CODED INEQUALITIES

To solve coded inequality problems quickly, focus on identifying common symbols and understanding the relationships between them, rather than directly translating the symbols into standard inequalities.

Here's a breakdown of the shortcut tricks:

1. Understand the Code:

Direct Relationships:

Pay close attention to how the coded symbols represent standard inequality signs (>, <, =, ≥, ≤).

Indirect Relationships:

Some codes might indicate "not smaller than" (≥), "neither greater than nor smaller than" (=), etc.

Create a Table:

Organize the coded symbols and their corresponding meanings in a table for easy reference.

2. Identify Common Symbols:

Look for Direct Connections:

If you can find a direct connection between the elements using the same coded symbol, that's your answer.

Example:

If you have "A @ B" and "B % C" and "@" means "greater than or equal to" and "%" means "greater than", then "A" is greater than or equal to "B" and "B" is greater than "C". Therefore, "A" is greater than "C".

Look for Opposite Symbols:

If you encounter opposite symbols (e.g., ">" and "<"), the relationship is ambiguous, and you might need to consider "either/or" scenarios.

3. "Either/Or" Cases:

Identify Opposite Symbols:

If you have two conclusions that are opposite (e.g., one says "A > B" and the other says "A < B"), check if the original coded statements allow for both possibilities.

Check for Equality:

If the original statements allow for equality (e.g., "A ≥ B" and "A ≤ B"), then the "either/or" case might be true.

4. Practice and Memorization:

Solve Many Problems:

The more you practice, the faster you'll become at recognizing patterns and applying the shortcuts.

Memorize Common Combinations:

Familiarize yourself with common combinations of coded symbols and their implications.

Example:

Let's say:

- "A $ B" means "A is not smaller than B" (A ≥ B)
- "A * B" means "A is neither greater than nor smaller than B" (A = B)
- "A # B" means "A is neither greater than nor equal to B" (A < B)

Question: If "P $ Q" and "Q # R", what can you conclude about P and R?

Solution:

1. **Translate:** P ≥ Q and Q < R
2. **Analyze:** Since P ≥ Q and Q < R, we can't directly compare P and R.
3. **Consider "Either/Or":** The relationship between P and R could be either P > R or P = R.
4. **Conclusion:** The correct answer would be "either P > R or P = R".

What is Inequality?

As mentioned above, Inequality refers to expressions that contain inequality signs such as <, >, =, etc. To understand the questions based on mathematical inequalities, candidates must know about various signs, which are used in such types of questions. The same is given below:

Symbol	Meaning
A > B	A is greater than B
A < B	A is less than B
A = B	A is equal to B
A ≥ B	A is either greater than or equal to B
A ≤ B	A is either less than or equal to B
A ≠ B	A is either greater than or less than B

Types of Inequality

As now we know what consists of the questions related to the Inequality reasoning section. Let us see the various types of questions that may come one by one from below:

1. Basic Inequality

In these type of Inequality reasoning questions, expressions consisting of comparison between different elements will be given and a defined relation between any 2 elements will be asked.

2. Either – or Case

In these type of Inequality reasoning questions, a definite relation between two elements cannot be determined. In this type of question there will be given 2 relations only from which either relation 1 or 2 can be true.

3. Coded Inequality

In these type of Inequality reasoning questions, codes will be assigned to inequality symbols and the expression will be given using those codes. Candidates need to decode the symbols and find the relation between the elements.

How to Solve Inequality Reasoning Questions – Tips and Tricks

Candidates can find various tips and inequality reasoning tricks from below for solving the questions related to the Inequality reasoning section.

Tip # 1: Candidates can consider the symbols by trick to find the answers quickly such as > as Father, ≥ as Mother, = as Servant, the priority for solving any questions will be given on the basis of seniority such as Father is senior than Mother and Mother is senior than Servant, and so on.

Tip # 2: Some of the rules for Basic Inequalities are as follows.

