U.S. Customs and Border Protection

A Preparation Manual for the Intelligence Research Specialist Examination

Logical Reasoning Test
Preparation Manual

Preparing For Logical Reasoning Questions

Logical Reasoning

Reasoning is the single most important competency for successful performance in the Intelligence Research Specialist job. Correct reasoning is useful for decision-making and problem solving, activities that prevail on the job. In this part, you will read some useful information about reasoning correctly.

The questions in this examination are designed to test your ability to understand complicated written material and to derive correct conclusions from it. The kind of reading that these questions ask you to do is different from ordinary reading in which you just follow the general meaning of a series of sentences to see what the writer thinks about a topic. It is the kind of reading you have to do with complex material when you intend to take some action or draw some conclusion based on that material.

The test asks you to make logical conclusions based on facts you are given in various paragraphs. These conclusions need to be based only on the facts in the paragraph. Therefore, answering requires careful reading and focused thought about what information is given and what information is <u>not</u> given.

The following information will give you some suggestions about how to approach the questions and some information about how you can develop your reasoning skills.

Reading the Paragraph

Every reading paragraph in the test is drawn from some kind of written material relating to Intelligence Research Specialist work or Government work. There may be facts in a paragraph that do not actually apply to every part of the Federal Government or that may not always be true everywhere. In answering the questions, it is important that you **accept every fact in the paragraph as true**. Remember that you are not being judged on your knowledge of facts, but rather on your ability to read and reason on the basis of given facts.

Not all information is of the same type. There can be information about events and there can be information about groups (or categories) of things. Information can also be positive or negative. Usually, information is positive (for example, "these tire tracks are several days old"), but knowledge that something is <u>not</u> the case is also useful information (for example, "these tire tracks are <u>not</u> from a truck").

Reading the Lead-In or Basic Question

In this test, you will find a paragraph, followed by a lead-in phrase that asks you to complete a sentence by choosing one of several response options labeled from (A) to (E). The lead-in phrase may be either positive or negative:

> *"From the information given above, it can be validly concluded that"*

<div align="center">or</div>

> *"From the information given above, it CANNOT be validly concluded that"*

It is important to focus on the lead-in phrase at the beginning of a question to determine whether it is positive or negative. Do not skim over the lead-in phrase.

Positive lead-in phrases are followed by four invalid conclusions and one valid conclusion. Your task is to find the valid one. Negative lead-in phrases, by contrast, are followed by four valid conclusions and only one invalid conclusion. The task in these questions is to determine what **cannot** be validly concluded based on the facts in the paragraph.

The lead-in phrase may also limit the possible answers in some way. For example, a lead-in phrase such as *"From the information given above, it can be validly concluded that, during the 1990's in California"* means that there might be different answers based on other times and places, but for the purpose of the test question, only conditions in California during the 1990's (as described in the paragraph) should be considered.

Reasoning About Groups or Categories

As was stated before, not all information is of the same type. There can be information about events or situations, and there can be information about individuals and groups (or categories). Next, we discuss how to deal with information about groups or categories.

"All" Statements

A statement about two groups that begins with the words "all" or "every" gives you some important information about how the two groups are related. The words "all" and "every" tell you that everything in the first group is also in the second group. For example, in the statement, "All the law enforcement officers on the case are Federal law enforcement officers," the first group, consisting of law enforcement officers on the case, is totally included in the second group, consisting of Federal law enforcement officers.

> "All" and "Every" are KEY WORDS that signify important information about how two groups are related.

The "all" statement does not provide sufficient information to determine whether or not all members of the second group are included in the first group. Suppose that a librarian told you "All the books on this set of shelves are about law enforcement." From this information, you might be tempted to conclude that all of the library's books on law enforcement (the second group) are on that set of shelves (the first group), but this conclusion is invalid. The books on those shelves might only be part of the entire group of books on law enforcement. The sentence does NOT provide information on whether or not other law enforcement books are placed elsewhere in the library. The following examples provide an "all" statement (all of Group A are Group B) followed by an invalid "all" statement (all of Group B are Group A). To develop a good grasp of this concept, try to create some examples of your own.

Table 1: Invalid Conclusions from "All" statements	
True:	All the people at my party speak Spanish.
Invalid Conclusion:	All the people who speak Spanish are at my party.
True:	All Supreme Court justices are lawyers.
Invalid Conclusion:	All lawyers are Supreme Court justices.
True:	All U.S. Presidents were elected officials.
Invalid Conclusion:	All officials who were elected are U.S. Presidents.

Table 1, continued	
True:	Every Intelligence Research Specialist works for the U.S. Government.
Invalid Conclusion:	Everyone working for the U.S. Government is an Intelligence Research Specialist.
True:	Every U.S. Senator is a member of the U.S. Congress.
Invalid Conclusion:	Every member of the U.S. Congress is a U.S. Senator.

Every "all" statement provides sufficient information to determine that at least some members of the second group are included in the first group. Returning to our previous examples, we can validly conclude that "some Federal law enforcement officers are on the case" and that "some of the books about law enforcement are on this set of shelves." Developing numerous examples on your own of a true "all" statement (all of Group A are Group B) and a "some" statement (some of Group B are Group A) will help you to develop a mastery of this concept.

