

UNIT 1: REASON AND ARGUMENT

Answers to exercises

1.4 E 1

Some students will undoubtedly pass this course. Hence it is clear that some students in this class will do the exercises, since nobody passes who doesn't do at least some of the exercises.

Some students will pass this course.

Nobody passes who doesn't do at least some of the exercises.

∴ Some students in this class will do the exercises.

“Hence” indicates the conclusion & “since” indicates a premise.

1.4 E 2

Anybody who smokes is irrational. Any rational person knows that smoking can kill you, and engaging in an activity that can kill you is suicide! No rational person commits suicide.

Any rational person knows that smoking can kill you.

Engaging in an activity that can kill you is suicide.

No rational person commits suicide.

∴ Anybody who smokes is irrational.

There are no premise or conclusion indicators. But the three premises taken together supports the conclusion, whereas none of the other statements are supported by each other (or by the conclusion.)

1.4 E 3

If I study, I won't have much free time in which to party. On the other hand, if I don't study, my parents will cut off my funds. Without parental funds I'm not going to be going out much at all. So it looks like there won't be any partying for me.

If I study then I won't have much free time in which to party.

If I don't study then my parents will cut off my funds.

Without parental funds, I won't be going out much at all.

∴ I won't be partying. (There won't be any partying for me.)

“So” indicates the conclusion. “On the other hand” indicates a premise. The argument depends on an unstated premise: “Either I will study or I won't study.” Either way, the speaker won't be partying! But, this is true for all propositions/sentences in bivalent logic – they are either true or false – so it is not necessary to include such a premise in the argument.

1.4 E 4

At some point in the far distant past, the universe came into existence. But nothing can come from nothing; nothing can come into existence unless there is something to create it. Accordingly, there must be a God – a first creator, outside time. This follows from the fact that there must exist, outside the universe, some being that caused the universe to exist. Such a being must not have been created at all, unless there was some greater being that caused that creator to exist, and hence this being would be the first creator.

God is (defined as) a first creator, outside time

The universe came into existence at some point in the past.

Nothing can come into existence unless there is something to create it.

There must exist, outside the universe, some being that caused the universe to exist.

Either the creator of the universe was not created (always existed) or some greater being caused the creator to exist – which would be the first creator.

∴ There is a first creator (or God exists).

“Accordingly” indicates the conclusion. “This follows from” is a premise indicator. You may or may not want to include, as a premise, that God is understood to be a first creator, outside time. This is the definition of God that the author is using. This background information is certainly relevant to the argument (as would be the definition of any term) and so must be included with the premises rather than with the conclusion.

1.4 E 5

Some people think that Ms. Peacock murdered Mr. Green, but that is wrong! Everyone knows that Ms. Peacock could not have murdered Mr. Green unless the murder occurred in the library. Yet, there were signs of struggle and drops of blood in the dining room, indicating that the murder occurred there and not in the library where the body was found.

Ms. Peacock did not murder Mr. Green unless the murder occurred in the library.

The murder occurred in the dining room (not in the library).

(There were signs of struggle & blood in the dining room – supports Premise 2.)

∴ Ms. Peacock did not murder Mr. Green.

The conclusion is indicated by the phrase, “that is wrong!”. The paragraph supports the claim that Ms. Peacock did not murder Mr. Green. The first half of the last sentence, (there were signs of struggle and drops of blood in the dining room) is a sub-argument in support of the claim that the murder occurred in the dining room, but may be included with the premises. The facts that some people think that Ms. Peacock did it, and that the body was found in the library, are not part of the argument that Ms. Peacock didn’t do it. Rather, they appear to be part of the view which this author is refuting when making this argument (namely, that Ms. Peacock murdered Mr. Green in the library.)

1.4 E 6 I realized, as I lay in bed thinking, that we are not responsible for what we do. This is because either determinism or indeterminism must be true. If determinism is true, we cannot do other than we do. If so, we are but puppets on strings – our actions are not free. If indeterminism is true, then human actions are random, and hence not free. If our actions are not free, it must be conceded that we are not responsible for what we do.

Either determinism or indeterminism must be true.
If determinism is true then we cannot do other than we do.
If we cannot do other than we do, then we are not free.
If indeterminism is true, then human actions are random.
If human actions are random, then they are not free.
If our actions are not free, then we are not responsible for what we do.

∴ We are not responsible for what we do.