Statement	Conclusion
P > Q >R	P > R
P > Q ≥ R	
P ≥ Q > R	
P = Q > R	
P > Q = R	
P < Q < R	P < R
P < Q ≤ R	
P ≤ Q < R	
P = Q < R	
P < Q = R	
P ≥ Q ≥ R	P > R or P = R
P = Q ≥ R	
P ≥ Q = R	
P ≤ Q ≤ R	P < R or P = R
P = Q ≤ R	
P ≤ Q = R	
P < Q > R	No conclusion can be inferred
P ≤ Q > R	
P < Q ≥ R	
P > Q < R	
P > Q ≤ R	
P ≥ Q < R	

Tip # 3: Candidates need to follow the below mentioned rules for solving the either or case inequalities reasoning section:

Complementary Pair	Conditions
> + =	○ Elements in both conclusions should be the same.

< + = > + < + =	○ Both are individually false. ○ Combination of the relation should be true.
≤ + > > + ≤	○ Elements in all conclusions should be the same. ○ The relation between the elements in all the cases should be "can't say"

Inequality Sample Questions

Question 1: In the question, assuming the given statements to be true, find which of the conclusions among given two conclusions is/are definitely true, and then give your answer according to it.

Statement:

H < A < T = G > U ≥ V ≥ B

Conclusion:

I. T > B

II. G > H

(1) Only conclusion I follow

(2) Either conclusion I or II follow

(3) Only conclusion II follow

(4) None Follows

(5) Both conclusion I and II follow

Solution:

Given Statement: H < A < T = G > U ≥ V ≥ B

I. T > B = True (as T = G > U ≥ V ≥ B)

II. G > H = True (as H < A < T = G)

If we analyse the given statements, then we get the answer both conclusion I and II follows.

Question 2 : In the question, assuming the given statements to be true, find which of the conclusions among given two conclusions is/are definitely true, and then give your answer according to it.

Statement:

F > Y ≥ X < Z, C ≤ X < W

Conclusion:

I. Z > C

II. F > W

(1) Only conclusion I follow

(2) Either conclusion I or II follow

(3) Only conclusion II follow

(4) None Follows

(5) Both conclusion I and II follow

Solution:

Given Statement: F > Y ≥ X < Z, C ≤ X < W

On combining we will get F > Y ≥ X ≥ C and F > Y ≥ X < W

Conclusions:

I. Z > C = True (F > Y ≥ X ≥ C)

II. F > W = False (F > Y ≥ X < W, relationship between F and W cannot be determined.)

Hence, the only conclusion I follow.

Get more details on Input-Output Reasoning

Question 3 : In the question, assuming the given statements to be true, find which of the conclusions among given two conclusions is/are definitely true, and then give your answer according to it.

Statement:

B = K ≥ H = T > U ≤ I

Conclusion:

I. H > I

II. H ≤ I

(1) Only conclusion I follow

(2) Either conclusion I or II follow

(3) Only conclusion II follow

(4) None Follows

(5) Both conclusion I and II follow

Solution:

Given Statement: B = K ≥ H = T > U ≤ I

I. H > I = False (as H = T > U ≤ I)

II. H ≤ I = False (as H = T > U ≤ I)

Hence, Either conclusion I or II follows.

Check out Statement & Conclusion Reasoning

Question 4 : In the question, assuming the given statements to be true, find which of the conclusions among given two conclusions is/are definitely true, and then give your answer according to it.

Statement:

1. O < L > P > M ≤ N ≤ B

2. L = K, M ≥ R

Conclusion:

I. K > M

II. O = M

III. R < B

IV. R = B

(1) Only conclusion II follow

(2) Either conclusion I or III follow

(3) Only conclusion I and IV follow

(4) Either conclusion III or IV follow

(5) Only conclusion I and Either conclusion III or IV follow

Solution:

Given Statement:

1. O < L > P > M ≤ N ≤ B

2. L = K, M ≥ R

I. K > M = True (as L = K, so L replaced by K then K > P > M)

II. O = M = False (as O < L > P > M)

III. R < B = False (as M ≥ R then R ≤ M ≤ N ≤ B gives either R < B or R = B)

IV. R = B = False (as M ≥ R then R ≤ M ≤ N ≤ B gives either R < B or R = B)

Hence, Only conclusion I and Either Conclusion III or IV follow.

