Chapter 1 Why Study Logic? Answers and Comments

WARNING! YOU SHOULD NOT LOOK AT THE ANSWERS UNTIL YOU HAVE SUPPLIED YOUR OWN ANSWERS TO THE EXERCISES FIRST.

Answers:

I. True and False

1. False.

2. True.

3. False. Remember that a computer, when functioning properly, is essentially a validity machine; if the information or input it is given is true, it will give back true conclusions. So, if any of the information put into the computer by fallible human beings is false, the conclusion could be false. It is important for you to understand that computers are simply human constructed machines, and technology should not be made into a religion.

4. False. Invalid arguments can also have true premises and a true conclusion.

5. False. Although valid arguments are the good guys, valid arguments can also have all false premises and a false conclusion. Remember the computer example. A computer is a valid machine, but humans can put false information in for premises. From false credit data a computer could reason validly to a false credit score. Also review the “south of” example in C1.

6. True. This item would be false if the qualification, "if the information he is given is true," was not included.

7. True. Important. Why valid arguments allow us to test premises. In a valid argument, if the conclusion is false, at least we still learn something. One of the premises is false. If I know my credit score is wrong and assume that the computer made no mistake in calculating it, then I know that something is wrong with the information used as premises.

8. False. A key difference with valid arguments. Invalid arguments do not allow us to test anything. If the conclusion of an invalid argument is false, the premises could be true or false. We learn nothing from invalid reasoning. We do not know if the conclusion is true, even if the premises are true, and we know nothing about the premises if the conclusion is false.

9. False. It would be nice if we knew this; invalid arguments then would be useful to some extent. The problem with invalid arguments is that we know nothing about
their conclusions, even if their premises are all true.

10. False. The conclusion of any valid argument can be false, if any of the premises are false. Experts disagree and premises used in good reasoning can be false.

11. False. Invalid arguments can have true conclusions. We would probably all be dead if the situation was otherwise, if illogical reasoning would always produce a false conclusion. We can reason invalidly and be lucky, but best to limit our reliance on chance.

12. True. But a sound argument is the ideal case. Although I argue throughout the textbook that some ideas are more reasonable than others, it will probably never be possible to get everyone in the world to agree on the truth of any given set of premises. But clearly we want the most reliable information possible and we want to use the best reasoning possible to put this information to work coming to logical conclusions. In the computer example, I want the information about my credit worthiness to be true and I want a computer to compute the most accurate credit score based on that information.

13. False. See arguments the abortion arguments (1-3 and 1-4) in the textbook. Two people may reason validly but offer conflicting conclusions. They, of course, would also have to disagree over the premises.

14. True. It is important to counter the common usage of 'valid,' that there are such things as valid beliefs, which leads to students talking about valid premises. We don’t use phrases such as "true arguments" and "valid premises." Statements or propositions are true or false. Deductive arguments are valid or invalid. Arguments are made up of statements. The statements can be true or false. The entire set of statements that involves premises and a conclusion is valid or invalid.

15. False. Logic as a discipline emerged out of the ancient Greek culture. The same culture that first developed democracy as a form of government. The Greeks realized a commitment to free debate to test for the best ideas works best when people are not fooled by illogical rhetorical tricks, when the most people exercised critical thinking and were able to separate good reasoning from bad reasoning. The cognitive values supported by the discipline of logic are part of our Greek Western heritage. Critical thinking and the belief that it is good to test beliefs are based on democratic values. There is nothing wrong with admitting that the testing of beliefs as good is a value judgment, as long as one realizes that one can argue that some values are better than others.

II.