Table 2: Valid Conclusions from "All" Statements	
True:	All the people at my party speak Spanish.
Valid Conclusion:	Some people who speak Spanish are at my party.
True:	All Supreme Court justices are lawyers.
Valid Conclusion:	Some lawyers are Supreme Court justices.
True:	All U.S. Presidents were elected officials.
Valid Conclusion:	Some officials who were elected are U.S. Presidents.
True:	Every Intelligence Research Specialist works for the U.S. Government.
Valid Conclusion:	Some employees of the U.S. Government are Intelligence Research Specialist.
True:	Every U.S. Senator is a member of the U.S. Congress.
Valid Conclusion:	Some members of the U.S. Congress are U.S. Senators.

Reasoning From "None" and "Not" Statements

Information that something is **NOT** true is useful information. For example, you may learn that one group of things is **NOT** part of another group of things. This is the same as saying that there is no overlap at all between the two groups of things. Here, you can draw conclusions about either group as it relates to the other since you can count on the fact that the two groups have no members in common. If you can say that none of the stolen cars recovered from the rail yards were cars stolen from Canada, you can **also** say that none of the cars stolen from Canada were recovered from the rail yards because you know that the first statement means that there is no overlap between the two groups. In the test, you will see phrases or terms such as "It is not the case that" or "Not all of" or words that begin with the prefix "non-." All of these are ways to say that a negative fact has been established.

> "No" and "not" are KEY WORDS that signify important information about how two groups are related.

Sometimes, our ordinary speech habits can cause us to jump to conclusions. Most people would not make a statement such as "Some of the pizza has no pepperoni" unless they are trying to suggest at the same time that some of the pizza does have pepperoni. By contrast, a detective might make a statement such as "some of the bloodstains were not human blood" simply because only part of the samples had come back from the laboratory. The detective is trying to suggest that at least some of the bloodstains were not human blood. The rest of the bloodstains might or might not be human blood.

As you work through the practice test, think about each negative phrase or term you find. Take care to assume only as much as is definitely indicated by the facts as given, and no more.

Reasoning About Parts of a Group

The term "some" refers to a part of a larger group. For example, in the statement "Some Intelligence Research Specialists are taking specialized training," the term "some Intelligence Research Specialist" refers to a portion of the group of all Intelligence Research Specialist. You should note, however, that the fact that we know that "some Intelligence Research Specialist are taking specialized training" implies nothing about the remaining portion of the set of Intelligence Research Specialist: other Intelligence Research Specialist may or may not be taking specialized training. Unless information is provided in the paragraph to the contrary, treat "some" as meaning "at least some."

Statements that refer to a portion of a set may contain other terms such as "most," "a few," or "almost all." Also, as discussed in the previous section, they can be negative, as in "Many Intelligence Research Specialist are not fluent in French." From this statement you may be tempted to infer that there are at least a few Intelligence Research Specialist who <u>are</u> fluent in French, but that would be jumping to a conclusion. From this statement alone, you do not know about the entire group of Intelligence Research Specialist and whether or not they are fluent in French. In these cases, you should remember that the term refers only to a part of the group and that from this information on part of the group you cannot infer anything about the rest of the group. Neglecting this principle of sound reasoning can cause costly errors.

> Unless information is provided in the paragraph to the contrary, treat "some" as meaning "at least some."

When you see a paragraph describing parts of a group, read the paragraph carefully to see if that description is based on knowledge of the entire group or only on knowledge of part of the group.

Reasoning About "If-Then" Statements

As was said before, there can be information about events or situations, and there can be information about individuals and groups. Previously, we discussed how to deal with information about groups. Next, we discuss how to deal with information about the relationship between events or situations.

We are all familiar with the idea of a cause and effect in which one thing leads to another thing, which in turn leads to a third thing, and so on. For example, "if a financial institution suspects that a deposit of funds stems from criminal activity, the institution is required to report the deposit transaction to the authorities." In this example, a suspicious deposit is a cause and the institution reporting the deposit is the effect.

Cause and effect means that when the first thing happens, the later event MUST follow. For example, if First Salem Bank suspects that Mr. Tubill deposited funds stemming from criminal activity, First Salem Bank is required to report Mr. Tubill's deposit to the authorities.

The cause and effect relationship also informs you that if the effect never occurred, the cause MUST NOT have occurred. For example, if First Salem Bank is NOT required to report Mr. Tubill's deposit to the authorities, then First Salem Bank does NOT suspect that Mr. Tubill deposited funds stemming from criminal activity.

The wording we typically use to indicate this kind of cause and effect linkage between events includes the simple "if-then" sentence in which the first event is in a statement tagged by "if" and the second event is in a statement tagged by "then." The "if-then" statement can also be used to express relationships other than the cause and effect relationship. Permission is sometimes expressed using the "if-then" statement. For instance, if an individual wishes to open a checking account anonymously, the individual may not open the account. Obligation is also sometimes expressed using the "if-then" statement. For example, if an officer places an individual under arrest, the arrestee must be provided with Miranda warnings.

What cause and effect, permission, and obligation all have in common is that they relate one event or situation to another event or situation. In this relationship, two things are always true. First, whenever the first event or situation occurs, the second event or situation MUST occur. Second, whenever the second event or situation has not occurred, then the first event or situation MUST NOT have occurred.

"If" and "Whenever" signify that important information is presented.

It is important to realize that the relationship expressed by any "if-then" statement works in one direction only: the converse of the "if-then" statement is invalid. For example, you learn that "If the jet engines are reversed, then the speed of the plane will decrease very rapidly." This sentence does NOT mean that the only possible cause of the plane decreasing speed very rapidly is that the jet engines are reversed. Therefore, from this information you cannot validly infer the converse statement, "If the speed of the plane decreases very rapidly, then the jet engines have been reversed." There might be some other cause for the speed of the plane to decrease rapidly. The following examples start with a true "if-then" sentence, followed by an invalid "if-then" sentence with the relationship of the first and second statements conversed.

