrs.
10. Some martyrs are non-saints.
11. Some saints are not martyrs.
12. Some martyrs are not saints.
13. No saints are non-martyrs.
14. No non-saints are martyrs.
15. Some martyrs are not non-saints.

Part D Instructions

If "Some merchants are not pirates" is true, what may be inferred about the truth or falsehood of the following statements? That is, which could be known to be true, which known to be false, and which would be undetermined?

Part D Problems

1. No pirates are merchants.
2. No merchants are non-pirates.
3. Some merchants are non-pirates.
4. All non-merchants are pirates.
5. Some nonmerchants are non-pirates.
6. All merchants are pirates.
7. No non-merchants are pirates.
8. No pirates are non-merchants.
9. All non-pirates are non-merchants.
10. Some non-pirates are not non-merchants.
11. Some non-pirates are merchants.
12. No non-pirates are merchants.
13. Some pirates are merchants.
14. No merchants are non-pirates.
15. No merchants are pirates.

Problem Set #12

Parts E and F Instructions

Each of the following problems presents an argument involving three categorical statements. For each of these arguments: (i) identify the major term (*P*), the minor term (*S*), and the middle term (*M*); (ii) put the argument into standard symbolic form; and (iii) use a Venn diagram to determine whether the argument is valid or not.

Part E Problems

Do the arguments in Exercise 7.6 on page 277 from *The Power of Critical Thinking* by Lewis Vaughn.

Part F Problems

Do the arguments in Exercise 7.8 on pages 277–278 from *The Power of Critical Thinking* by Lewis Vaughn.

Note: There may a lot of exercises here. Do not feel obligated to do all of them. I often assign many exercises so that you have plenty of opportunities to practice the skills these exercises are trying to impart. I suggest doing just enough of them so that you are confident that you could use these skills on a quiz or an exam.

Extra Credit Logic Puzzle (Hard)

A father said to his daughter, "I have here a one-riyal bill and a five-hundred-riyal bill. You make a statement to me. If this statement is true, I'll give you one and only one of these bills, but if your statement is false, I'll give you nothing".

Question: What statement could the daughter say to her father to ensure that she gets the five-hundred-riyal bill?

To receive any credit you must justify your answer with a logical argument showing why you are 100% right. That is to say, this question has a definitive answer that can be justified without *any* guessing on your part.