1. The phrase "up to 30% OFF" is, of course, vague. It could mean anything from 0% to 30%. But what do we do with the phrase "between 10 and 30%"? Does this commit Shelley cars to having more than one car on sale? In other words, if
this claim is true, would there be some cars below 10% off and some above, the latter being between 10 and 30% off? Yes and No. A car that is 0% off is below 10% off. So, if we grant that a car that is 30% off is between 10 and 30% off, then a single car that is 30% off would fit the minimum claim. However, the addition of the phrase "most popular" to the "between" phrase would seem to imply that at least several cars actually have to be between 10 and 30% off. It does seem to commit the advertisers to having several cars on sale, because we can't claim that they are allowing for the possibility that most popular cars are 0% off because they must be between 10 and 30% off. Keep in mind, however, that if all the "popular" cars but one are only 10% off (only one being 30%), then they have fulfilled their commitment. Who decides what 'popular' means?

What is most vague about this claim is what price is the 10 to 30% off from? If the 10 to 30% represents a percentage off the full list price, then the sale price is likely to be higher than the suggested retail price. For instance, using one example given in the text if the full list price is $21,829, then all the cars on sale but one can be about $19,600 (10% off), almost four thousand dollars higher than the suggested retail price ($15,645) which already includes a profit. Only one car would need to be the full 30% off ($14,700) and below the suggested retail price. How would you feel if you bought a car that was allegedly 10% off but gave the retailer $4,000 in extra profit!

2. The phrase "first-class treatment" is vague. It could refer to first-class airfare or the way people are treated in general on American Airlines given the amount of money they pay. Either way, the "no one can beat" phrase implies that no one is better and hence does not claim that American is the best. So this ad does not claim that American has the best prices for first-class airfare or that it treats people better than any other airline. It only claims minimally that no one is better, that American is at least as good as any other airline.

3. Nice advertising jingle, but says nothing. It only claims that no diner is better (on what?) than Big City. It does not claim the food, service, or prices are better than its competition. Only that Big City is at least the same.

4. So Aleve is as good as generic aspirin or another competitive nonsteroidal anti-inflammatory drug (NSAID), such as Advil or Motrin, presumably for inflammation and pain.

5. The phrase "one of the highest ratings" is, of course, vague. It could mean many things. There are different rate structures and categories for hotels. What hotels does Johnsons compete with? Did Johnsons score higher in customer satisfaction than their competitors? We don't know. Minimally, all we know is that some sort of customer satisfaction survey was conducted and Johnsons scored in a category that was higher than some hotels rated in a lower category. But this does not tell us that Johnsons did better than its main competitors. Like the Dunlop example in the text, Johnsons could have scored enough satisfaction points to be placed in a general
category of excellent -- or even above average for that matter, because the claim is "one of the highest ratings," not necessarily the top general category. But this does not tell us much about their competition. Johnsons could have been rated at the bottom of an above average category, with all of their competitors rated higher, and they would still be able to claim that they received "one of" the highest ratings.

6. Again, saying up to 30% to 50% off does not add anything to a straightforward "up to 50% off." If an item is 50% off, then it is at least 30% off. So the ad does not commit JC Penney to having some items at 30% off and some at 50% off. Minimally, all JC Penney would need to do is have one item 50% off for the advertisement to be true. The main problem again is that the fine print raises the question of what were the original prices. Regular prices, which we are told are offering prices, may already be inflated prices. Then we are told that the sales may not have been taken off the regular prices. This means that a price off a particular item could be taken from an even more inflated price or a lower one than the regular price. The next sentence, however, would seem to contradict this. It says that all percentages off relate to regular prices. The only way to avoid a contradiction here is to assume that some items are on sale, but they are not percentages off from the regular prices. Instead they are, as the next sentence tells us, intermediate markdowns from some other original price.

If we use the car example in the text for guidance, probably what they are telling us is this: At least one item is 50% off its regular price, the regular price being something like the suggested retail price in car selling; but there are also sales on items for which they could charge originally even more than the suggested retail price, but they are not, because they have taken an intermediate markdown on those items. So, minimally we know that at least one item in the store is a very good deal compared to what it was originally selling for. Again, the point to be made here is not that they would actually do this, but that the language of the advertisement gives JC Penney maximum flexibility to have an alleged sale, but do just about anything they want with the prices.

