Syllogism

INTRODUCTION

Syllogism is a Greek word that does mean 'inference' or 'deduction'. The problems of syllogism are based on two parts :
1. Proposition / Propositions
2. Conclusion / Conclusions drawn from given proposition/ propositions

WHAT IS A PROPOSITION?

Just consider the sentences given below:

(i) "All lions are pigs"

 Subject   Predicate

(ii) "No cat is rat"

 Subject   Predicate

(iii) "Some girls are beautiful"

 Subject   Predicate

(iv) "Some kites are not birds"

 Subject   Predicate

All the sentences mentioned above give a relation between subject and predicate. Here, it is clear from the sentences that a subject is the part of a sentence something is said about, while a predicate is the term in a sentence which is related to the subject.

Now, let us define the proposition :

A proposition is a sentence that makes a statement giving a relation between two terms. It has three parts :
(a) the subject
(b) the predicate
(c) the relation between subject and predicate

WHAT IS A CATEGORICAL PROPOSITION?

Let us see the sentences given below :

 "All M are P"
 "No M are P"
 "Some M are P"
 "Some M are not P"

What we notice in all above-Mentioned sentences that they are **condition free**. These type of sentences are called **Categorical Propositions**. In other words a categorical proposition has no condition attached with it and it makes direct assertion. It is different from non-categorical proposition which is in the format
 "If M then P"

Types of categorical proposition:

It can be understood by the diagram given below :
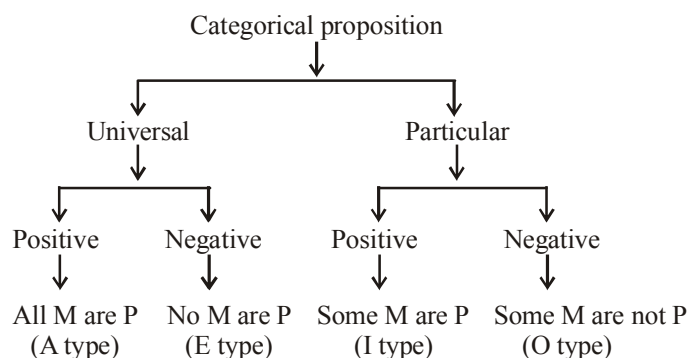
Therefore, it is clear, that universal propositions either completely include the subject (A type) or completely exclude it (E type). On the other hand, particular propositions either only partly include the subject (I type) or only partly exclude the subject (O type). Now we can summarise the four types of propositions to be used while solving the problems of syllogism :

Format	Type
All M are P	A
No M are P	E
Some M are P	I
Some M are not P	O

Venn Diagram

All A, E, I and O type of propositions can also be represented in pictorial way and this method is known as Venn diagram.

(i) **Representation** of **"All M are P" (A type):**
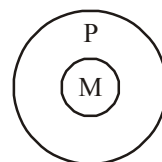
Here, the whole circle denoting M (all M) lies inside the circle denoting P. The other possibility is as picture given below :

(ii) **Representation of "No M are P" (E type):**

Here, the circle denoting M and P do not intersect at all and therefore, truely represents
 "No M are P"

(iii) **Representation of "Some M are P" (I type):**
This representation will be in two ways :
Either (a):

Here it is clear from the picture that shaded part of M is some part of P and shaded part of P is some part of M. Thus "Some M are P". Similarly, unshaded part of M is not P and unshaded part of P is not M. Thus it represents "Some M are not P".

Or (b):

Here, only shaded part of M is P also. Thus we can say "Some M are P."

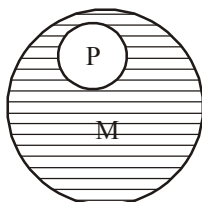(iv) **Representation of "Some M are not P" (O type):**
This representation will be in three ways :
Either (a):

Here, unshaded part of M is not a part of P. Thus it represents "Some M are not P." But the shaded part represents "Some M are P".

Or (b) :

Here, shaded part of M is not a part of P. Thus it represents "Some M are not P" and the circle denoting P represents "All P are M".
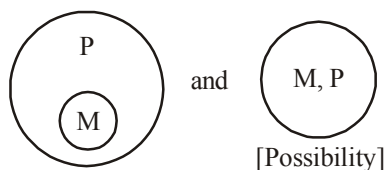
Or (c):

It is clear from this pictorial representation that this represents "Some M are not P" and "No M are P" as well.

