Syllogisms or Statements and Conclusions

A syllogism question contains 2 or more Question statements, and 2 or more conclusions followed by 4 options.

Statement 1: - - - -

Statement 2: - - - -

Conclusion 1: - - - -

Conclusion 2: - - - -

Answers options:

Option 1: If only conclusion 1 can be drawn from the given statements.

Option 2: If only conclusion 2 can be drawn from the given statements.

Option 3: If both conclusions 1 and 2 can be drawn from the given statements.

Option 4: None of the conclusions can be drawn from the given statements.

Example Question:

Statements:

All MBAs are Graduates

All graduates are Students

Conclusions:

1: All MBAs are Students

2: Some students are MBAs

There are two types of Conclusions:

1. Immediate Inferences

2. Logical Conclusions.

Immediate inferences are the conclusion which are drawn from only one statement. For example, From the statement All A's are B's, we can draw some A's are B's, Some B's are A's. These are easy to draw.

For Logical conclusions you have to follow complete theory.

Understanding Syllogism question:

Questions on syllogisms contains only the following 4 types of statements:

1. The universal positive : Eg: All $\overset{\surd}{X}$ are $\overset{\times}{Y}$

2. The universal negative : Eg: No $\overset{\surd}{X}$ is $\overset{\surd}{Y}$

3. The particular positive: Eg: Some $\overset{\times}{X}$ are $\overset{\times}{Y}$

4. The particular negative : Eg: Some $\overset{\times}{X}$ are not $\overset{\surd}{Y}$'s

Here Checkmark ($\surd$) indicates "Distribution". If a term is distributed means It covers each and every element of it. All X are Ys means X $\in$ Y, But Y need not be a subset of X. So Y does not have check mark.

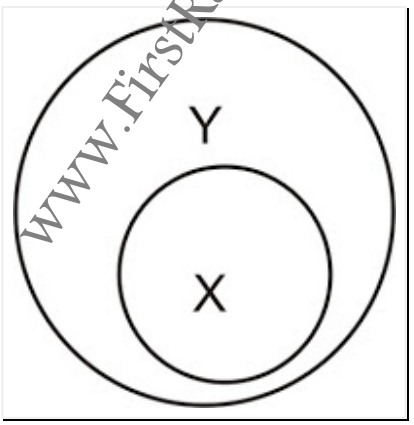
You should commit to memory, how to put $\surd$ marks and $\times$ marks and to distinguish positive and negative statements, universal and particular statements.

Here two statements are universal (1 and 2), and two statements are particular (3 and 4).
Two statements are positive (1 and 3) and two statements are negative (2 and 4).

I. The Universal Positive: All $\overset{\surd}{X}$ are $\overset{\times}{Y}$

It states that every member of the first class is also a member of the second class. Take a statement "All Tamilians are Indians". It does not necessarily follows All Indians are Tamilians. So Indians is not distributed on Tamilians.

The general diagram for Universal Affirmative 'All $\overset{\surd}{X}$ are $\overset{\times}{Y}$' is



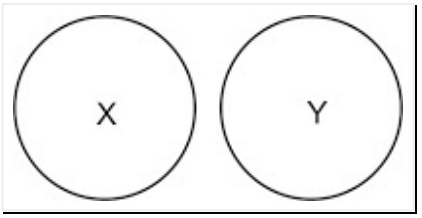
Immediate inference:

1. Some $\overset{\times}{X}$ are $\overset{\times}{Y}$
2. Some $\overset{\times}{Y}$ are $\overset{\times}{X}$

II. The universal Negative: No $\overset{\surd}{X}$ is $\overset{\surd}{Y}$

It states that no member of the first class is a member of the second class. This proposition takes the form - No X is Y.

