SOLUTIONS TO SELECTED EXERCISES

CHAPTER ONE

Section 1.3E

1.a. This sentence does have a truth-value and does fall within the scope of this text. It is false if by 'second President of the United States' we mean the second person to hold the office of President as established by the Constitution of the United States. However, it is true if we mean the second person to bear the title 'President of the United States', as the Articles of Confederation, which predate the Constitution, established a loose union of states whose first and only president, John Hanson, did bear the title 'President of the United States.

c. This is a request or command, as such it is neither true nor false, and therefore does not fall within the scope of this text.

e. This sentence does have a truth-value (it is true), and does fall within the scope of this text.

g. This sentence does have a truth-value and does fall within the scope of this text. It is false, as Bill Clinton is the President who immediately preceded George W. Bush.

i. This sentence is neither true nor false, for if it were true, then sentence m would be true, and if m is true then what it says, that m is false, is also true. And no sentence can be both true and false. See the answer to exercise m below.

k. This sentence gives advice and is neither true nor false. Hence it does not fall within the scope of this text.

m. This appears to be a straightforward, unproblematic claim. But it is not. In fact, it embodies a well-known paradox. For if what the sentence says is true, then the sentence itself is, as is claimed, false. And if what the sentence says is false, then the sentence is not false and therefore is true. So the sentence is true if and only if it is false, an impossibility. This is an example of the paradox of self-reference. We exclude paradoxical sentences from the scope of this text.

2.a. When Mike, Sharon, Sandy, and Vicky are all out of the office no important decisions get made.

Mike is off skiing.

Sharon is in Spokane.

Vicky is in Olympia and Sandy is in Seattle.

No decisions will be made today.

c. This passage does not express any obvious argument. It is best construed as a series of related claims about the people in the office in question.

e. This passage does not express any obvious argument. It is best construed as a series of related claims about the contents of a set of drawers.

g. This passage does not express an obvious argument, though it might be claimed that the last sentence, 'So why are you unhappy' is rhetorical and has here the force of 'So you should be happy', yielding the following argument:

The weather is perfect; the view is wonderful; and we're on vacation.

You should be happy.

i. Wood boats are beautiful but they require too much maintenance.

Fiberglass boats require far less maintenance, but they tend to be more floating bathtubs than real sailing craft.

Steel boats are hard to find, and concrete boats never caught on.

So there's no boat that will please me.

k. Everyone from anywhere who's anyone knows Barrett.

All those who know Barrett respect her and like her.

Friedman is from Minneapolis and Barrett is from Duluth.

Friedman doesn't like anyone from Duluth.

Either Friedman is a nobody or Minneapolis is a nowhere.

m. Whatever is required by something that is good is itself a good.

Being cured of cancer is a good.

Being cured of cancer requires having cancer.

Having cancer is a good.

o. When there are more than two political parties, support tends to split among the parties with no one party receiving the support of a majority of voters.

No party can govern effectively without majority support.

When there is only one political party, dissenting views are neither presented nor contested.

When there are two or more viable parties, dissenting views are presented and contested.

Only the two party system is compatible both with effective governance and with the presenting and contesting of dissenting views.

Section 1.4E

1.a. False. Many valid arguments have one or more false premise. Here is an example with two false premises:

All Doberman pinschers are friendly creatures.

All friendly creatures are dogs.

All Doberman pinschers are dogs.

c. True. By definition, a sound argument is a valid argument with true premises.

e. False. A valid argument all of whose premises are true cannot have a false conclusion. But if a valid argument has at least one false premises, it may well have a false conclusion. Here is an example:

Reptiles are mammals.

If reptiles are mammals, then reptiles are warm blooded.

Reptiles are warm blooded.

g. False. An argument may have true premises and a true conclusion and not be valid. Here is an example:

> Chicago is in Illinois.
> _____
> Madrid is in Spain.

i. False. A sound argument is, by definition, a valid argument with true premises. And every valid argument with true premises has a true conclusion.