Now we can make a summary of Venn diagram:

All M are P (A type):
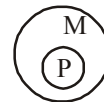

No M are P (E type):

Some M are P (I type):
Either:

Some M are P
[Some M are not P]

Or :

Some M are P
[All P are M]

Some M are not P (O type):
Either:

Some M are not P
[Some M are P]

Or:

Some M are not P
[All P are M]

HOW TO IDENTIFY HIDDEN PROPOSITIONS?

(i) A type: Apart from 'all' it starts with every, each and any.

EXAMPLE 1.

Every girl is beautiful.
[All girls are beautiful.]
Each of them is healthy.
[All (of them) are healthy.]
Any one could kill the lion.
[All can kill the lion.]

Further, let us see the sentences given below :

Thus, a positive sentence with a particular person as its subject is A type.

Also, a sentence in the following format is A type :

**(ii) E type:** Apart from 'no' this type of propositions starts from 'no one', 'none', 'not a single' etc.

EXAMPLE ✎ **2.**

No one (student) is studious.
[No student is studious]
None of the girl is beautiful.
[No girl is beautiful]
Not a single girl is healthy.
[No girl is healthy].

Further, let us see the sentences given below :

(He) does not deserve (Bharat Ratna)

↓   ↓
Subject   Predicate

(Amitabh Bacchan) is not a (great) actor.

↓   ↓
Subject   Predicate
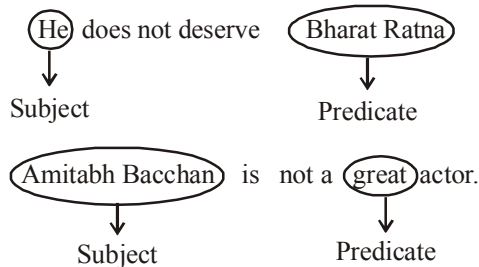
Thus, a negative sentence with a particular person as its subject is E type proposition.
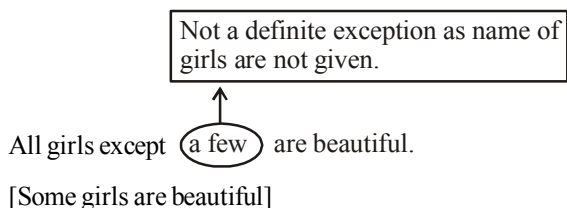
Also, sentences in following formats are E type :

definite exception
↑
"No student except (Reena) has failed"

"Is there any truth left in the world"
[No truth is left in the world.]

(iii) I type: Apart from some it also starts with words such as often, frequently, almost, generally, mostly, a few, most etc.

EXAMPLE ✎ **3.**

Almost all the girls are beautiful.
[Some girls are beautiful].
Most of the garments are handmade.
[Some of the garments are handmade].
Usually girls are beautiful.
[Some girls are beautiful.]
A few money are left in my wallet.
[Some money are left in my wallet].
Further, let us see the sentences given below :
Few girls are not studious.
[Some girls are studious.]
Rarely is a girl not beautiful.
[Some girls are beautiful].
Seldom are women not housewife.
[Some women are housewife].
It is clear from the above examples that negative sentences begining with words like 'few', 'rarely', 'seldom', etc. (Also 'hardly', 'scarcely', 'little' etc.) are to be reduced to I type. Just see the other formates given below :

Not a definite exception as name of girls are not given.
↑
All girls except (a few) are beautiful.

[Some girls are beautiful]

Not a definite exception as name of girls are not given.
↑
All girls except (5) have passed

[Some girls have passed]
Therefore, a positive proposition with an indefinite exception is reduced to I type.

(iv) O type : Apart from "Some .... not' this type of statements start with words like 'all', 'every', 'any', 'each', etc.