The general diagram for Universal Negative 'No X is Y' is

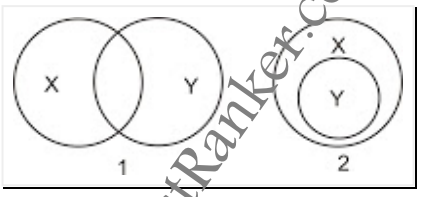


Immediate Inferences:

1. No $\overset{\surd}{Y}$ is $\overset{\surd}{X}$
2. Some $\overset{\times}{X}$ are not $\overset{\surd}{Y}$'s,
3. Some $\overset{\times}{Y}$ are not $\overset{\surd}{X}$'s

III. The Particular Affirmative: Some $\overset{\times}{X}$ are $\overset{\times}{Y}$

It states that *at least one member*, but never all, of the term designated by the class 'X' is also a member of the class designated by the term 'Y'. This proposition takes the form Some Xs are Ys. This possible diagrams as shown by the Euler's circles for this proposition are:

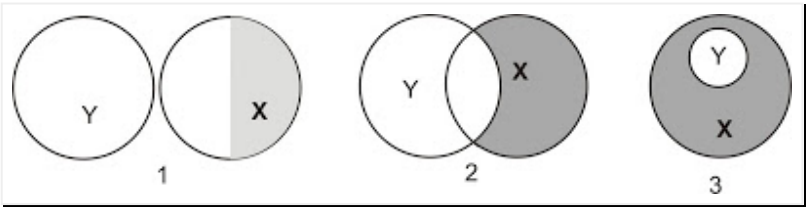


Immediate Inferences:

Some $\overset{\times}{Y}$ are $\overset{\times}{X}$

IV. The particular Negative: Some $\overset{\times}{X}$ are not $\overset{\surd}{Y}$'s.

It states that at least one member of the class designated by the term 'X' is excluded from the whole of the class designated by the term 'Y'. This proposition takes the form Some Xs are not Ys. The Euler's circle diagrams for this proposition are as follows.



Immediate Inferences: None

The shaded portion in each is that part of X that is not Y.

Most of the students get some doubt why "Y" is distributed here. Here is the explanation. Suppose take an

example statement "Some students are not hardworking". This can be phrased as All the hardworking students are not some students". Or let us say, Rama is one of the student who is not hardworking. So not even a single hardworking student cannot be Rama. So All hardworking students cannot be Rama.

Read this article for more information: Click Here

How to answer Syllogisms:

There are two methods to answer syllogisms.

1. Euler venn diagram method
2. Aristotle's rules Method

If all the statements are Universal you can easily draw venn diagrams and solve the questions. But If there are more particular statements, then you better learn Aristotle method. But Aristotle's method initially seems to be a bit difficult to understand, as one practices good number of questions, one can easily crack these questions.

Aristotle's Rules to solve syllogisms:

1. If both the statements are particular, no conclusion possible

(Explanation: Statements starting with "Some" are particular)

2. If both the statements are negative, no conclusion possible
3. If both the statements are positive, conclusion must be positive
4. If one statement is particular, conclusion must be particular
5. If one statement is negative, conclusion must be negative
6. Middle term must be distributed in atleast one of the premises

(Explanation: Middle term is the common term between two given premises, and A terms is distributed means it must have the "✓" mark above it)

7. If a term is distributed in the conclusion, the term must be distributed in atleast one of the premises.

(Explanation: If any term is having star mark in the conclusion, it term must have star mark in the given premises)

8. If a term is distributed in both the statements only particular conclusion possible.

Solved Example 1:

Statements:

All MBAs are Graduates

All graduates are Students

Conclusions:

1: All MBAs are Students

2: Some students are MBAs

Explanation:

Statement 1: All $\overset{\surd}{\text{MBA}}$s are $\overset{\times}{\text{Graduates}}$

Statement 2: All $\overset{\surd}{\text{Graduates}}$ are $\overset{\times}{\text{Students}}$

C1: All MBA(√) are students(×)

C2: Some Students(×) are MBA(×)

Now Let us apply rules:

1. Both statements are positive, conclusion must be positive

2. Common term is Graduate and it has check mark in the second statement

Conclusion 1: MBA in the conclusion has got a check mark so it must have check mark in atleast one of the premises. MBA in S1 has got star mark. It satisfied all the rules. It is valid conclusion

Conclusion 2: No term in the conclusion has got a check mark so no need to check anything. It followed all the rules. This statement is a valid conclusion.