Section 1.5E

1.a. This passage is best construed as a deductive argument with some unexpressed or assumed premises. These premises include: Mike is skiing somewhere other than the office. No one can be in Spokane, or Olympia, or Seattle and in the office in question. With these premises added, the argument is deductively valid. Without them, it is deductively invalid.

c. As noted in the answers to exercises **1.3.2E**, the passage in question expresses no plausible argument. Construed as a deductive argument it is deductively invalid (no matter which claim is taken as the conclusion). Construed as an inductive argument it is inductively weak, again no matter which claim is taken as the conclusion.

e. Same answer as c. above.

g. This passage can be construed as an argument (see answers to **1.3.2.E**). So construed it is deductively invalid but inductively plausible.

i. This passage can be construed as a deductive argument with suppressed or assumed premises. The missing premises can be expressed as: 'All the boats there are either wood or fiberglass or steel or concrete', and 'No boat will please me if it requires too much maintenance, is a floating bathtub, is hard to find, or is of a type that never taught on.' Even with these premises added the argument is deductively invalid, as it does not follow from the claim that fiberglass boats "tend to be floating bathtubs" that every fiberglass is a floating bathtub.

k. This argument is best construed as a deductive argument, and is deductively valid. Since Barrett is from Duluth, and Friedman doesn't like anyone from Duluth, Friedman doesn't like Barrett. Hence, by the first premise, either the place Friedman is from (Minneapolis) is a nowhere, or Friedman isn't anyone, i.e., is a nobody.

m. This is a valid deductive argument. The conclusion is, of course, false. So we know that a least one of the premises is false. The best candidate for this position is "Whatever is required by something that is good is itself a good".

o. This passage is best construed as a deductive argument. From the first and second premises it follows that effective governance is not possible when there are more than two political parties. From the third and the fourth premises it follows that there must be at least two political parties for dissenting

views to be presented and contested. Whether the argument is deductively valid depends on how we construe the claim 'Only the two-party system is compatible both with effective governance and with the presenting and contesting of dissenting views.' It is invalid if we take this claim to mean that the two-party system is compatible both with effective governance and with the presenting and contesting of dissenting views. The argument is valid if we take the claim in question to mean only that all systems other than the two-party systems are not so compatible.

Section 1.6E

1.a. {Kansas City is in Missouri, St. Paul is in Minnesota, San Francisco is in California}

c. There is no such set. If all the members of a set are true, then it is clearly possible for all those members to be true, and the set is therefore consistent.

2.a. All the members of this set are true (The Dodgers have not been in Brooklyn for almost half a century. Here, in the Northwest, good vegetables are hard to find. And today, the day this answer is written, is hotter than yesterday.) Since all the members are true, it is clearly possible for all the members to be true. Therefore, the set is consistent.

c. All three members of this set are true, so the set is consistent.

e. It is possible for all four members of this set to be true. Imagine yourself driving home on a Monday afternoon with a nearly empty gas tank.

g. The set is inconsistent. If no one who fails "Poetry for Scientists" is bright and Tom failed that course, it follows that Tom is not bright. So, for every member of the set to be true Tom would have to both be bright (as "Tom, Sue, and Robin are all bright' alleges), and not be bright. This is not possible.

i. This set is inconsistent. If Kennedy was the best President we ever had, it cannot be that Eisenhower was a better President than Kennedy, and vice-versa. So not all the members of the set can be true.

k. This set is consistent. What is being claimed is that everyone who likes film classics likes *Casablanca,* not that everyone who likes *Casablanca* likes all film classics. So, it is possible for Sarah to like *Casablanca* without liking (all) film classics. Similarly, Sarah can like *Casablanca* without liking Humphrey Bogart.

3.a. 'Que será, será' is a logically true sentence (of Spanish). It means 'Whatever will be, will be.' This sentence, taken literally, is logically true. (Were it not, there would have to be something that will be and will not be, an impossibility.)

c. 'Eisenhower preceded Kennedy as President' is true and is logically indeterminate. It is true because of facts about the American political system and how the voters voted in 1956 and 1960, not because of any principles of logic.

4.a. Logically indeterminate. Passing the bar exam does not involve, as a matter of logic, having gone to law school. Lincoln passed the bar examination but never went to law school.

c. Logically false. An MD is a Doctor of Medicine, so every MD is a doctor.

e. Logically true. Whoever Robin is and whatever the class is, she either will, or will not, make it to the class by starting time.

g. Logically false. If Bob knows everyone in the class, and Robin is in the class, it follows that he knows Robin, so if the first part of this claim is true, the last part, which claims Bob doesn't know Robin, must be false.

i. Logically true. Since ocean fish are a kind of fish, it follows from 'Sarah likes all kinds of fish' that she likes ocean fish.

k. Logically indeterminate. This claim is almost certainly true, given the very large number of people there are, but it is not a logical truth. If all but a handful of people were killed, then one of the survivors might love everyone, including him or herself, and not be lacking in discrimination.