Question 5 : In the question, assuming the given statements to be true, find which of the conclusions among given two conclusions is/are definitely true, and then give your answer according to it.

Statement:

C = T ≥ V ≥ U

Conclusion:

I. C > U

II. T = U

(1) Only conclusion I follow

(2) Either conclusion I or II follow

(3) Only conclusion II follow

(4) None Follows

(5) Both conclusion I and II follow

Solution:

Given Statement: C = T ≥ V ≥ U

I. C > U = False (as C = T ≥ V ≥ U)

II. T = U = False (as T ≥ V ≥ U)

As we can see either I or II is true as we can see C = T, Hence it is the correct answer.

Also check out Missing Number Reasoning

Sample Inequality Reasoning Questions

Given below are sample inequality reasoning questions that will help improve your understanding:

Directions: In the following question assuming the given statements to be true, find which of the conclusion among given conclusions is/are definitely true and then give your answers accordingly.

Statement:

L > M > C ≥ Q < P = E < F

Conclusion:

1. L > Q
2. F > C

(1). Only I follow

(2). Only II follow

(3). Both I and II follow

(4). Either I or II follow

(5). Neither I nor II follows

Solution:

Given statement:

1. L > M > C ≥ Q < P = E < F
2. L > Q □ True (As L > M > C ≥ Q)
3. F > C □ False (As C ≥ Q < P = E < F)

Conclusion II is false as there is an inequality symbol change between Q and C.

Hence, **Only I follow.**

Directions: In the following question assuming the given statements to be true, find which of the conclusion among given conclusions is/are definitely true and then give your answers accordingly.

Statement:

$9 > 7 < 6 = 5 \geq 4$

Conclusion:

1. $9 > 5$
2. $6 > 4$

(1). Only I follow

(2). Only II follow

(3). Both I and II follow

(4). Either I or II follow

(5). Neither I nor II follows

Solution:

Given Statement:

1. $9 > 7 < 6 = 5 \geq 4$
2. $9 > 5$ ☐ False (As $9 > 7 < 6 = 5$)
3. $6 > 4$ ☐ True (As $6 = 5 \geq 4$)

Hence, **Only II follow.**

Directions: In the following question assuming the given statements to be true, find which of the conclusion among given conclusions is/are definitely true and then give your answers accordingly.

Statement:

$H > I < J = K$

Conclusion:

1. $H > J$
2. $J < H$
3. $I > K$

(1). Either I or II follow

(2). Only II follow

(3). Both I, II, and III follow

(4). Only I follow

(5). Neither I, II, nor III follow

Solution:

Statement:

1. H > I < J = K
2. H > J ☐ False (as H > I < J)
3. J < H ☐ False (as H > I < J)

III. I > K ☐ False (as I < J = K)

Here, J and H elements are the same but the meaning is different so they will not form a complementary pair.

Hence, **Neither I, II, nor III follow.**

Solved Examples on Inequality

As stated above also, the more a person practises, the more likely is that he/she may solve the questions correctly and more efficiently. Discussed below are a few questions on both direct and coded reasoning inequalities to simplify the concept even further for the candidates.

Directions (Q1-Q2): Answer the following questions based on the statement given below:

Statement: P < S < R < T > Q

Q 1. Which of the given conclusions is incorrect based on the given statement?

1. P < R
2. S < T
3. No relation between P & Q

4. No relation between P & T
5. P < T

Answer: (3) No relation between P & Q

Q 2. Which sign should be filled in the blank for the conclusion given below?

Conclusion: P ____T

1. >
2. <
3. =
4. ≤
5. ≥

Answer: (2) <; P<T

Directions (Q3-Q4): Based on the statements, answer the following questions.

'P * Z' means P is neither greater nor smaller than Z

'P # Z' means P is neither greater than nor equal to Z

'P & Z' means P is neither smaller than nor equal to Z

'P + Z' means P is not smaller than Z

'P % Z' means P is not greater than Z

Q 3. For the statement given below, which of the following options is correct?