EXAMPLE ✎ **4.**

All girls are not beautiful.
[Some girls are not beautiful]
Every boy is not present.
[Some boys are not present.]
Further, let us see the following sentences :
Poor are usually not healthy.
[Some poor are not healthy]
Almost all the girls are not beautiful.
[Some girls are not beautiful.]
Most of the garments are not handmade.
[Some of the garments are not handmade.]
Girls are not frequently short tempered.
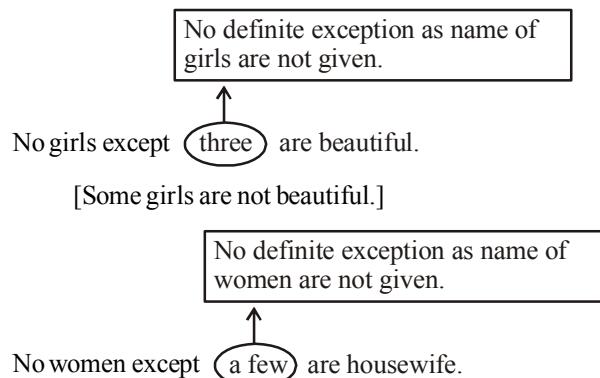[Some girls are not short tempered].

Now, it is clear from the above mentioned examples that negative propositions with words such as 'almost', 'frequently', 'most', 'mostly', 'a few', generally, etc. are to be reduced to the O–type propositions.

Again, positive propositions starting with words like 'few', 'scarcely', 'rarely', 'little', 'seldom' etc. are said to be O–type.

EXAMPLE ✎ **5.**

Seldom are women jealous.
[Some women are not jealous]
Few girls are beautiful.
[Some girls are beautiful]
Rarely is a wealthy person worried.
[Some wealthy person are not worried.]
Also, see the following formates :

No definite exception as name of girls are not given.
↑
No girls except (three) are beautiful.

[Some girls are not beautiful.]

No definite exception as name of women are not given.
↑
No women except (a few) are housewife.

Therefore, a negative proposition with an indefinite exception, is reduced to O type.

Identifying Exclusive Propositions

Such propositions start with 'only', 'alone', 'none else but', 'none but' etc. and they can be reduced to either A or E or I format.

EXAMPLE 6.

Only graduates are Probationary Officers.

⇒ No graduate is Probationary Officer (E type)

⇒ All Probationary Officers are graduates. (A type)

⇒ Some graduates are Probationary Officers (I type)

General format of sentences given in the examinations :

All M are P	(A type)
No M are P	(E type)
Some M are P	(I type)
Some M are not P	(O type)

Note : General format given above are frequently asked formats in the examinations. But students must be ready for other hidden formates of A, E, I and O types of propositions as problems in hidden formates can also be given in question papers.

Conversion of Propositions :

Before solving the problems of syllogism it is must to know the conversion rules of all A, E, O, and I types of propositions :

Conversion of A type :

Subject   Predicate

"All (M) are (P)" (A type)

After conversion it becomes.

Subject   Predicate

"Some (P) are (M) " (I type)

Therefore, it is clear that A type of propositions get converted into I type.

Conversion of E type :

Subject   Predicate

"No (M) are (P) "(E type)

After conversion it becomes

Subject   Predicate

"No (P) are (M)" (E type)

Therefore, E gets converted into E.   "sss"

Conversion of I type :

Subject   Predicate

"Some (M) are (P) " (I type)

After conversion it becomes

Subject   Predicate

"Some (P) are (M)" (I type)

Therefore, I gets converted into I.

Conversion of O type :

O type of proposition can't be converted.

Note : In each conversion, subject becomes predicate and predicate becomes subject.

In fact, conversion is an immediate inference that is drawn from a single proposition while inference drawn from two propositions are called mediate inference.

Now we can make a short table of conversion to remember.

Table of conversion :

Type of proposition	Get converted into
A	I
E	E
I	I
O	Never get converted

Rule to draw conclusion :

After knowing conversion of propositions, we must learn the rules to draw conclusions. In problems of syllogism, conclusions are drawn either from single propositions or from two proposition or from both. But a conclusion from single proposition is just a conversion of that proposition while to get conclusion from two propositions a certain table is used that tells us what type of conclusion (in form of proposition) we get out of two propositions. To understand it, let us see the following conclusion table :

Conclusion Table

I Proposition	II Proposition	Conclusion
A	A	A
A	E	E
E	A	$(O)^R$
E	I	$(O)^R$
I	A	I
I	E	O

Note :

(a) Apart from above 6 pairs of propositions, no other pair will give any conclusion.