Table 3: Invalid Conclusions from "If-Then" Statements	
True:	If a person is an Intelligence Research Specialist, the person is an employee of the U.S. Government.
Invalid Conclusion:	If a person is an employee of the U.S. Government, the person is an Intelligence Research Specialist.
True:	If a criminal receives a pardon, the criminal will be released.
Invalid Conclusion:	If a criminal is released, the criminal has received a pardon.
True:	If a person is convicted of murder, that person is guilty of a felony.
Invalid Conclusion:	If a person is guilty of a felony, that person has been convicted of murder.
True:	If a person lives in Germany, the person lives in Europe.
Invalid Conclusion:	If a person lives in Europe, the person lives in Germany.
True:	If a car has no gas, the car will not run.
Invalid Conclusion:	If a car does not run, the car has no gas.

Whenever the second event or situation has not occurred, then the first event or situation MUST NOT have occurred. This means that you can validly converse the relationship of these two statements as long as the statements are negated (made opposite). For example, you learn that "If the jet engines are reversed (the first statement), the speed of the plane will decrease very rapidly (the second statement)." Given that the information is true, it cannot be the case that the jet engines are reversed but the speed of the plane does not decrease very rapidly. Therefore, you can validly infer that "If the speed of the plane does not decrease very rapidly (the negation or opposite of the second statement), then the jet engines have not been reversed" (the negation or opposite of the first statement). The following examples start with a true "if-then" sentence, followed by a true (or valid) "if-then" sentence with the relationship of the first and second statements conversed and the statements themselves made opposite (negated).

Table 4: Valid Conclusions from "If-Then" Statements	
True:	If a person is an Intelligence Research Specialist, the person is an employee of the U.S. Government.
Valid Conclusion	If a person is not an employee of the U.S. Government, the person is not an Intelligence Research Specialist.
True:	If a criminal receives a pardon, the criminal will be released.
Therefore, True:	If a criminal is not released, the criminal has not received a pardon.
True:	If a person is convicted of murder, that person is guilty of a felony.
Therefore, True:	If a person is not guilty of a felony, that person has not been convicted of murder.
True:	If a person lives in Germany, the person lives in Europe.
Therefore, True:	If a person does not live in Europe, the person does not live in Germany.
True:	If a car has no gas, the car will not run.
Therefore, True:	If a car runs, the car has gas.

When the effect in a cause and effect relationship has not happened, the cause must not have happened.

As was said before, you can infer the opposite of the first statement from the opposite of the second statement. However, you cannot infer the opposite of the second statement from the opposite of the first statement. For example, you cannot validly infer that "If the jet engines are not reversed (the opposite of the first statement), then the speed of the plane does not decrease very rapidly" (the opposite of the second statement). The following examples start with a true "if-then" sentence followed by an invalid "if-then" sentence in which the first and second statements have been made opposite.

Table 5: More Invalid Conclusions from "If-Then" Statements	
True:	If a person is an Intelligence Research Specialist, the person is an employee of the U.S. Government.
Invalid Conclusion:	If a person is not an Intelligence Research Specialist, the person is not an employee of the U.S. Government.
True:	If a criminal receives a pardon, the criminal will be released.
Invalid Conclusion:	If a criminal does not receive a pardon, the criminal will not be released.
True:	If a person is convicted of murder, that person is guilty of a felony.
Invalid Conclusion:	If a person is not convicted of murder, that person is not guilty of a felony.
True:	If a person lives in Germany, the person lives in Europe.
Invalid Conclusion:	If a person does not live in Germany, the person does not live in Europe.
True:	If a car has no gas, the car will not run.
Invalid Conclusion:	If a car has gas, the car will run.

A Few Final Cautions About Wording

There are test preparation classes that train people to take tests. In some of these classes, students are advised against choosing any answer in a reasoning test if it starts with the word "all" or the word "none." This is supposed to be useful advice because it is believed that most correct answers strike a balance between extremes and usually do not cover subjects that can be summarized in sentences beginning with "all" or "none." If you have heard this advice before, you should ignore it for this test. "All" statements and "none" statements occur in real-life situations and, consequently, you will be asked to work with them in this test in the reading paragraphs as well as in both correct and incorrect responses.

In general, you should pay attention to any words that provide information on groups or on linked events. This includes a wide range of negative words (such as "seldom" or "never" or "illegal" or "prohibited") and negative prefixes (such as "non-" "un-" or "dis-"). It also includes positive words (such as "all" or "some" or "most" or "always"). You should also watch for connectors such as "whenever" or "unless" or "except," since these words sometimes contain key information about relations among the facts given in the paragraph.

> Look for KEY WORDS such as "all," "some," "none," and "if" and
> for negative prefixes such as "non-," "un-," or "dis-."

English is a language that ordinarily uses single negatives. The word
"not," by itself, does the job of making a formal English sentence into
its opposite: "That bird is NOT an eagle." On this test, if you read a
sentence such as "The cord is not wound," it means the cord is still
unwound. When an English sentence has two negatives, the sentence
has a positive meaning. For example, a sentence that reads "This
application is NOT unworthy" means that the application IS worthy.
The sentence "The bell did ring" could be stated, "It is NOT the case
that the bell did NOT ring."