Statement: A # C * F & R % T

1. A & C
2. F # T
3. C * R
4. A % T
5. C # F

Answer: (5) C # F

Solution:

Symbol	*	#	&	+	%
Sign	=	<	>	≥	≤

Statement: A # C * F & R % T

Conclusion: A < C = F > R ≤ T

A & C ↔ A > C

F # T ↔ F < T

C * R ↔ C = R

A % T ↔ A ≤ T

C # F ↔ C > R

And only C > R is correct based on the given equation

Q 4. To prove that A > B in the given statement, which code should be filled in the blank?

Statement: C & B _____F * E # A

1. #
2. *
3. &
4. +
5. %

Answer: (5) %

Solution:

Symbol	*	#	&	+	%

Sign	=	<	>	≥	≤

C & B _____F * E # A

When % is placed in the blank, the statement becomes,

C & B % F * E # A

⇒ C > B ≤ F = E < A, which proves that A > B

SYLLOGISM

Syllogism is a "Greek" word that means inference or deduction. As such inferences are based on logic, then there inferences that are called logical deduction. These deductions are based on propositions or premises. Different types of questions covered in this chapter are two, three or four statements along with multiple conclusions.

Various types of Syllogism based logical reasoning questions are being asked in different government examinations, which makes them the most important sections under the verbal reasoning section.

What is Syllogism?

Syllogism is a part of logical reasoning, especially analytical reasoning. It consists of some statements, and candidates need to derive conclusions from the given statements. The statements and conclusions may seem to be illogical, but while solving questions related to syllogism in reasoning, candidates must assume the given statements to be 100% true.

Syllogism reasoning questions check the basic aptitude and ability of a candidate to derive inferences from given statements using step-by-step methods of solving problems. Let us now understand the various types of Syllogism from below.

Types of Syllogism in Reasoning

As now we know what is Syllogism, let us see the various types of syllogism questions in the reasoning section below.

1. Basic Syllogism

In these type of syllogism reasoning questions, the conclusions must be 100% true. Conclusions which are 99% true will be considered as False.

2. Either – or Case

In these type of syllogism reasoning questions, when the conclusions are not 100% true but the two given conclusions are 50% true then the either-or case will be formed.

3. Coded Syllogism

In these types of syllogism reasoning questions, statements and conclusions are given in coded form.Candidates need to decode the statements and conclusions to find the answer.

4. Sequential Syllogism

In these type of syllogism reasoning questions, statements are given followed by the options. Candidates need to choose the set in which the third statement can be logically deduced from the first two statements.

How to Solve Syllogism Questions in Reasoning– Tips and Tricks

Candidates can find various tips and syllogism logical reasoning tricks from below for solving the questions in this section.

Tip # 1: If a definite conclusion is false in any of the possible diagrams, then the definite conclusion is considered to be false.

Tip # 2: If all statements are positive, then all negative conclusions will be false in definite cases and vice versa.

Tip # 3: Subject and Predicate can interchange for the complementary pair "Some + No"

Tip # 4: In a syllogism reasoning problem, if two conclusions have the same subject & predicate and consist of a complementary pair but only one of the conclusions is true, then it will not form an either-or case. Do not consider "Some + Some" as a complementary pair for Either or case.

Tip # 5: If a possible conclusion is true in any one of the possible diagrams, then the possibility is considered to be true.

Tip # 6: "Only a few" means both conclusions are definitely true.

Therefore, the conclusion, some A are B and some A are not B will be definitely true.

Tip # 7: In a syllogism reasoning problem, complementary pairs for Either or case are, "Some + N" and "All + Some not"

Tip # 8: Both conclusions should consist of one of the above complementary pairs. Subject and Predicate of the two conclusions should be the same and they cannot interchange. The answer of both the conclusions should be can't be said.

Tip # 9: Candidates need to keep the following things in mind while solving the syllogism based questions.