(b) The conclusion drawn out of two propositions is itself a proposition and its subject is the subject of the Ist statement while its predicate is the predicate of the 2nd statement. The common term get disappeared.

(c) $(O)^R$ does mean that the conclusion is O type but is in reverse order. In this case, the subject of the inference or conclusion is the predicate of the 2nd proposition and the predicate of the conclusion is the subject of the Ist sentence or statement.

(d) The conclusion table gives correct conclusions or inference if and only if the two propositions are aligned properly.

WHAT IS ALIGNING ?

Let us see the following examples :

EXAMPLE 7.

Statements :

I.   All (girls) are beautiful.

II.   Some (girls) are Indian.

EXAMPLE 8.

Statements :

I.   No (pen) is chair.

II.   Some tables are (pen).

EXAMPLE 9.

Statements :

I.   Some women are (men).

II.   No (men) is chair.

In all the above mentioned example, we notice that in two statements of every example, there is a common term. In example 1 the word 'girl' is common; in example 2 the word 'pen' is common while in example 3 the word 'men' is common.

Now, the aligning of the two statements (propositions) does mean that the pair of statements must be written in such a way that the common term is the predicate of the 1st sentence and the subject of the 2nd.

Just think over the following examples :

Statements :

I. Some girls are (cute).

II. All (cute) are tall.

Here, the common term cute is the predicate of the I statement and subject of the 2nd statement. Therefore, the two statements (I & II) are properly aligned.

But see another example.

Statements :

I. Some (bats) are chairs.

II. Some cats are (bats).

Here, the sentences are not aligned as the predicate of the 1st statement is not the subject of the 2nd.

Then how to align it ? In such type of cases we change the order of sentences. In another words we put I sentence in place of II and II in place of I :

II. Some cats are (bats).

I. Some (bats) are chairs.

Let us consider another pair of statements.

I. All bats are chair.

II. All bats are cats.

Then how to align it ? In fact, in such cases we do alignment in two ways :

(a) by converting statement I as

I. Some chair are (bats).

II. All (bats) are cats.

and

(b) by changing the order of the sentences and then converting the statement II.

Now 1st change the order as :

II. All bats are cats.

I. All bats are chair.

Again we do conversion for II and the aligned pair takes the form as

II. Some cats are (bats).

I. All (bats) are chair.

Therefore, as per the requirement and nature of the sentence the alignment is done.

(i) only by changing the order of sentences.

                        or

(ii) only by converting of the sentences.

                        or

(iii) By changing the order of the statements and then converting one of the sentences.

IEA Rule

Alignment must be done in IEA order. It does mean that if the two statements are I & E then the conversion must be done for I and for E & I it will be done for E.

After discussing all the minute things about this chapter, now we have come at the position of solving the problems of syllogism. This chapter suggests two methods:

(1) By Analytical Method

(2) By Venn Diagram

(1) **Analytical method :**

This method has two main steps :

(a) Aligning the pair of sentences.

(b) Using conclusion table to draw conclusion.

EXAMPLE 10.

Statements :

I. All rats are cats.

II. All rats are men.

When aligned it takes the form as

I. Some cats are (rats) [I type]

II. All (rats) are men [A type]

Now we use the conclusion table given in this chapter that says

I + A = I type of conclusion.

Therefore, the drawn conclusion must be

    "Some cats are men"

It is clear that the conclusion drawn "Some cats are men" is a mediate inference as it is the result of two propositions. But in actual problem immediate inferences are also given in conclusion part and that format is given below :

EXAMPLE 11.

Statements :

I. All rats are cats.

II. All rats are men.

Conclusion :

(i) Some cats are men.

(ii) Some men are cats.

(iii) Some rats are cats.

(iv) Some cats are rats.

(v) Some rats are men.

(vi) Some men are rats.

Answer options :

(a) only (iii) follows

(b) only (i), (ii) and (iii) follow

(c) only (iv) follows

(d) all follow

(e) none of these

Here, the correct option is (d).

Conclusion (i) follows because it is the mediate inference of statements I & II.

