CONTENTS

~~NATIONAL SCHOOL OF BANKING~~

LOGICAL REASONING MADE SIMPLE

SYLLOGISMS

Syllogism or the 'mediate argument' is a deductive argument containing two premises on the basis of which the inference/conclusion is to be drawn. The meaning of the word 'syllogism' is to 'reason'. A syllogism is composed of propositions, which in turn are composed of terms. Premise is a statement used in an argument that purports to provide evidence, or give a reason for the acceptance of another statement called a conclusion.

A syllogism has numerically six terms. But in fact, there are three terms, each occurring twice.

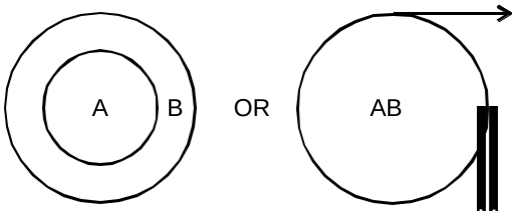
In its traditional concept, the premises (or statements) are selected from four basic types of statements.

The universal affirmative statement	:	All A are B (symbolised by 'A').
The universal negative statement	:	No A is B (symbolised by 'E').
The particular affirmative statement	:	Some A are B (symbolised by 'I').
The particular negative statement	:	Some A are not B (symbolised by 'O').

Let us draw all the possible diagrams to represent these statements. All the given diagrams obey the statement. But the diagram labelled Basic diagram shows minimum cutting or encroachment. So, for each type of statement, the diagram labelled Basic diagram should always be drawn.

The universal affirmative statement : All A are B (symbolised by 'A')

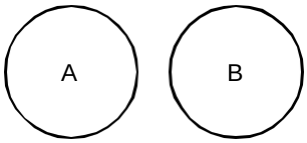
There are are two possible diagrams by which this type of statement can be represented.



Basic diagram

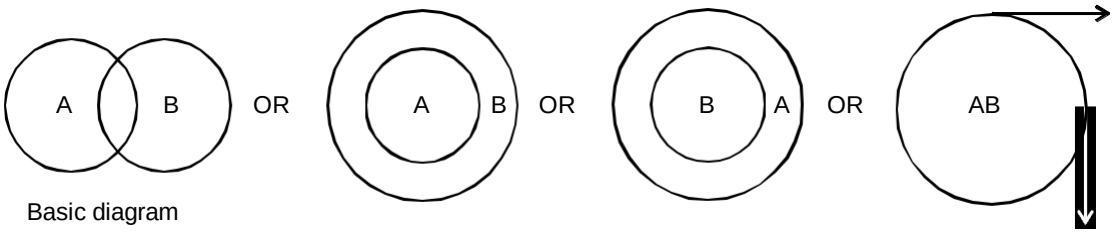
The universal negative statement: No A is B (symbolised by 'E')

There is only one possible diagram to represent this statement.



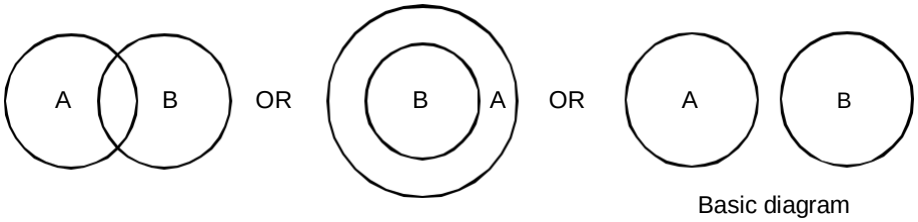
Basic diagram

The particular affirmative statement: Some A are B (symbolised by 'I')



Basic diagram

The particular negative statement: Some A are not B (symbolised by 'O')



Basic diagram

The types of statements that occur in any particular syllogism specify its mood.

e.g. : Some of the students are punctual.

None of the students are regular.

Therefore, some of the regulars are not punctual. It is a syllogism in the 'IEO' mood. Since each of the three statements in a syllogism can be A, E, I or O, there are 64 possible moods. The conclusion is generally analysed into subject and predicate (S-P), and these terms must be related by a middle term 'M' which occurs in both the premises. The traditional analysis recognises that the order of the two premises is logically immaterial.

Questions on syllogism that appear in competitive examinations can be solved by any one of the following three methods.

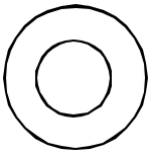
1) Venn Diagrams
2) Rules of Syllogism
3) Euler Diagrams

The answer for the same question varies, depending on the method used. Here we will discuss the Venn diagram method in detail.

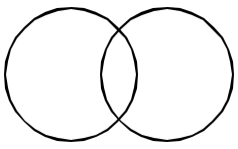
One of the methods to solve these types of questions is to draw diagrams for all probable situations and then reach out for a fool-proof answer. To put it in other words, if we have to conclude that a particular given conclusion follows, then it should follow in all probable diagrams. Even if it does not follow in one probable diagram, then our conclusion should be - "does not follow".

<u>Short cut method for positive conclusions</u> :-

There is one method known as "Method of minimum cutting or encroachment". The method says that we try not to cut or encroach some other circle as far as possible. Cutting does not mean only physical cutting. Cutting means encroaching upon the space. That is,



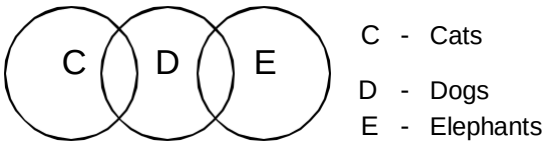
The above diagram is a bigger cutting compared to the diagram appearing below.