Finally, it is extremely important to pay close attention to the use of
the word "ONLY." A sentence such as "The door will open IF AND
ONLY IF both keys are used" is a very strong statement that means
that there is just one way to open the door—with both keys. If the
sentence just said, "The door will open if the key is used," there may
be several other ways to open the door. But that is not the case when
the expression "if and only if" is used.

Drawing Probabilistic Conclusions

When working on cases, Intelligence Research Specialist frequently must make decisions and draw conclusions that have some probability of being true, but they are not definitely true. On the test, there are questions that ask you to apply this type of logic. In each of the questions of this type, you will be presented with a paragraph of information and five response options. Your task is to select the response option that can be validly concluded from the information given in the paragraph. Use only the information provided in the paragraph. Do not speculate or make assumptions that go beyond this information. Also, assume that all information given in the paragraph is true, even if it conflicts with some fact that is known to you. Keep in mind that each question has only one correct answer.

When you have information about a group, you can apply that information to an individual member of that group with a degree of certainty. In other words, you can establish the probability that the information you have about the group applies to a single member of the group. For example, if most felons are repeat offenders and K.B. is a felon, then you can conclude that K.B. is most likely a repeat offender.

In order to establish a numerical probability, you must have information about the entire group. Although it may not be immediately obvious, percentages provide information about an entire group.

For example, if you know that 30% of all Intelligence Research Specialists use quantitative methods to analyze intelligence information, you know that **only** 30% of Intelligence Research Specialists have used quantitative methods to analyze intelligence information. The percentage does not mean that at least 30% of Intelligence Research Specialists have used quantitative methods to analyze intelligence information. Because only 30% percent have used quantitative methods to analyze intelligence information, you know that the remaining Intelligence Research Specialists have **not** used quantitative methods to analyze intelligence information. Therefore, of all Intelligence Research Specialists, 70% (100% - 30% = 70%) have not used quantitative methods to analyze intelligence information. The entire group of Intelligence Research Specialist has been accounted for: 30% have used quantitative methods to analyze intelligence information and 70% have not.

Speaking more abstractly, we are dealing with statements about two groups in which a percentage is used to modify the first group. The percentage tells us that a portion of the first group is included in the second group, but the remainder of the first group is not included in the second group. Thus, the entire first group is accounted for. The following examples start with a true statement expressing something

about a portion of a group using a percentage, followed by a true statement expressing the opposite about the remaining portion of the group.

Table 6: Valid Probabilistic Conclusions	
True:	Of all Government employees, 5% work for the Department of Justice.
Therefore, True:	Of all Government employees, 95% do not work for the Department of Justice.
True:	Eighty-five percent of state criminals did not receive parole.
Therefore, True:	Fifteen percent of state criminals received parole.
True:	Of all the visa applications, 10% were denied.
Therefore, True:	Of all the visa applications, 90% were not denied.

To determine a probability, you apply the information about the group to an individual member of the group. For example, if you pick one of the Intelligence Research Specialist at random, your chances of picking one who has used quantitative methods to analyze intelligence information is equal to the percentage of Intelligence Research Specialist who have used quantitative methods to analyze intelligence information. Because 30% of all Intelligence Research Specialist have used quantitative methods to analyze intelligence information, you can conclude that any particular Intelligence Research Specialist has a 30% chance of having used quantitative methods to analyze intelligence information. Furthermore, if you pick one of the Intelligence Research Specialist at random, your chances of picking one who has not used quantitative methods to analyze intelligence information is equal to the percentage of Intelligence Research Specialists who have not used quantitative methods to analyze intelligence information. You can validly conclude that any particular Intelligence Research Specialist has a 70% chance of not having used quantitative methods to analyze intelligence information because 70% of all Intelligence Research Specialist have not used quantitative methods to analyze intelligence information. The following examples start with a true statement about a group, followed by two valid statements expressing probability about an individual member of the group.

To determine a probability, you apply the information about the group to an individual member of the group.

Table 7: More Valid Probabilistic Conclusions	
True:	Of all Government employees, 5% work for the Department of Justice.
Therefore, True:	There is a 5% chance that a Government employee chosen at random works for the Department of Justice.
Therefore, True:	There is a 95% chance that a Government employee chosen at random does not work for the Department of Justice.
True:	Eighty-five percent of state criminals did not receive parole.
Therefore, True:	There is an 85% chance that a state criminal chosen at random did not receive parole.
Therefore, True:	There is a 15% chance that a state criminal chosen at random received parole.
True:	Of all the visa applications, 10% were denied.
Therefore, True:	There is a 10% chance that a visa application chosen at random was denied.
Therefore, True:	There is a 90% chance that a visa application chosen at random was not denied.

We looked at two types of valid conclusions. These valid conclusions were based on applying the given percentage to a member of the first group. Now, let us look at two types of invalid conclusions. These invalid conclusions are based on mistakenly applying the given percentage to a member of the second group.

Remember that a statement about two groups that begins with the word "all" gives you information about how the two groups are related. The word "all" tells you that everything in the first group is also in the second group. However, the "all" statement does not provide sufficient information to determine whether or not all members of the second group are included in the first group. Likewise, statements that use a percentage to describe the first group do not provide sufficient information to determine the portion of members of the second group that are included in the first group.