Conclusion (ii) is the conversion of conclusion (i).

Conclusion (iii) is the immediate inference (conversion) of statement I while conclusion (iv) is the conversion of conclusion (iii).

Conclusion (v) is the immediate inference (conversion) of statement II while conclusion (vi) is the conversion of conclusion (v).

Further, in some problems complementary pairs are also seen in the conclusion part in the forms of sentence given below :

(i)   Some cats are rats.
(ii) Some cats are not rats. } I-O pair

(i)   All cats are rats.
(ii) Some cats are not rats. } A-O pair

(i)   Some cats are rats.
(ii) No cats are rats. } I-E pair

Apart from I-O, A-O and I-E pair the two sentences must have same subject and predicate as are the above mentioned pairs. For these pairs we write the form

Either (i) or (ii) follows

For example, see the following format :

EXAMPLE 12.

Statements :

I.   Some dogs are cats.   II.   Some cats are rats.

Conclusions :

(i)   Some cats are dogs.
(ii)   Some rats are cats.
(iii) All cats are rats.
(iv)   Some dogs are rats.
(v)   Some dogs are not rats.

Answer options :

(a) All follow.
(b) Only (i) follows.
(c) Only (ii) and (iii) follow.
(d) Either (iv) or (v) and (i) & (ii) follow.

Here, option (d) is correct because conclusion (i) is the immediate inference (conversion) of statement I while conclusion (ii) is the immediate inference of II. Conclusion (iv) & (v) make complementary pair of I-O type.

Conclusion (iii) is not correct because I and II are I type of statements and I + I does not give any conclusion. Further, A type of conclusion can not be found from the immediate inferences (conversion) of I type of statements as I & II are.

Now, the complete process of solving syllogism problems can be summaried as below :

(a) 1st step is aligning the sentences.
(b) 2nd step is using conclusion table.
(c) 3rd step is checking immediate inferences.
(d) 4th step is checking through the conversion of immediate inferences & mediate inferences.
(e) Checking the complementary pairs.

(2) **Venn diagram method for solving problems :**

Students will have to adopt three steps to solve the syllogism problems through Venn diagram method :

(a) 1st step is sketching all possible pictorial representation for the statements separately.
(b) 2nd step is combining possible pairs of these representations of all the statements into one.
(c) 3rd and final step is making interpretation of this combined figure. Conclusions are true if they are supported by all the combined figures in 2nd step.

Now let us solve a problem.

EXAMPLE 13.

Statements :

A. All chairs are books.   B.   All books are ties.

Conclusions :

I.   Some ties are books.   II.   Some ties are chairs.

1st Step :

1A   1B

2A   2B
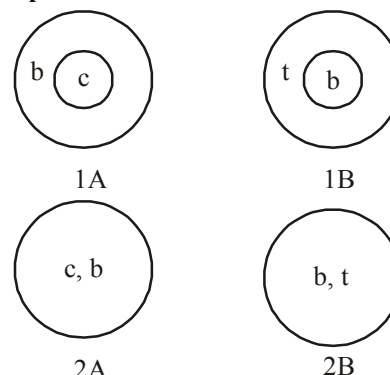
Here, 1A and 2A are representations for statement A while 1B and 2B are representations for statement B. In these representations

  b = books
  c = chairs
  t = ties

2nd step :

Let us combine all the possible pairs of this pictorial representations :

(1A + 1B)   (1A + 2B)

(2A + 1B)   (2A + 2B)
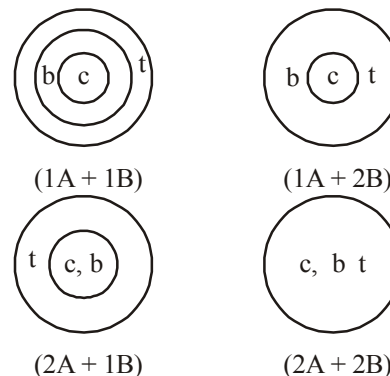
3rd step :

When we interpret the pictures in step II, we find that all the pictures support both the conclusions. Therefore, conclusion I :

"Some ties are books" and

conclusion II.

"Some ties are chairs"

both are true.