Note: I once saw a beautiful shirt at a store, but it was $80. I told my self that I was not going to buy a shirt for that price that would probably fade after a few washings. Then a week later I saw a 50% off advertisement for this store. I went to the store and there was the same shirt for $60! I asked a sales lady why the shirt was not $40. She shrugged and showed me the fine print ad above. What happened?

7. Three thousand dollars off from what price? Probably the full-list price that no one in his or her right mind would pay. Not likely to be $3,000 off from the Suggested Retail Price (the Monroney price). Chances are that whatever price one ends up getting for a new car it would be the same price with out without the junk trade-in.

8. First the “up to” trick again, so could be any price from 0 to 70% off. Plus, numerous drugs are listed. It is not clear and it is not likely that the so-called
reduction applies to all of them. Finally, up to 70% off from what? Average prices you would pay at a hospital pharmacy? From what this company usually charges?

III. Valid or Invalid. In writing out these answers you should be thorough and follow the format. After stating whether the argument is valid or invalid, you should have supplied the technical definition consistent with your answer. Then you should have made a case that the particular argument under review fits this definition. In other words, you should have described a scenario that shows that it is not possible for the premises to be true, and the conclusion false, if the argument is valid, or that it is possible, if the argument is invalid. Then you should have answered the supplementary question(s). So, the basic format is: Valid or Invalid. Definition. What are the premises saying (to make a case for valid); what are they not saying (to make a case for invalid). Answer the follow up question. Numbers 4, 6, and 12 are the hardest.

1. Invalid. See textbook.

2. Invalid. This argument allows for true premises and a false conclusion. Premise #1 says nothing about people who are not on the football team. It says that to be on the team, having short hair is a necessary condition, but it is not saying that everyone in the school that has short hair is on this football team. So, if Greg is not on the football team, we know nothing about the length of his hair. Even if both premises are true, we know nothing about the conclusion; it could be true or false.

3. Valid. It is not possible for the premises to be true and the conclusion false. If it is true that every crime against nature is immoral and ought to be prohibited, and true that homosexuality is one of those crimes, then homosexuality is immoral and ought to be prohibited. If someone believed the conclusion to be false, then this person would need to disagree with at least one of the premises, but not necessarily all of them. Because if the conclusion of a valid argument is false, then at least one of the premises is false. Notice that no matter how discriminatory and lame this argument is for many people today, it is valid. The issue with someone arguing this way would be over the content. What is the evidence the gay life style is a crime against nature?

4. Invalid. This argument allows for true premises and a false conclusion. The first premise is not claiming that all Chinese are nuclear weapons spies for the Chinese government. Here we see that all A’s are B’s is not the same as all B’s are A’s. There could be many people of Chinese ancestry that are not Chinese nuclear weapons spies, even if it is true that all nuclear weapons spies for the Chinese government are indeed Chinese. So, even if Wen Ho Lee is Chinese, we would know nothing about the conclusion; it could be true or false. Also, because this argument is invalid, if the conclusion is false, we know nothing about the premises. They could be both true. One or more could be, but they both do not need to be
false.

5. Valid. It is not possible for this argument to have true premises and a false conclusion. Premise #1 is saying essentially that everything in the universe that is black is a crow. So, if we are confronted with a black item of any kind, it would be a crow. False, of course, but irrelevant for judging the reasoning trail. If we find that the conclusion is false, this would not change the assessment of the reasoning trail; it is still valid. However, we would know that at least one of the premises is false. Since the second premise is known to be true, we would be testing the first premise and now know that it is false. The supplementary question, "How would this affect the validity of this argument?" is intended to determine if you thoroughly understand that the validity of the argument does not depend on the actual content. Too many students will say that if we find any false content, then the argument is invalid. Wrong, wrong, wrong. Logic is more complicated and interesting than this misconception implies.