Having information about the entire first group in the statement is not the same as having information about the entire second group. For example, knowing that 60% of Intelligence Research Specialists have written threat assessments (and, thus, that 40% of them have not) is not the same as knowing that of everyone who has written threat assessments, 60% are Intelligence Research Specialists. It may be the case that 60% of those who have written threat assessments are Intelligence Research Specialists, but it might not be the case. There is insufficient information about the entire set of people who have written

threat assessments to make exact percentage determinations about them.

In these statements that relate two groups using a percentage, the percentage given only applies to one group. In our example, the percentage applies to the first group, Intelligence Research Specialist, not to the second group (namely, those who have written threat assessments). The following examples start with a true statement followed by two invalid statements where the percentage is incorrectly applied to the second group.

Table 8: Invalid Probabilistic Conclusions	
True:	Of all Government employees, 5% work for the Department of Justice.
Invalid Conclusion:	Of all employees of the Department of Justice, 5% work for the Government.
Invalid Conclusion:	Of all employees of the Department of Justice, 95% do not work for the Government.
True:	Eighty-five percent of state criminals did not receive parole.
Invalid Conclusion:	Eighty-five percent of those who received parole were not state criminals.
Invalid Conclusion:	Fifteen percent of those who received parole were state criminals.
True:	Of all the visa applications, 10% were denied.
Invalid Conclusion:	Of all the denied applications, 10% were visa applications.
Invalid Conclusion:	Of all the denied applications, 90% were not visa applications.

Because the percentage applies to the first group, not the second group, any statement of probability that is based on applying the percentage to the second group is invalid. For example, there is insufficient information about those who have written threat assessments to determine the probability that a person who has written threat assessments is an Intelligence Research Specialist. Also, there is insufficient information to determine the probability that a person who has written threat assessments is not an Intelligence Research Specialist. The following examples start with a true statement followed by two invalid statements where a probability is determined based on the inappropriate application of the percentage to the second group.

Table 8: More Invalid Probabilistic Conclusions	
True:	Of all Government employees, 5% work for the Department of Justice.
Invalid Conclusion:	An employee of the Department of Justice chosen at random has a 5% of working for the Government.
Invalid Conclusion:	An employee of the Department of Justice chosen at random has a 95% of not working for the Government.
True:	Eighty-five percent of state criminals did not receive parole.
Invalid Conclusion:	The chances are 85% that a person selected at random who received parole was not a state criminal.
Invalid Conclusion:	The chances are 15% that a person selected at random who received parole was a state criminal.
True:	Of all the visa applications, 10% were denied.
Invalid Conclusion:	The chances are 10% that a denied application chosen at random is a visa application.
Invalid Conclusion:	The chances are 90% that a denied application chosen at random is not a visa application.

Remember These Tips When Taking the Logical Reasoning Test

1. In questions with positive lead statements, always choose the only conclusion that can definitely be drawn from the information given in the paragraph.

2. Remember NOT to use any outside factual information to reach your conclusion.

3. Read the lead-in sentence and the paragraph very carefully. Also, read all the answer choices before you mark the one you think is correct.

4. Pay special attention whenever the question uses words such as "all," "some," or "none." Other terms such as "unless" or "except" or "only" are also important. These words help to define the facts from which you must draw conclusions.

5. Also pay special attention whenever you see a negative prefix such as "non-" or a negative verb such as "disconnect" or "unfasten." These may be crucial to understanding the basic facts in the paragraph.

6. Ignore any advice you may have received in the past about avoiding an answer that contains the word "all" or the word "none." These may be signs of an incorrect response in some tests, but not in this test. You will find these words in both right and wrong response options.

7. Take the sample test and study the explanation for each of the questions very carefully. This will help you fine-tune your reasoning on the actual test.

LOGICAL REASONING PRACTICE TEST

The practice test contains questions that are similar to, but not exactly the same as, the questions on the real test. The practice test is followed by detailed explanations of every practice test question. These explanations will give you information about what is correct about the correct response options and what is incorrect about the wrong response options. Understanding the reasons for the correct and incorrect response options should assist you in distinguishing between a right and wrong answer on the test.

PRACTICE TEST

*In questions 1 through 10, some questions will ask you to select the only answer that can be validly concluded from the paragraph. These questions include a paragraph followed by five response options. Preceding the five response options will be the phrase "From the information given above, it can be validly concluded that." In other questions you may be asked to select the only answer that **cannot** be validly concluded from the paragraph. These questions include a paragraph followed by five response options. Preceding the five response options will be the phrase "From the information given above, it CANNOT be validly concluded that."*

*You must use **only** the information provided in the paragraph, without using any outside information whatsoever.*

It is suggested that you take not more than 20 minutes to complete questions 1 through 10. The questions on this practice test will not be on the real test, but the real questions will be similar in form and difficulty to these. The explanations for the correct and incorrect responses are found after the sample questions.

1. Often, crimes are characterized as either *malum in se*—inherently evil—or *malum prohibitum*— criminal because they are declared as offenses by a legislature. Murder is an example of the former. Failing to file a tax return illustrates the latter. Some jurisdictions no longer distinguish between crimes *malum in se* and *malum prohibitum,* although many still do.