The conclusion is indicated by “I realized ...” which is then followed by the premise indicator, “this is because” showing that it is the first sentence that is being argued for. (Be careful with phrases such as I saw or I realized, for an author can also recognize the truth of premises!) ‘If so’ refers to the situation in which we cannot do other than we do (the immediately preceding situation.) Thus the third premise is a conditional, if we cannot do other than we do then we are but puppets on strings – we are not free. But, “we are but puppets on strings” is filler, and the dash shows that the author takes it to be equivalent to the claim that we are not free; thus it should be left out. The fourth and fifth premises could be presented as one: if indeterminism is true, actions are random and are not free. Likewise, the second and third could be presented as one: if determinism is true then we cannot do other than we do and we are not free.

1.4 E 7 From the way that people act, it would seem that some people desire power. It is true that all people desire what is good, and that nobody desires what is evil. So if people do desire power then it must be good. Yet, power leads to corruption and nobody can deny that corruption is evil. So power cannot be desired for its own sake. Those who think they want power are mistaken, and rarely attain what they truly desire when they act to obtain power.

All people desire what is good.
Nobody desires what is evil. (Or a single premise with all people desire the good.)
If people desire power then it is good.
Power leads to corruption.
Corruption is not good/is evil.

Nobody desires power for its own sake - those who think they want power are mistaken.

Further information/consequence of conclusion: People rarely attain what they desire when they act to obtain power.

The first sentence tells us what the author is arguing against – the appearance that people desire power. This suggests that the conclusion is the opposite: people do not desire power & those who think they do are mistaken. This is supported by the rest of the paragraph. But, a further consequence is given – people rarely attain what they truly desire when they obtain power. Yet, this final sentence (about obtaining their desires) should probably not be included as part of the conclusion since it isn't really supported by the argument (about the nature of power & desires).

You can break this argument up into subarguments.

An alternative interpretation:

People desire what is good
Nobody desires what is evil. (Sub argument for P1)

P1: If people desire power then it is good.

P2: Power leads to corruption

P3: Corruption is evil/not good.

Main Conclusion: Power cannot be desired for its own sake.

People appear to desire power.

Secondary Conclusion:

Those who think they want power are mistaken, and rarely attain what they truly desire when they act to obtain power.

In many of the answers below, I have named the fallacy committed. You are not responsible for knowing the names. But you might be interested!

1.6 E 1

All students love learning
Everyone who loves learning is responsible.
Any student who misses a class is not responsible.

∴ No student will miss a class.

Valid, but not sound. (At least one of the premises is false!) Since all students love learning, all are responsible. Since they are responsible, they don't miss classes (Premise 3) – if they missed them they wouldn't be responsible!

1.6 E 2

Hounds are dogs.
Snoopy is a dog.

∴ Snoopy is a hound.

Invalid. The conclusion does not follow from the premises – Snoopy could be some other sort of dog, for instance, a German Shepherd. (This is an example of the syllogistic fallacy of the undistributed middle term.)

1.6 E 3

Toronto is either south of Seattle or north of Ottawa.
If Toronto is north of Ottawa then Ottawa is not the capital of Canada.
Ottawa is the capital of Canada.

∴ Toronto is south of Seattle

Valid. Sound. Toronto is south of Seattle. Thus the first premise is true. The second premise is also true. Since Toronto is NOT north of Ottawa, the second premise is true! (More on this in the next few weeks, but it is similar to the case of the valid argument form that has inconsistent or contradictory premises.) Since Ottawa is the capital of Canada, it follows from the second premise that Toronto is not north of Ottawa. And since it isn't north of Ottawa, it follows from the first premise that it is south of Seattle.

1.6 E 4

Dark chocolate contains antioxidants.
Everything containing antioxidants is good for you.

∴ Dark chocolate is good for you.

Valid. But not sound. The first premise is true. The second premise is false (since something can contain both antioxidants and poison.) The conclusion is, of course, true! (At least in moderation.)

1.6 E 5

If today is Tuesday then we do not have logic class.
Today is not Tuesday.

∴ Therefore we do have logic class.

Invalid. Saturday is not Tuesday, and we do not have logic classes on Saturday. (This is an example of the fallacy of denying the antecedent.)

1.6 E 6

Toronto is the capital of Ontario.
Ottawa is the capital of Canada.

∴ At least two capital cities are in Ontario.

Strictly Invalid – the conclusion doesn't follow from these two premises, since there is no indication that Toronto and Ottawa are cities in Ontario.

Yet, in some sense it is valid. It is common knowledge that the Toronto and Ottawa are cities in Ontario, so this can be treated as an implicit premise. If it is valid, then it is also sound.