6. Valid. It is not possible for this argument to have true premises and a false conclusion. If true, premise #1 eliminates any possibility of a U. S. manufactured car having factory installed seat belts prior to 1970. If John has a car that was built prior to 1970, 1969 according to premise #2, then his car was not equipped with seat belts at the factory. If the premises of this argument are true, then the conclusion is true. However, John's girl friend should not be convinced that John is telling the truth about his 1969 car not being equipped with seat belts at the factory. To know that his conclusion is true, she must know that all his premises are true. If she finds out that it is true that all U. S. manufactured cars built from 1970 on had safety belts installed at the factory, it does not follow that the first premise is true. Some car manufacturers could have had safety belts installed at the factory in their more expensive cars prior to the mandate from Congress. Just because every car after 1970 had to have the belts does not mean that every car prior to 1970 did not.

7. Valid. See textbook.

8. Invalid. It is possible for this argument to have true premises and a false conclusion. The first premise states that if Reagan lied about the Contra money, then he would lie about the Iran deal, but it is not saying that if he lied about Iran, then we would be guaranteed in knowing that he lied about the Contra deal. In other words, even if we grant that if Reagan knew about the Contra deal, he would have to know where the money came from -- thus knowing about the Iran deal -- it does not follow, as Reagan himself claimed, that just because he knew about Iran, he also knew about the Contra situation. According to Reagan, his interest at the time was getting our hostages released from Lebanon. So, he knew and approved of dealing with Iran as an avenue to achieving the hostage's release, but did not know or approve what his staff did with the money from the Iranian arms deal. Even if the premises are true, the conclusion could be false. Knowing that the second premise is true tells us nothing about the conclusion. Even if we
accepted both premises as true, we would know nothing about the conclusion
because the argument is invalid.

9. Invalid. It is possible for the premise to be true and the conclusion false. When a
history teacher tells her class that it is necessary for each student to pass the final
in order to pass the course, she is not saying that this is sufficient -- that it is all
they have to do. There may be attendance requirements, quizzes, and other major
exams that are part of the course. To assert that the final exam is very important
does not mean that passing it is all there is to passing the course. Thus, it would
be possible for a student to pass the final and not pass the course, and the history
teacher being true to her word.

10. Valid. It is not possible for the premises to be true and the conclusion false. If
Virginia makes Betty come to the party as the first premise states, and Betty
makes Delia come as the second premise states, then if Virginia comes, Delia will
also come. This conclusion would be true, if the chain reaction asserted in the
premises is true. If the conclusion is false, then we can infer something about the
premises; we would know that at least one is false.

11. Invalid. It is possible for this argument to have true premises and a false
conclusion. The second premise is not saying that if Sam attends, then Ken will
attend. Rather, it is essentially saying that if Ken attends, then Sam will. So,
combined with the first premise we have the attendance of Virginia or Ken or
both causing Sam's attendance. From this it would not follow though that
Virginia's attendance will cause Ken's attendance. If Virginia attends, but Ken
does not, then the conclusion would be false. But this would tell us nothing about
the premises, because the argument is invalid. So even if we find out that the
second premise is true, we would not be testing the first premise. It still could be
true or false.

12. Valid. It is not possible for this argument to have all true premises and a false
conclusion. If every single liberal Democrat opposes GATT as the first premise
states, and Clinton does not oppose it as the second premise states, then it is not
true that he is a liberal Democrat. Thus, if the premises are true, then the
conclusion is true.