5.a. No one will win.
There will be no winner.

c. Not possible. If one sentence is logically true and the other is logically indeterminate, then it is possible for the second sentence to be false and the former true (the former is always true), and hence the sentences are not logically equivalent.

e. Any pair of logically true sentences will satisfy this condition, for example 'A square has four sides' and 'A mother has a child (living or dead)'. Neither sentence can be false, so it is impossible that one is true and the other false.

6.a. These sentences are not logically equivalent. It can, and does, happen that a person loves someone who does not return that love.

c. These sentences are not logically equivalent. What one claims to be the case is not always actually the case. Tom may want to impress his new boss, a gourmet cook, but refuse to indulge when presented with a plate of raw shark.

e. These sentences are not logically equivalent. If the first is true, then both Bill and Mary will fail to get into law school. The second sentence makes a weaker claim, that one or the other will not get into law school. It, unlike the first sentence, will be true if Mary gets into law school but Bill does not.

g. These sentences are not logically equivalent. If the first is true, then there are no non-Mariner fans at the rally, but it does not follow that all the Mariner fans are there. And if the second is true, it does not follow that no non-Mariner fans are present.

i. These sentences are not logically equivalent. There is often a difference between what is reported and what is the case. If a strike is imminent but no newscast so reports, the second of the sentences is true but the first false. So too, newcasts, even taken collectively, often get it wrong, as when all

news outlets reported that Dewey won the presidential election in 1948 when in fact Truman won that election.

k. These sentences are not logically equivalent. If the first is true, then at least one of the two, Sarah and Anna, will not be elected, and perhaps neither will be elected. That is, this sentence will be true if neither is elected. But in that case the second sentence, which claims that one or the other will be elected, will be false.

m. These sentences are not logically equivalent. The first may well be true (each of us can probably name at least one person we dislike). Given the truth of the first sentence, the second sentence may still be false, for we may each dislike different persons, and there may be no one universally disliked person.

o. These sentences are not logically equivalent. It is plausible that each of us does like at least one person, but it does not follow that there is some-one we all like.

Section 1.7E

1.a. True. If a member of a set of sentences is logically false, then that member cannot be true, and hence it cannot be that all the members are true. So the set is logically inconsistent.

c. True. Sentences that are logically equivalent cannot have different truth-values. So if all the premises of an argument are true, and one of those premises is equivalent to the conclusion, then the conclusion must also be true. Hence, that argument cannot have true premises and a false conclusion. It is, therefore, deductively valid.

e. True. 'Whatever will be, will be' is logically true. Therefore, any argument that has it as a conclusion cannot have a false conclusion, and, hence, cannot have true premises and a false conclusion. Any such argument is, therefore, deductively valid.

g. False. An argument all of whose premises are logically true is valid if and only if its conclusion is also logically true. If the conclusion of such an argument is not logically true, then it is possible for the premises all to be true (as logical truths they are always true) and the conclusion false.

2.a. No. Such a person obviously has at least one false belief, but her or his mistake is about the facts of geography and/or of the political organiza-tion of the United States.

c. Normally logic cannot tell us whether a sentence is true or false, for most of the sentences we normally deal with, truth is a matter of how things are with the world. And, to determine whether or not a valid argument is sound, we do need to determine whether the premises are true. However, in one case logic can tell us that an argument is sound. This is where the argu-ment is valid and all the premises are logical truths.

e. If an argument has a logical falsehood as one of its premises, it is impossible for that premises to be true. If one premise cannot be true, then surely

it cannot be that all the premises are true, and it cannot be that all the premises are true and the conclusion false. So the argument must be deductively valid.

g. If an argument has a logical truth for its conclusion, it is impossible for that conclusion to be false. And if the conclusion cannot be false, then it obviously cannot be that the premises are true and the conclusion false. Hence such an argument is deductively valid, no matter what its premises are. But it will be sound only if those premises are true. So some such arguments are sound (those with true premises) and some are unsound (those with at least one false premise).

i. Yes. If the set with a million sentences is consistent, then it is possible for all of those sentences to be true. Now consider a set each of whose members is equivalent to at least one member of that first set. Sentences that are equivalent have the same truth-value. Therefore, if all the million members of the first set are true, all the sentences of the second set, each of which is equivalent to a member of the first set, will also be true. Therefore, the second set is also consistent.