Important Note : *In the Venn diagram method, any conclusion given with any problem will be true if and only if it is supported by all the combined pictorial representations through 2nd step. If any pictorial representation contradicts the given conclusion, it will be put in the category of incorrect or wrong conclusion.*
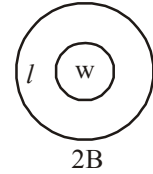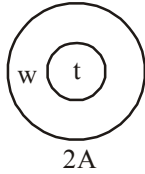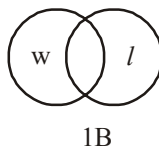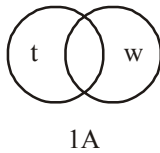
Now take another problem :

EXAMPLE 14.

Statements :

A. Some tigers are wolves.
B. Some wolves are lions.

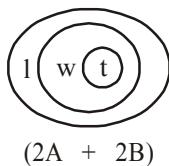**Conclusion :**

I.   Some tigers are lions.
II. Some tiger are not lions.

Sol. 1st step :

1A   1B

2A   2B

2nd step :

(1A + 1B)

(2A + 1B)

(1A + 2B)

(2A + 2B)
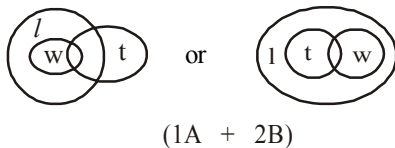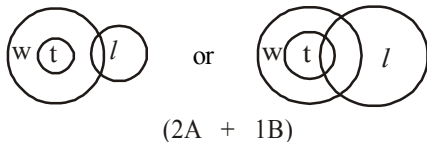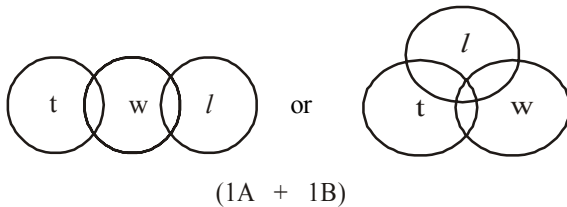
POSSIBILITY

Possibility is a concept of inconsistency for an event which is not yet verified but if true would explain certain facts or phenomena.

Generally the meaning of possibility is probability, *viz.* possibility exists where nothing is certain between the objects. In general language determination of possibility exist easily in that condition when between two objects have no certainty or the truth facts accordingly.

Let's understand below table in which possibility exists where no definite relation occurs between the objects and definite or proper relation between the objects eliminate existance of any possibility. In simple way given condition eliminates the possibility and improper condition favours the possibility. Here, we can go through with an example which will also clear the term possibility.

Condition	Possibility
Given facts	cannot be determined
Imaginary facts	can be determined

EXAMPLE 15.

    Statements Some boxes are trees
                  Some trees are hens.
    Conclusions I. Some boxes being hens is a possibility
                  II. All trees being hens is a possibility

Sol.
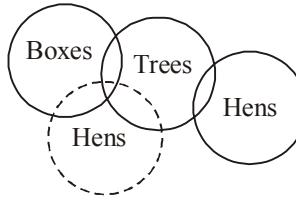
In Conclusion I, before deciding the possibility between boxes and hens, we must notice the relation between both, we find that there is no relation between boxes and hens, so possibility favours the condition and the conclusion I is true for possibility and in Conclusion II we must notice the relation between trees and hens. We find that both have some type of relation between them so the possibility of 'All between trees and hens is true. Hence, both the Conclusions I and II follow.

Given Exclusive Proposition	Desired Proposition	Possibility
All	All	×
Some	Some	×
No	No	×
No	Some not	×
Some	All	✓
No proper relation	Some All	✓

Note: Improper relation between two objects favours the possibility (In above example Conclusion I)

Special Cases of Exclusive Proposition

If the statement is of	Conversion	Illustration	Meaningful Conversion
Much, more, many, very, a few, most, almost	Some	Most A are B. A few X are Y.	Some A and B. Some X or Y.
Atleast	Some	Atleast some A are B.	Some A and B.
Definitely	No use	Some A are definitely B. Some X are definitely not Y.	Some A are B. Some X are not Y.
Only		Only A are B.	All B are A.
1% to 99%	Some	38% A are B. 98% X are Y.	Some A are B. Some X are Y.