13. Invalid. It is possible for the premises of this argument to be true and the
conclusion false. The first premise makes a claim about all liberal Democrats --
they oppose GATT. It does not claim that they are the only group to oppose
GATT. The first premise leaves open the possibility that someone could not be a
liberal Democrat but still oppose GATT. We cannot infer from the fact that
someone is not a liberal Democrat that he or she is also not opposed to GATT. So
if Clinton is not a liberal Democrat, from this alone we would not know his
position on GATT. The conclusion could be true or false, even if the premises are
all true. This argument differs from #12 because in #12 we know that Clinton
does not oppose something that all liberal Democrats oppose, so he can't be one of
them. In this argument we are not locked into the conclusion in the same way. Even if all liberal Democrats oppose something, from this alone we don't know what other groups oppose or do not oppose. Even if the premises are true, we know nothing about the conclusion; it could be true or false.

14. Invalid. It is possible for this argument to have all true premises and a false conclusion. If stopping inflation is a necessary condition for solving our domestic problems, and avoiding wars is necessary for stopping inflation, then it would follow that avoiding wars is necessary for the solution of our domestic problems. But the conclusion says that if we avoid wars, we will be guaranteed of solving our domestic problems. This conclusion does not follow, because the premises leave open the possibility that, although avoiding wars is important for avoiding domestic and economic problems, there are other things we must do as well. So if economists dispute the conclusion of this argument, they would not necessarily dispute one or both of the premises. Because the argument is invalid, one can dispute the conclusion and consistently hold the premises to be true.

15. Invalid. It is possible for this argument to have all true premises and a false conclusion. The first premise notes that it is necessary that a majority of the Congress supports President Bush's assessment of the danger of Iraq supplying terrorists with weapons of mass destruction, but it does not say their support is sufficient. So, even if a majority of the Congress supports President Bush's assessment of the danger of Iraq supplying terrorists with weapons of mass destruction, attacking Iraq is not guaranteed. So, even if the premises are true, the conclusion could be true or false; we would know nothing about the conclusion even if the premises are true.

16. Invalid. It is possible for this argument to have all true premises and a false conclusion. The first premise does not say that only expensive cars are fast, or that all fast cars are expensive. So, if Ezra has a fast car, we do not know if his car is expensive or not. Since this argument is invalid, if we find out the conclusion is false, we know nothing about the premises and they could be all true. Invalid arguments allow for all possibilities.

17. Valid. It is not possible for the premises to be true and the conclusion false. The first premise essentially says that all those in favor of Obama’s health care plan were liberal democrats. So, if Boehner was not a liberal democrat, he was not in favor of the plan. Knowing that the second premise and the conclusion are true, has no bearing on whether the argument is valid or invalid. If these premises are true, the conclusion is true. If the conclusion if false, then one of the premises must be false. But if the conclusion and the second premise are true, the first premise can still be true or false.

18. Invalid. It is possible for this argument to have all true premises and a false conclusion. Now the first premise does not say “only liberal democrats,” so others that were not liberal democrats might also have supported Obama’s plan.
So merely knowing that Boehner was not a liberal democrat tells us nothing about whether he was or was not in favor of the plan. Again, knowing that the second premise and the conclusion are true, has no bearing on whether the argument is valid or invalid. If these premises are true, the conclusion could be false. If the conclusion and the second premise are true, the first premise can still be true or false. Trick questions? Not really. Important. We do not judge arguments to be valid or invalid by their truth content. We judge the reasoning. IF the premises are true, are we locked into the conclusion? If no, invalid. If yes, valid.

19. Invalid. It is possible for this argument to have all true premises and a false conclusion. The first premise says nothing about people who do not smoke and how long they will live as a consequence. It does imply that anyone who lives to be 100 will be a non-smoker, but there is no statement that being a non-smoker will guarantee being a person living to 100. So, if Janell does not smoke, we do not know if the conclusion is true. Since this argument is invalid, even if the premises are true, the conclusion can be true or false.

20. Valid. It is not possible for the premises to be true and the conclusion false. If all roses are indeed red, then any rose I have in my hand will be red. Of course we know that all roses are not red and the first premise is false. But having false premises does not imply a valid argument. The reasoning is a different issue. So the argument is valid, but not sound. A false premise does not “turn a valid argument into invalid” as some students often conclude.