

Introduction to Logic

How do we know that tomorrow sun rises in the east? How do we know that if we touch the fire it burns us? Eventhough there are scientifiic proves, mostly we argue based on our past experiences.

Let us take one example:

Proposition: Mr.X is driving a rolls royce car

Conclusion: so Mr.X is a rich person

You might argue that this argument is not valid because Mr.X can be driver or the car or may be it is a rented car. But If you are living in a developed country where Rolls Royce cars can be seen every where, you are most likely to agree that Mr.X is a rich person as he is driving the Rolls royce.

This reasoning is called Inductive reasoning or probability. This reasoning is proposed by David Hume. He suggested that the people who won't agree with this type of reasoning must be starved to death as this is one of the most important way of convincing people and to draw valid conclusions.

Let us take another Argument:

Proposition: Sachin is a great batman

Conclusion: So India will win the match

Some of you again may not agree with the varacity of the conclusion but If I may add another proposition "Great batsman help teams to win matches" then this argument looks like below

Proposition: Sachin is a great batman

Proposition: Great batsman help teams to win matches

Conclusion: So India will win the match

Now this is more convincing. This type of reasoning is called Deductive reasoning. This is proposed by Aristotle. He studied 216 different structures of Deductive reasoning and found that only 16 structures give valid conclusions.

Let us look at a couple of the false arguments

1. Propositions are valid but conclusion is false

Proposition: If Bill Gates has Kohinoor diamond then He is rich

Proposition: Bill Gates does not have Kohinoor

Conclusion: So he is not rich

We know this is a false conclusion, even though both the propositions are true

2. Propositions are false but conclusion is true

Proposition: All Rats are CATs

Proposition: All CAT are Dogs

Conclusion: All Rats are Dogs

Clearly both the propositions are false but given the propositions true, the conclusion is true.

We will see lot of arguments in our daily life. These arguments range from convincing our friend to make him watch your favorite hero movie to whether Telangana state has to be given or not. Critical reasoning is the use of logic to evaluate arguments.

Logic is defined as the study of methods and principles used to distinguish good (correct) reasoning from bad (incorrect) reasoning. Let us have a look at some technical terms

Argument:

An argument is a group of statements (propositions) where the statements follow one another and ultimately give a final statement known as the conclusion or inference. The group of all these statements including the conclusion is known as an argument.

Most questions in Logical reasoning are based on whether the student is capable of testing the validity of an Argument, the first thing one has to clearly understand is the concept of the Argument. For the purposes of understanding the concept of the Argument fully, it would help to get acquainted with a few key terms.

Elements of an Argument:

Proposition: A proposition is the basic units of an argument. A typical proposition has a relationship spelled out between a subject and an object in the form a sentence.

Illustration: of Proposition

Eg: All Andhrites are Indians

Here "Andhrites" is the subject and "Indians" is predicate

Premise: The term premise is applied to the proposition that gives rise to the conclusion or the inference. Unless the premise is valid, the conclusion will not be valid.

Conclusion or inference: The conclusion or inference of an argument is the final proposition that is affirmed on the basis of other propositions of the same argument.

Argument = Proposition 1 (Premise) + Proposition 2 (Premise) + Proposition 3 (Conclusion)

Eg: All Students are good

Rama is a student

Rama is good

Types of arguments:

Deductive argument: A deductive argument is one whose conclusion is claimed to follow from its premises with absolute necessity or certainty, this certainty not being a matter of degree and not depending in any way on anything else. Therefore a deductive argument has to be either valid or invalid. There is no grey area in between.

In competitive exams questions on this area comes under the header "*syllogisms or Statements and conclusions*"

Inductive Argument: An inductive argument is one whose conclusion is claimed to follow from its premises only with probability, Inductive arguments, therefore, cannot be absolutely valid or invalid, the way deductive arguments are. But most of the arguments we make in our life are based on inductive reasoning. We may not convince others purely based on deduction, but by giving some past examples.

In most of the competitive exams questions on this area comes under the header "*Critical reasoning*".