Get more insights on Order and Ranking

Statement	Definite Conclusion	Possible Conclusion
All A are B	○ All A are B ○ Some A are B . ○ Some B are A	○ All B are A ○ Some B are not A
Some A are B	○ Some A are B ○ Some B are A	○ All A are B ○ All B are A ○ Some A are not B ○ Some B are not A
Some A are not B	Some A are not B	○ Some A are B ○ No A is B ○ No B is A ○ Some B are not A ○ All B are A
No A is B	○ No A is B ○ No B is A	No possibility is true

Syllogism Sample Questions in Reasoning

Basic Syllogism:

Question 1:

Statements:

All roses are flowers.

Some flowers are red.

Conclusion:

I. Some roses are red.

II. All red things are roses.

Select the correct conclusion(s):

A) Only conclusion I

B) Only conclusion II

C) Both conclusions I and II

D) Neither conclusion I nor II

Answer:

A) Only conclusion I

Explanation:

Conclusion I is valid as it follows from the two statements (All roses are flowers, and some flowers are red). Conclusion II is not valid because we cannot infer that all red things are roses based on the given statements.

Question 2:

Statements:

All dogs are mammals.

Some mammals are carnivores.

Conclusion:

I. Some dogs are carnivores.
II. All carnivores are dogs.
Select the correct conclusion(s):
A) Only conclusion I
B) Only conclusion II
C) Both conclusions I and II
D) Neither conclusion I nor II
Answer:
D) Neither conclusion I nor II
Explanation:
Neither conclusion I nor II is valid based on the given statements. The first statement only establishes a relation between dogs and mammals, and the second statement establishes a relation between mammals and carnivores. We cannot directly relate dogs to carnivores based on the given information.

Either - or Case:
Question 3:
Statements:
All doctors are educated.
Some educated people are researchers.
Conclusion:
I. Some researchers are doctors.
II. Either some doctors are researchers, or all researchers are doctors.
Select the correct conclusion(s):
A) Only conclusion I
B) Only conclusion II
C) Both conclusions I and II
D) Neither conclusion I nor II
Answer:
B) Only conclusion II
Explanation:
Conclusion II is valid as it includes both possibilities based on the given statements. It covers the case where some doctors are researchers (as per the first conclusion) and also the possibility where all researchers are doctors (as per the second conclusion).

Question 4:
Statements:
All lions are fierce.
Some fierce animals are predators.
Conclusion:
I. Some lions are predators.
II. Either some predators are lions, or all lions are predators.
Select the correct conclusion(s):
A) Only conclusion I
B) Only conclusion II
C) Both conclusions I and II

D) Neither conclusion I nor II
Answer:
D) Neither conclusion I nor II
Explanation:
Neither conclusion I nor II is valid based on the given statements. The first statement establishes a relation between lions and being fierce, and the second statement establishes a relation between fierce animals and predators. We cannot directly relate lions to being predators based on the given information.

Coded Syllogism:
Question 5:
In a coded language, "pit na lo" means "red apple" and "lo pa re" means "juicy fruit." What does "re ki" stand for in the same coded language?
A) apple red
B) fruit juicy
C) juicy red
D) red fruit
Answer:
C) juicy red
Explanation:
From the given coded language, "re" stands for "juicy," and "ki" stands for "red." Therefore, "re ki" translates to "juicy red."

Question 6:
In a coded language, "so ta po" means "big blue sky" and "ta ma li" means "beautiful white flower." What does "ma li" stand for in the same coded language?
A) white flower
B) beautiful sky
C) big white
D) beautiful big
Answer:
A) white flower
Explanation:
From the given coded language, "ma" stands for "beautiful," and "li" stands for "flower." Therefore, "ma li" translates to "beautiful white flower."

Sequential Syllogism:
Question 7:
Arrange the following statements in a logical sequence:
I. All birds have wings.
II. Some birds are parrots.
III. All parrots can talk.
A) I, II, III
B) II, III, I
C) III, II, I
D) II, I, III

Answer:
A) I, II, III
Explanation:
The correct logical sequence is: All birds have wings (I) → Some birds are parrots (II) → All parrots can talk (III).