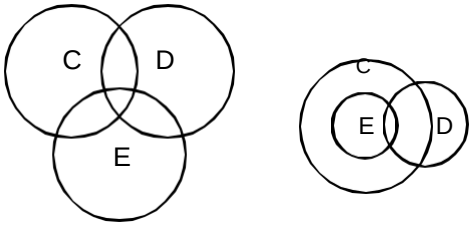
Thus, as per this method, to take an example, if the statements are :-

Statement 1 : Some cats are dogs.
Statement 2 : Some dogs are elephants.

We cannot avoid cutting/encroaching cats and dogs circles. We cannot avoid cutting/encroaching dogs and elephants circles. But, we can certainly avoid cutting cats and elephants or encroaching the space of cats by elephants. Thus, the diagram obtained by following the 'Method of minimum cutting' is -



Thus, though two other diagrams given below are probable diagrams, we do not need to draw them to decide on positive conclusions. (For negative conclusions, drawing such diagrams may be necessary).



For positive conclusions (i.e. conclusions with the qualifier 'Some' and 'All' without any negative word like 'not'), we need not draw all probable diagrams. We can just draw one diagram i.e. the diagram obtained by the method of minimum cutting/encroachment. If the conclusion follows in that diagram, it follows in all other probable diagrams. We need not check it up. We can just say "follows". If it does not follow in the diagram obtained by applying the method of minimum cutting/ encroachm\iagram.

Negative conclusions :- Whenever we come across negative conclusions, see whether the conclusion follows in the diagram drawn, based on the Method of Minimum Cutting. If it does not follow, say it "does not follow" and proceed to the next conclusion. However, if it follows, do not decide the answer as "follows". Draw the other probable diagram. If it follows in this diagram, draw the next probable diagram till all probable diagrams are exhausted. If it follows in all the diagrams, then only say "follows". Otherwise, at whatever stage you get a diagram where it does not follow, you say "does not follow" and proceed to the next conclusion.

Thus, you will have to arrive at a fool-proof answer in order to say "follows", in case of negative conclusions.

Answer "either" :-

If we have to say either 1 or 2 follows, it means, when 1 follows, 2 does not follow, while at the same time, when 2 follows, 1 does not follow. It is represented as

1 :
2 :

This entire combination is called “either 1 or 2 follows”.

When to look for the possibility of answer “either” :-

There is a possibility of answer “either” only when there are two contradictory conclusions. Examples of contradictory conclusions are :-

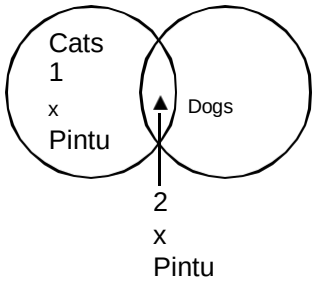
Conclusion 1 : Pintu is cat.
Conclusion 2 : Pintu is not cat.

Another example of contradictory conclusion is,

Conclusion 1 : Some cats are dogs.
Conclusion 2 : No cat is dog.

Example to illustrate answer “either” :-

Statement 1 : Some cats are dogs.
Statement 2 : Pintu is cat.
Conclusion 1 : Pintu is dog.
Conclusion 2 : Pintu is not dog.



Since Pintu is dog and Pintu is not dog are contradictory conclusions, we should look for possibility of answer “either”. As shown in the diagram, Pintu can be either at Position 1 or Position 2.

Conclusion	**Considering Pintu at position 1**	**Considering Pintu at position 2**
Pintu is dog	Does not follow ( ) (outside dog circle)	Follows ( )
Pintu is not dog	Follows ( ) (outside dog circle)	Does not follow ( )

Thus answer is ‘Either (1) or (2) follows.’

The above information can be summarised as follows :-

To solve syllogism questions, remember the following points :-

1) Check conclusions, irrespective of the nature of statements.
2) If one of the conclusions is negative, draw one diagram of minimum and one diagram of maximum encroachment. Of course, sometimes we may to need to draw all the possible diagrams.
3) Check the conclusions for a possibility of ‘either or’ answer options (check the subjects).
4) Sometimes, ‘either or’ option is possible but in a question, the right answer is ‘None of these’.

5) A positive conclusion 'follows' when it follows in minimum and maximum encroachment diagrams. i.e. generally what 'follows' in minimum encroachment 'follows' in maximum encroachment as well.

6) If a negative conclusion follows in minimum encroachment, check if it follows in other diagrams also. If it follows in them also, only then declare it as 'follows'.
7) If negative conclusion does not follow in one diagram (e.g. minimum encroachment) even if it follows in maximum encroachment, we can safely declare it as 'does not follow'.

Illustrative Questions

Directions (Q.Nos.1-5) :- In each question below are given three statements, followed by four conclusions numbered (I), (II), (III) and (IV). You have to take the given statements to be true, even if they seem to be at variance from commonly-known facts and then decide which of the given conclusions logically follow(s) from the given statements, disregarding commonly-known facts.

1. **Statements** :-

(I) All sunnys are trains.
(II) All trains are poles.
(III) No pole is bike.

Conclusions :-

(I) Some poles are cars.
(II) No bike is sunny.
(III) Some trains are sunnys.
(IV) Some bikes are poles.

(1) Only (II) and (III) follow
(2) Only (IV) follows
(3) Only (I), (II) and (III) follow
(4) All follow
(5) None follows

2. **Statements** :-

(I) All towns are villages.
(II) Some villages are cities.
(III) No city is state.

Conclusions :-

(I) Some cities are towns.
(II) Some villages are states.
(III) No city is town.
(IV) Some villages are not cities.

(1) Only (I), (III) and (IV) follow
(2) Only (II) follows
(3) Only (I) and (IV) follow
(4) All follow
(5) None of these

3. **Statements** :-

(I) All post-cards are envelopes.
(II) Some post-cards are inlands.
(III) No inland is stamp.