   From the information given above, it can be validly concluded that

   A) many jurisdictions no longer distinguish between crimes *malum in se* and *malum prohibitum*
   B) some jurisdictions still distinguish between crimes *malum in se* and *malum prohibitum*
   C) some crimes characterized as *malum in se* are not inherently evil
   D) some crimes characterized as *malum prohibitum* are not declared by a legislature to be an offense
   E) sometimes failing to file a tax return is characterized as *malum in se*

2. A trucking company can act as a *common carrier*—for hire to the general public at published rates. As a common carrier, it is liable for any cargo damage, unless the company can show that it was not negligent. If the company can demonstrate that it was not negligent, then it is not liable for cargo damage. In contrast, a *contract carrier* (a trucking company hired by a shipper under a specific contract) is only responsible for cargo damage as spelled out in the contract. A Claus Inc. tractor-trailer, acting under common carrier authority, was in a 5-vehicle accident that damaged its cargo. A Nichols Inc. tractor-trailer, acting under contract carrier authority, was involved in the same accident, and its cargo was also damaged.

   From the information given above, it can be validly concluded that, in reference to the accident,

   A) if Claus Inc. is liable, then it can show that it was not negligent
   B) if Claus Inc. cannot show that it was not negligent, then it is not liable
   C) if Claus Inc. can show that it was not negligent, then it is not liable
   D) if Nichols Inc. is liable, then it cannot show that it is negligent
   E) if Nichols Inc. can show that it is not negligent, then it is not liable

3. A rapidly changing technical environment in government is promoting greater reliance on electronic mail (e-mail) systems. As this usage grows, there are increasing chances of conflict between the users' expectations of privacy and public access rights. In some investigations, access to <u>all</u> e-mail, including those messages stored in archival files and messages outside the scope of the investigation, has been sought and granted. In spite of this, some people send messages through e-mail that would never be said face-to-face or written formally.

   *From the information given above, it **CANNOT** be validly concluded that*

   A) some e-mail messages that have been requested as part of investigations have contained messages that would never be said face-to-face
   B) some messages that people would never say face-to-face are sent in e-mail messages
   C) some e-mail messages have been requested as part of investigations
   D) e-mail messages have not been exempted from investigations
   E) some e-mail messages contain information that would be omitted from formal writing

4. Phyllis T. is a former Federal employee who was entitled to benefits under the Federal Employee Compensation Act because of a job-related, disabling injury. When an eligible Federal employee has such an injury, the benefit is determined by this test: If the beneficiary is married or has dependents, benefits are 3/4 of the person's salary at the time of the injury; otherwise, benefits are set at 2/3 of the salary. Phyllis T.'s benefits were 2/3 of her salary when she was injured.

   From the information given above, it can be validly concluded that, when Phyllis T. was injured, she

   A) was married but without dependents
   B) was not married and had no dependents
   C) was not married but had dependents
   D) was married and had dependents
   E) had never been married

5. Some 480,000 immigrants were living in a certain country in 1999. Although most of these immigrants were not employed in professional occupations, many of them were. For instance, many of them were engineers and many of them were nurses. Very few of these immigrants were librarians, another professional occupation.

    From the information given above, it can be validly concluded that, in 1999, in the country described above,

    A) most immigrants were either engineers or nurses
    B) it is not the case that some of the nurses were immigrants
    C) none of the engineers were immigrants
    D) most of those not employed in professional occupations were immigrants
    E) some of the engineers were immigrants

6. Police officers were led to believe that many weapons sold at a certain gun store were sold illegally. Upon investigating the lead, the officers learned that all of the weapons sold by the store that were made by Precision Arms were sold legally. Also, none of the illegally sold weapons were .45 caliber.

    From the information given above, it can be validly concluded that, concerning the weapons sold at the store,

    A) all of the .45 caliber weapons were made by Precision Arms
    B) none of the .45 caliber weapons were made by Precision Arms
    C) some of the weapons made by Precision Arms were .45 caliber weapons
    D) all of the .45 caliber weapons were sold legally
    E) some of the weapons made by Precision Arms were sold illegally

7. Impressions made by the ridges on the ends of the fingers and thumbs are useful means of identification, since no two persons have the same pattern of ridges. If finger patterns from fingerprints are not decipherable, then they cannot be classified by general shape and contour or by pattern type. If they cannot be classified by these characteristics, then it is impossible to identify the person to whom the fingerprints belong.

    *From the information given above, it **CANNOT** be validly concluded that*

    A) if it is possible to identify the person to whom fingerprints belong, then the fingerprints are decipherable
    B) if finger patterns from fingerprints are not decipherable, then it is impossible to identify the person to whom the fingerprints belong
    C) if fingerprints are decipherable, then it is impossible to identify the person to whom they belong
    D) if fingerprints can be classified by general shape and contour or by pattern type, then they are decipherable
    E) if it is possible to identify the person to whom fingerprints belong, then the fingerprints can be classified by general shape and contour or pattern type

8. Explosives are substances or devices capable of producing a volume of rapidly expanding gases that exert a sudden pressure on their surroundings. Chemical explosives are the most commonly used, although there are mechanical and nuclear explosives. All mechanical explosives are devices in which a physical reaction is produced, such as that caused by overloading a container with compressed air. While nuclear explosives are by far the most powerful, all nuclear explosives have been restricted to military weapons.

    From the information given above, it can be validly concluded that

    A) all explosives that have been restricted to military weapons are nuclear explosives
    B) no mechanical explosives are devices in which a physical reaction is produced, such as that caused by overloading a container with compressed air
    C) some nuclear explosives have not been restricted to military weapons
    D) all mechanical explosives have been restricted to military weapons
    E) some devices in which a physical reaction is produced, such as that caused by overloading a container with compressed air, are mechanical explosives

9. The alphanumeric coding of a fingerprint is a systematic description of the main patterns on the print. Within a certain metropolitan district, 90% of the population have fingerprints that can be alphanumerically coded.