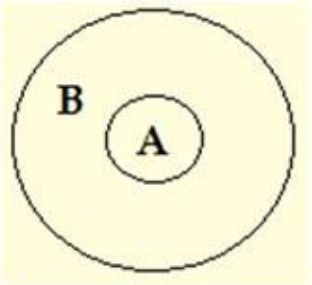
Question 8:
Arrange the following statements in a logical sequence:
I. All cars are vehicles.
II. Some vehicles are buses.
III. All buses are public transport.

A) II, I, III
B) III, II, I
C) I, III, II
D) I, II, III
Answer:
D) I, II, III
Explanation:
The correct logical sequence is: All cars are vehicles (I) → Some vehicles are buses (II) → All buses are public transport (III).
If you want more questions, check out the Syllogism Reasoning Questions.
Check out details on Venn Diagrams

Types of Syllogism Questions

1. All A are B

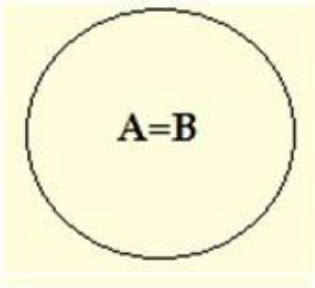
This phrase means that A is contained in B but not necessarily vice versa. This means A is a subset of B, but B may not be a subset of A. The Venn diagram for this is:



In this diagram, it is visible that circle A is inside the circle B, which means that B contains the entire A, i.e. All A are B.

2. A = B

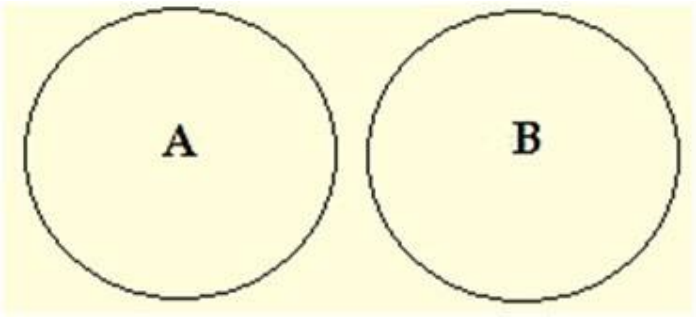
n this case, the conclusion is similar to the first type, i.e. "All A are B". Here not only "All A are B", but also "All B are A". This means A is a subset of B and B is also a subset of A. The Venn diagram is:



Here A is contained in B and so is B contained in A. So, here A contains all B and again B also contains all A.

3. No A are B

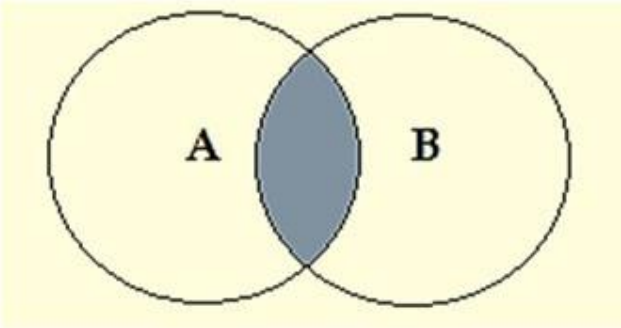
It is simply understandable that B does not contain any of A and so A is not contained in B. This means that A and B are disjoint sets. The Venn diagram for this case is:



Here no part of A is present inside of B and similarly, no part of A is present in A. So neither A nor B contain any part of B or A respectively.

4. Some A are B

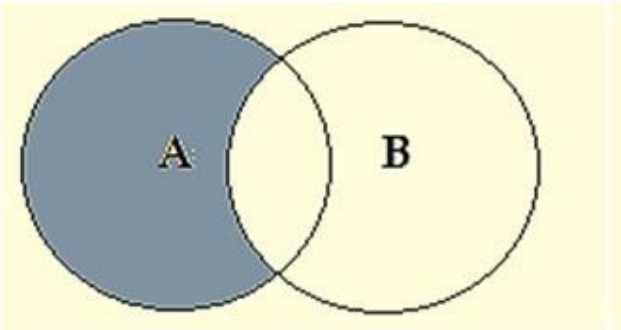
This is the case when some of A is in B that is A and B are intersecting, and thus some B are A will also be true. The Venn diagram depiction is as:



Here, the shaded portion indicates that some portion of A is contained in B while the unshaded portion is uncertain portion and does not indicate anything whether A is contained in B or not.

