Unit 7.4

# Other forms of Immediate Inferences

## What is an Inference?

Inference is a network of propositions in which the preceding proposition(s) known as premise implies the conclusion. It is a necessary connection between premise and conclusion. The truth or falsity of the former implies the truth and falsity of the latter. An inference may have one premise or more than one premise. If an inference has just one premise and the conclusion is drawn from that very premise, it is called immediate inference and where there are more than one premise, it is called mediate inference.

## Immediate inference

These are two types of immediate inference:

i. Square of opposition

ii. Eduction

## Eduction

In 'Square of Opposition' the premise and the conclusion differ in quantity or in quality or both quantity and quality. But in eduction the meaning of the premise and meaning of the conclusion may remain the same. In that case they are called equivalent propositions. The premise and the conclusion differ only in form. This chapter deals with different types of education. Eduction is of four types:

1. Conversion
2. Obversion
3. Contraposition
4. Inversion

## Conversion

Conversion is a form of immediate deductive inference (i) where the subject of the conclusion is predicate of the premise and the predicate of the conclusion is the subject of the premise (ii) the qualities of the premise and the conclusion remain the same (iii) The quantities of the premise and the conclusion should be same as far as possible (iv) the term which is distributed in the conclusion should be distributed in the premise. This we call law of distribution.

Application of these rules leads to the following:

| | Premise | | Conclusion |
|---|---|---|---|
| A | All S is P | I | Some P is S (by limitation) |
| E | No S is P | E | No P is S |
| I | Some S is P | I | Some P is S |
| O | Some S is not P | Not valid | |

(A) The converse of A is I. It could not be A, because in that case 'P' which is distributed in the conclusion cannot be distributed in the premise. This breaks the law of distribution. A then is converted to I. Thus converse of A is not its equivalent but its complement. This form of conversion is called conversion by limitation. The conversion of "All men are mortal" is "Some mortals are men".

(E) The conversion of "No beasts are rational beings" is

"No rational beings are beasts".

(I) The conversion of "Some cats are black" is

"Some black beings are cats".

(O) cannot be converted. 'Some S is not P" if converted will be like "Some P is not S". But this is invalid because 'S' which is distributed in the conclusion is not distributed in the premise. This violates the law of distribution. Hence there is no valid conversion for O

## Obversion

Obversion is a form of immediate deductive inference where (i) the predicate of the conclusion is the contradictory of the predicate of the premise. The subject of the premise and of the conclusion is same (ii) In this form of inference the quality of conclusion is opposite to the quality of premise. (iii) The quantity of premise and conclusion is same. (iv)The law of distribution should be obeyed.

Application of these rules leads to the following:

| | Premise | | Conclusion |
|---|---|---|---|
| A | All S is P | E | No S is non- P |
| E | No S is P | A | All S is non- P |
| I | Some S is P | O | Some S is not non- P |
| O | Some S is not P | I | Some S is non -P |

## Contraposition and Inversion

Conversion and obversion are the two original forms of eduction. Other forms of eduction like contraposition and inversion may be obtained by successively converting and obverting in either order.

## Contraposition

Contraposition is that form of immediate inference where the contradictory of the original predicate is the subject of the conclusion and the contradictory of the original subject is the predicate of the conclusion. Contraposition of A, E and O proposition is given below:

| | | | |
|---|---|---|---|
| (i) | A | All S is P | Given proposition |
| | E | No S is non P | by obversion |
| | E | No non P is S | by conversion (this is partial contraposition) |
| | A | All non P is non S | by obversion (this is complete contraposition) |

| | | | |
|---|---|---|---|
| (ii) | E | No S is P | Given proposition |
| | A | All S is non P | by obversion |
| | I | Some non P is S | by conversion (This is partial contraposition) |
| | O | Some non P is not non S | by obversion (this is complete contraposition) (But it is called contraposition by limitation) |

| | | | |
|---|---|---|---|
| (iii) | I | Some S is P | Given proposition |
| | | Some S is not non P | by obversion |

Since O proposition can not be converted, so contraposition of I proposition is not possible.

| | | | |
|---|---|---|---|
| (iv) | O | Some S is not P | Given proposition |
| | | Some S is non -P | by obversion |
| | | Some non P is S | by conversion (partial contraposition) |
| | | Some non P is not non S | by obversion (complete contraposition) |

Inversion :

Inversion is yet another form of eduction. This again is combination of conversion and obversion. In inversion subject of the conclusion is contradictory of original subject and predicate of the conclusion is contradictory of the original predicate. Inversion of A, E, I and O propositions is given below:

| | | |
|---|---|---|
| A | All S is P | Given proposition |
| | No S is non - P | obversion |
| | No non - P is S | conversion |
| | All non - P is non - S | obversion |
| | Some non - S is non - P | conversion |

The inversion of A into I is called inversion by limitation.

| | | |
|---|---|---|
| E | No S is P | Given proposition |
| | No P is S | by conversion |
| | All P is non S | by obversion |
| | Some non S is P | by conversion (This is partial inversion) |

Some non S is not non P by obversion (This is complete inversion)

E is inverted in O. This is inversion by limitation.

| | | |
|---|---|---|
| I | Some S is P | Given proposition |
| | Some P is S | By conversion |
| | Some P is not non S | by obversion |

Since O proposition cannot be converted, so there is no inversion for I proposition. Even if we start with obversion, then also we are stuck as we have seen in the case of contraposition.

O Some S is not P

Since O proposition cannot be converted hence there is no inversion of O proposition also. Alternatively even if we start with obversion, then also we are stuck as we have seen in the case of the contraposition of O proposition.

## Questions

1. Give converse, obverse, contrapositives (partial and complete) and inverse of the following propositions:
   a. Some roses not red things.
   b. All cats are mammals.
   c. No lion is black creature.
   d. Every voter is a citizen.
   e. Some educated persons are sinners.
   f. All successful people are hard working persons.
   g. Some scientists are women.
   h. All logicians are mathematicians.
   i. Some women are not literate.
   j. No fish is mammal.
   k. All students of this class are healthy children.
   l. Some boys are good football players.
   m. No saint is a cheater.
   n. Some writers are not scholars.
   o. All men are mortal.
   p. Some women are doctors.
   q. No circle is square.
   r. Some men are six feet tall.
   s. Some fruits are not sweet.
   t. All snakes are reptiles.
2. Explain the notion of an inference in logic. Discuss different types of inferences.
3. Point out the differences between immediate inferences and mediate inference.
4. Explain different types of immediate inferences.
5. Discuss rules of conversion as a form of immediate inference. Also examine conversion of E and I propositions.
6. Why O proposition cannot be converted? Give precise reason.
7. Why A proposition cannot be converted into A itself? Give an exact answer.
8. Contraposition is not independent form of inference. Explain citing examples.
9. Inversion of I and O propositions are not possible. Give reasons.
10. Briefly discuss the difference between Square of Opposition and Eduction.