    From the information given above, it can be validly concluded that the fingerprints of a person from this district, selected at random,

    A) can be alphanumerically coded, with a probability of 10%
    B) can be alphanumerically coded, with a probability of less than 90%
    C) cannot be alphanumerically coded, with a probability of 10%
    D) cannot be alphanumerically coded, with a probability of up to 90%
    E) may be coded alphanumerically, but the probability is unknown

10. The printed output of some computer-driven printers can be recognized by forensic analysts. The "Acme Model 200" printer was manufactured using two different inking mechanisms, one of which yields a "Type A" micropattern of ink spray around its characters. Of all Acme Model 200 printers, 70% produce this Type A micropattern, which is also characteristic of some models of other printers. Forensic analysts at a crime lab have been examining a kidnap ransom note which clearly exhibits the Type A micropattern.

    From the information given above, it can be validly concluded that this note

    A) was printed on an Acme Model 200 printer, with a probability of 70%
    B) was printed on an Acme Model 200 printer, with a probability of 30%
    C) was not printed on an Acme Model 200 printer, with a probability of 70%
    D) was not printed on an Acme Model 200 printer, with a probability of 30%
    E) may have been printed on an Acme Model 200 printer, but the probability cannot be estimated

Analysis of Logical Reasoning Practice Test Questions

1. Correct Answer:
B) some jurisdictions still distinguish between crimes *malum in se* and *malum prohibitum*

This question is concerned with classification of crimes into sets—that is, with the classification of crimes as either *malum in se* or *malum prohibitum*. The last phrase in the last sentence tells us that many jurisdictions make the distinction between these two categories of crimes. Response B follows from that sentence, because if many jurisdictions make the distinction, some jurisdictions make the distinction. From the fact that many jurisdictions make the distinction, it cannot be inferred that many do <u>not</u> make the distinction. Therefore, Response A is incorrect.

Responses C, D, and E are based on erroneous definitions of the two classes of crimes. The paragraph tells us that all crimes characterized as *malum in se* are inherently evil. Response C is false because it cannot be the case that SOME crimes characterized as *malum in se* are NOT inherently evil. The paragraph also tells us that all crimes characterized as *malum prohibitum* are declared as offenses by a legislature. Response D is false because it cannot be the case that SOME crimes characterized as *malum prohibitum* are NOT declared by a legislature to be an offense. In the paragraph, we are told that filing a tax return late is *malum prohibitum*, rather than *malum in se*. Response E is incorrect because it cannot be the case that failing to file a tax return is *malum in se*.

2. Correct Answer:
C) If Claus Inc. can show that it was not negligent, then it is not liable

The second sentence states the liability rule for common carriers: all common carriers are liable for cargo damage unless they can show that they are not negligent; if they can show that they are not negligent, then they are not liable for cargo damage. Claus Inc. is a common carrier, and accordingly this rule applies to it. From this rule it follows that if Claus Inc. can show it was not negligent, then it is not liable, Response C. Response A contradicts this rule by claiming that when Claus Inc. is liable it can show that it was not negligent. Response B contradicts this rule by claiming that Claus Inc. is not liable even when it cannot show that it is not negligent. Responses D and E concern Nichols Inc., a contract carrier. However, the terms of the Nichols Inc. contract were not disclosed in the paragraph, so neither response is supported.

3. Correct Answer:
A) some e-mail messages that have been requested as part of investigations have contained messages that would never be said face-to-face.

This is an example of a test question with a negative lead-in statement. It asks for the conclusion that is NOT supported by the paragraph. That means that four of the statements are valid conclusions from the paragraph while one is not. Response B (some messages that people would never say face-to-face are sent in e-mail messages) is a valid conclusion because it restates a fact given in the last sentence of the paragraph. Response E (some e-mail messages contain information that would be omitted from formal writing) is valid because it restates the other fact in the last sentence of the paragraph.

The next-to-last sentence in the paragraph is the source of both response C (some e-mail messages have been requested as part of investigations) and response D (e-mail messages have not been exempted from investigations). Both of these choices restate information in that sentence, based on the fact that access to e-mail messages was sought and granted. This leaves only the first option, response A (Some e-mail messages that have been requested as part of investigations have contained messages that would never be said face-to-face). This is the only choice that does NOT represent a valid conclusion, because even though we know from the paragraph that there is a group of e-mail messages that are requested in investigations and also that there is a group of messages that contain information that people would not say face-to-face, there is nothing that says that these groups overlap. We simply do not know.

4. Correct Answer:
B) Phyllis T. was not married and had no dependents.

This question concerns an either/or situation. The paragraph states that benefits under the Federal Employees Compensation Act are awarded at one level (3/4 of salary) if a beneficiary is married or has dependents when injured and at another level (2/3 of salary) if this is not true.

Phyllis T. is eligible for benefits under the Act. The paragraph states that Phyllis T.'s benefit level was 2/3 of her salary. Given this benefit level, it is clear that Phyllis T. did not meet either of the conditions for the 3/4 level. Therefore, responses A, C, and D cannot be correct (A states that she was married, C states that she had dependents, and D states that she both was married and had dependents). Response E goes beyond the facts given because prior marriages are not listed as a factor relating to this benefit. The one correct conclusion is that Phyllis T. did not meet either requirement to qualify for the higher benefit level (3/4 of salary), so response B is the correct answer to the question.