5. Some A are not B

This means that some portion of A is not included in B for sure while the other part of A is uncertain whether it is included in B or not. The Venn diagram is;



In this, some portion of A is surely not included in B while there is no surety whether the shaded region is included in B or not.

These are certain universal rules that should be followed while solving the syllogism questions. They are:

1. **Any "All" and "All" sentence will always imply an "All" conclusion.**
2. **Any "All' and "No" sentence will always imply a "No" conclusion.**
3. **Any 'All" and "Some" sentence will always imply a "No" conclusion.**
4. **Any "Some" and "All" sentence will always imply a "Some" conclusion.**
5. **Any "Some" and "No" sentence will always imply a "Some not' conclusion.**
6. **Any "Some" and "Some" sentence will always imply a "No" conclusion.**

Tips to solve the questions related to Syllogism:

1. **Read the question thoroughly**
2. **Start drawing the Venn diagram**
3. **Follow the sequence of the question while drawing**
4. **Analyse the conclusion from the Venn diagram**
5. **Check for other alternative solutions at the end**

Solved Example

Statements:

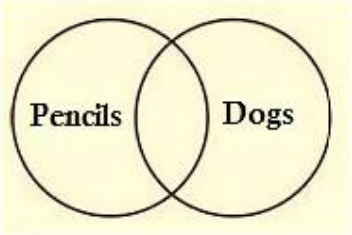
1. **Some pencils are dogs**
2. **All dogs are pens**
3. **All pens are cats**

Conclusions:

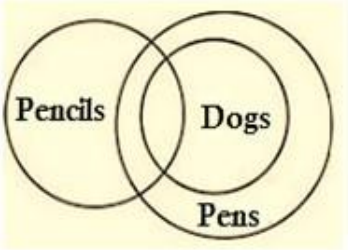
1. **All dogs are cats**
2. **Some pens are pencils**
3. **Some pencils are cats**

Solution:

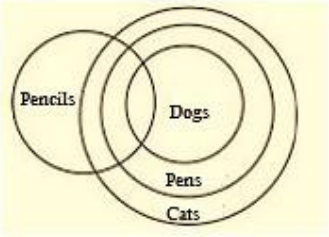
Analysing the first statement, the Venn diagram can be made as;



Now as per the second statement, all dogs are pens, we can draw the Venn diagram as:



Now as per the last statement which says that all pens are cats, we get



This is the total representation of the statements. Now the conclusion needs to be analysed one by one.

For the first conclusion, it is seen that the circle dogs is engulfed inside the circle cats. Thus the conclusion "all dogs are cats" is true.

For the second conclusion, the circles' pens and pencils intersect each other and hence, the conclusion "some pens are pencils" is also true.

For the third conclusion, the circles' cats and pencils also intersect each other and hence the conclusion "some pencils are cats" is also true.

Therefore, all the conclusion in this question is true.

In this way, the questions related to syllogism can be easily solved. The only thing that is important is to practice different variations of syllogism related questions and various bank exam questions so as to build up the confidence gradually.

Candidates willing to strengthen their command over this concept can solve more questions based on this topic at the Syllogism Questions page and apprehend the type of questions which may be asked and analyse their preparation.

Syllogism Tricks and Tips

Candidates can follow the below-mentioned syllogism tricks and tips that may help them solve sylloge questions easily:

1. **Always pay attention to words like 'some', 'a few', 'all', 'atleast', etc. These words form the base to solve the syllogism questions.**
2. **The best syllogism trick is to solve questions in the form of Venn diagrams. This will make the explanation more clear and simplified.**
3. **Never assume anything while solving the syllogism questions. The only data that has to be followed while solving the question is the data mentioned in the question. No extra assumption must be made while solving questions.**