Solved Example 2:

Statements:

All Cats are Dogs

No Dog is Fish

Conclusions:

1. No Cat is Fish

2. Some Cats are Fish

Explanation:

S1: All Cats(√) are Dogs(χ)

S2: No Dog(√) is Fish(√)

C1: No Cat(√) is Fish(√)

C2: Some Cats(χ) are Fish(χ)

Now Let us apply rules:

1. S2 is negative, so conclusion must be negative. So C2 is ruled out, as rule says that one statement is negative conclusion must be negative.

2. Common terms is Dog and it has check mark in both the premises

Conclusion 1: In the conclusion, both the terms Cat, Fish have check marks and These two terms have check marks in at least one of the premises. So Conclusion 1 is valid

Conclusion 2: As one of the premises is negative, conclusion must be negative. So this conclusion is not valid

Solved Example 3:

Statements:

Some books are toys.

No toy is red.

Conclusions:

1. Some toys are books.

2. Some books are not red.

Explanation:

S1: Some $\overset{\chi}{\text{Books}}$ are $\overset{\chi}{\text{Toys}}$

S2: No $\overset{\surd}{\text{Toy}}$ is $\overset{\surd}{\text{Red}}$

C1: Some $\overset{\chi}{\text{Toys}}$ are $\overset{\chi}{\text{Books}}$

C2: Some $\overset{\chi}{\text{Books}}$ are not $\overset{\chi}{\text{Red}}$

We can easily draw conclusion one as it is a direct inference from Statement 1.

Now by applying the rules,

Statement 2 is negative so conclusion must be negative. and middle term "Toy" should have a √ mark. It has √ mark in statement 2. Now If a term has a √ mark in the conclusion it should have √ mark in atleast one of the statements. Here "red" has √ mark in the conclusion and also has √ mark in statement 2.

So Statement 2 also following all the rules.

Both conclusions are valid.

Three Statement Types:

We can apply all the rules we learnt above while solving 3 statement questions too. Look at the options and see from which two statements those words are derived. If Once word is from first and another is from the third, we have to check that there are two middle terms with ✓.

Solved Example 4:

Statements:

All cats are dogs

some pigs are cats.

All dogs are tigers

Conclusions:

some tigers are cats

some pigs are tigers

all cats are tigers

some cats are not tigers

Answer options:

1. Only 1 and 2

2. Only 1, 2 and 3

3. All follow

4. None Follow

Explanation:

Let us rearrange for easy understanding.

S2: Some $\overset{\chi}{\text{Pigs}}$ are $\overset{\chi}{\text{Cats}}$

S1: All $\overset{\surd}{\text{Cats}}$ are $\overset{\chi}{\text{Dogs}}$

S3: All $\overset{\surd}{\text{Dogs}}$ are $\overset{\chi}{\text{Tigers}}$

C1: Some Tigers$^{\chi}$ are Cats$^{\chi}$

C2: Some Pigs$^{\chi}$ are Tigers$^{\chi}$

C3: All Cats$^{\surd}$ are Tigers$^{\chi}$

C4: Some Cats$^{\chi}$ are not Tigers$^{\chi}$

From statements 1 and 3, All Cats are Tigers is correct as dogs has √ mark. So conclusion 3 is correct. Also from the above, Some tigers are cats is also true. So conclusion 1 is correct.

Pigs is from 2nd statement and tigers is from third statements. If you observed our rearraged statements, In the second and first statements Cats has √ markand first and third statements has dogs has √ mark. So we can conclude that Some Pigs are tigers.

All the given statements are positive so conclusion should be positive. So option 4 is not correct.

Correct Answer option is 2.