5. Correct Answer:
E) some of the engineers were immigrants

Response E is correct because it restates the third sentence in terms of the overlap between immigrants and engineers in the country described in the paragraph. Response A says that most immigrants are engineers or nurses, which are professional occupations. However, the second sentence says that most immigrants are not employed in professional occupations, so Response A is false. Response B is false because it denies that there is any overlap between immigrants and nurses, even though this overlap is clear from the third sentence of the paragraph. Response C is false because it denies the overlap between immigrants and engineers. Because the paragraph does not give complete information about the non-professionals (immigrant and non-immigrant) in the country described in the paragraph, Response D is invalid.

6. Correct Answer:
D) all of the .45 caliber weapons were sold legally

The second and last sentences are the two main premises in the paragraph. These two sentences give information about three categories of weapons: weapons made by Precision Arms, weapons sold legally, and .45 caliber weapons.

The last sentence states that none of the illegally sold weapons were .45 caliber. This means that none of the .45 caliber weapons were sold illegally. Notice that this new statement is a double negative. In affirmative form the statement means that all of the .45 caliber weapons were sold legally, Choice D.

The information that all of the .45 caliber weapons were sold legally (last sentence), combined with the information that all of the weapons made by Precision Arms were sold legally (second sentence), allows us to draw no valid conclusions about the relationship between the .45 caliber weapons and the weapons made by Precision Arms. There is insufficient information about the entire group of weapons sold legally to know whether the group of .45 caliber weapons and the group of weapons made by Precision Arms overlapped entirely (Choice A), partially (Choice C), or not at all (Choice B).

Choice E contradicts the second sentence and is, therefore, invalid.

7. Correct Answer:
C) if fingerprints are decipherable, then it is impossible to identify the person to whom they belong

This question asks for the response option that cannot be validly concluded from the information in the paragraph. The only response option that cannot be validly concluded is Response C, so the correct answer to question 7 is Response C. Response C is invalid because the paragraph does not provide enough information to conclude whether or not it would be possible to identify the person to whom the fingerprints belong from the mere fact that the fingerprints are decipherable.

Response A refers to a condition where it is possible to identify the person to whom fingerprints belong. Based on the final sentence in the paragraph, this condition of fingerprints means that the fingerprints could be classified by general shape and contour or by pattern type. Based on the second sentence, the ability to classify the fingerprints means that the fingerprints are decipherable.

Since Response B refers to a condition in which finger patterns from fingerprints are not decipherable, we know from the second sentence that, in that circumstance, they cannot be classified by general shape and contour or by pattern type. From the final sentence in the paragraph, we can infer that since they cannot be classified by these characteristics, then it is impossible to identify the person to whom the fingerprints belong.

According to the second sentence, fingerprints cannot be classified by general shape and contour or by pattern type when they are not decipherable. Therefore, if fingerprints can be classified by general shape and contour or by pattern type, then the fingerprints must be decipherable, Response D. According to the third sentence, it is impossible to identify the owner of a set of fingerprints when the fingerprints cannot be classified by general shape and contour or by pattern type. Therefore, if it is possible to identify the person to whom fingerprints belong, then the fingerprints must be able to be classified by general shape and contour or pattern type, Response E. Notice that Responses D and E are valid based on the same type of reasoning. The first and second statements of the second sentence were made opposite and reversed in Response D, and the first and second statements of the final sentence were made opposite and reversed in Response E.

8. Correct Answer:
E) some devices in which a physical reaction is produced, such as that caused by overloading a container with compressed air, are mechanical explosives

The correct answer is E. The third sentence states the overlap between all mechanical explosives and devices in which a physical reaction is produced, such as that caused by overloading a container with compressed air. From this, we can safely conclude that some devices in which a physical reaction is produced, such as that caused by overloading a container with compressed air, are mechanical explosives.

Response A is incorrect because the paragraph does not provide sufficient information to validly conclude that all explosives which have been restricted to military weapons are nuclear weapons. It may be that some types of explosives other than nuclear weapons also have been restricted to military weapons.

Responses B and C are incorrect because they contradict the paragraph. Response B contradicts the third sentence, and Response C contradicts the last sentence.

Response D is incorrect because the paragraph provides no information about whether or not mechanical explosives are restricted to military weapons.

9. Correct Answer:
C) the fingerprints of a person from this district, selected at random, cannot be alphanumerically coded, with a probability of 10%

We know from the second sentence that 90% of the people in this district have fingerprints that can be coded. Therefore, we know that 10% (100%-90%=10%) have fingerprints that cannot be coded. Given this information, the chance of selecting a person from this district with fingerprints that can be coded is 90% and the chance of selecting a person from this district with fingerprints that cannot be coded is 10%. Response A is incorrect because a probability of 10% is an underestimate of the probability that the fingerprints of a person from this district can be coded. Response B is incorrect because, like response A, it is an underestimate. Response D is incorrect because it is an overestimate of the probability that the fingerprints of a person from this district cannot be coded. Response E is incorrect because the probability that the fingerprints can be coded is known to be 90%.

10. Correct Answer: E) this note may have been printed on an Acme Model 200 printer, but the probability cannot be estimated

We know from the third sentence that the Type A micropattern exists in 70% of all Acme Model 200 printers and in some other models of printers. However, we know neither how many other models nor what percentage of other models produce the Type A micropattern. Hence, the probability that the note was printed on the Acme Model 200 printer cannot be determined. For that reason, responses A, B, C, and D are incorrect because the probability is based only on the characteristic of the one model printer that we know, the Acme Model 200, and not on all of the printer models that contain the Type A micropattern.