1.6 E 7

If it is possible to know that God exists, then it is possible to know that angels exist.
It is not possible to know that angels exist.

∴ It is not possible to know that God exists.

Valid. The conclusion follows logically from the premises. Is it sound? Are the premises true? We cannot determine soundness.

1.6 E 8

Tomatoes are fruits.
Tomatoes are vegetables.

∴ Either a tomato is an animal or it isn't.

Valid. The conclusion is a tautology – it is necessarily true. Whether or not it is sound is debatable. Tomatoes are botanically fruits. When it comes to cooking, it is often considered a vegetable (along with snow peas, peppers, etc.)

1.6 E 9

Only the good die young.
Kurt Cobain was good.

∴ Kurt Cobain died young.

Invalid. The first premise can be rephrased: If a person dies young, then he/she is good. It does not follow from the fact that Cobain was good that he died young. (This is an example of the fallacy of affirming the consequent.)

1.6 E 10

Only the good die young.
Courtney Love is still alive.

∴ Courtney Love is not good.

Invalid. Again, think of the premise as: If a person dies young, then he/she is good. It does not follow from the fact that Love is still alive that she is not good. (This is an example of the fallacy of denying the antecedent.)

1.6 E 11

All philosophers are professors.
All philosophers are logicians.

∴ All logicians are professors.

Invalid. This is similar to E 2. There could be logicians who are not philosophers (for instance, mathematicians). They would not necessarily be professors. (This is an example of the syllogistic fallacy of the undistributed middle term.)

1.6 E 12

Power corrupts.
Knowledge is power.

∴ Knowledge corrupts.

Invalid. The words 'power' is ambiguous. In the first sentence, it is some form of political power. In the second premise it means something else – perhaps the power of persuasion. Yet the logical form appears to be a valid one (except for the ambiguity). If knowledge is identical to power (or even if it is a type of power); then, if having power corrupts, having knowledge corrupts. Compare: Cats are mammals. Felines are cats. Therefore felines are mammals.

1.6 E 13

Nobody who received the H1N1 vaccine got the Swine Flu.
George didn't get the Swine Flu.

∴ George got the H1N1 vaccine.

Invalid. This can be considered a version of the fallacy of affirming the consequent. The first premise is equivalent to: Anyone who received the vaccine failed to get the Swine Flu. So, the first premise implies that if George received the vaccine, then he didn't get the Swine Flu. Alternatively, the first premise is also equivalent to "Anyone who got the Swine Flu failed to get the H1N1 vaccine." In that case, it is a fallacy of denying the antecedent.

1.6 E 14

On the whole, students in PHL 245 work harder than students in PHL 102.

∴ Samantha, in PHL 245, works harder than Max, in PHL 102.

Invalid. This is the fallacy of division. What is true of the whole class may not be true of individual students. Just because a property applies to the whole, it doesn't follow that it applies to the parts of a thing.

1.6 E 15

Hotel key cards are encoded with your personal and credit card information.
Items with your personal and credit card information should be destroyed when
you no longer need them in order to prevent identity fraud.

Therefore, hotel key cards should be destroyed when you no longer need them.

Valid. Unsound. The first premise is false. (An urban legend.)

1.6 E 16

Every moment in time is followed by another moment in time.
Every moment in time is preceded by another moment in time.
An infinite series is one that has no beginning or end.

∴ Time is an infinite series of moments.

Valid. Cannot determine whether it is sound. It is not clear whether either of the first two premises are true.

1.6 E 17

Atoms are colourless.
Air is made up of atoms.

∴ Air is colourless.

Invalid. (This is the fallacy of composition. Just because a property applies to the parts of a thing, it doesn't follow that it applies to the whole. Atoms are colorless, but lots of things made up of atoms do have color!) Note the similarity to the fallacy of division E14)

1.6 E 18

If God does not exist then there is no right or wrong.
God exists.

∴ There is right and wrong.

Invalid. This is similar to E 9. Even if the first premise is true, it is possible that God exists but there is no right or wrong. (This is an example of the fallacy of denying the antecedent.)

1.6 E 19

Everything that is actual is possible.
Human beings are actual.

∴ Human beings are possible.

Valid. And sound.

1.6 E 20

Tom is a barber who shaves all and only those barbers who do not shave themselves.

∴ Tom has a pet dog.

Valid. The premise is a contradiction. If it is true, then Tom neither shaves himself nor fails to shave himself. Anything follows from a contradiction! But it cannot be sound. There is no way that the premise can be true.