EXERCISE

Directions (Qs. 1-5) : In each questions below are given some statements followed by two conclusions I and II. You have to take 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. Read both the conclusions and give answer as

(a) If only conclusion I follows.
(b) If only conclusion II follows.
(c) If either conclusion I or II follows.
(d) If neither conclusion I nor II follows.
(e) If both conclusions I and II follow.

1. **Statements :** All mobiles are androids.
No android is a phone.
   Conclusions : I. Some mobiles are not phones.
   II. No phone is a mobile.

2. **Statements :** All artists are smokers.
Some smokers are drunkards.
   Conclusions : I. All smokers are artists.
   II. Some drunkards are not smokers.

3. **Statements :** Some pastries are toffees.
All toffees are chocolates.
   Conclusions : I. Some chocolates are toffees.
   II. Some toffees are not pastries.

4. **Statements :** All stones are water.
Some water are clean.
   Conclusions: I. Some stones are clean.
   II. No stone is clean.

5. **Statements :** All umbrellas are aeroplanes.
Some aeroplanes are birds.
   Conclusions: I. Some umbrellas are aeroplanes.
   II. Some birds are umbrellas

Directions (Qs. 6-20) : In each of the questions 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 with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

6. **Statements:**
Some boxes are trees.
Some trees are horses.
All horses are fruits.
   Conclusions:
   I. Some fruits are boxes.
   II. Some fruits are trees.
   III. Some horses are boxes
   IV. No fruits are boxes.
   (a) None follows
   (b) Only either II or IV follows
   (c) Only either I or IV and II follow
   (d) Only either I or III and IV follow
   (e) None of these

7. **Statements:**
All fans are rooms.
No room is green.
Some windows are green.
   Conclusions:
   I. Some windows are fans.
   II. Some windows are rooms.
   III. Some fans are green.
   IV. No green is fan.
   (a) Only I follows   (b) Only III follows
   (c) Only IV follows   (d) Only II and IV follow
   (e) All follow

8. **Statements:**
No man is sky.
No sky is road.
Some men are roads.
   Conclusions:
   I. No road is man.
   II. No road is sky.
   III. Some skies are men.
   IV. All roads are men.
   (a) None follows   (b) Only I follows
   (c) Only I and III follow (d) Only II and III follows
   (e) None of these

9. **Statements:**
Some shirts are coats.
All coats are jackets.
Some jackets are trousers.
   Conclusions:
   I. Some shirts are jackets.
   II. Some jackets are shirts.
   III. All trousers are jackets.
   IV. Some trousers are jackets.
   (a) All follow
   (b) Only I, II and III follow
   (c) Only I, II and IV follow
   (d) Only II, III and IV follow
   (e) None of these

10. **Statements:**
All bikes are scooters. .
All scooters are scooties.
All scooties are mopeds.
   Conclusions:
   I. All mopeds are scooties.
   II. All scooties are scooters.
   III. All scooters are bikes.
   IV. All bikes are mopeds.
   (a) None follows   (b) All follow
   (c) Only III and IV follow (d) Only IV follows
   (e) None of these

11. **Statements:**
All biscuits are chocolates.
Some chocolates are breads.
All breads are pastries.
Conclusions:
I.   Some biscuits are pastries.
II.   Some pastries are chocolates.
III. Some biscuits are not pastries.
IV.   All pastries are breads.
(a) Only I and II follow
(b) Only I, lI and III follow
(c) Only either I or III and II follow
(d) Only either I or III and IV follow
(e) None of these

12. **Statements:**
Some buses are trains.
No train is a dog.
All dogs are parrots.
Conclusions:
I.   No bus is a parrot.
II.   Some parrots are trains.
III. Some parrots are buses.
IV.   No dog is a bus.
(a) Only either I or III follows
(b) Only II follows   (c) Only IV follows
(d) Only I and III follow   (e) None of these

13. **Statements:**
Some cups are flowers.
Some flowers are boxes.
All boxes are tigers.
Conclusions:
I.   Some tigers are cups.
II.   Some tigers are flowers.
III. Some boxes are cups.
IV.   No tiger is a flower.
(a) None follows
(b) Only either II or IV follows
(c) Only III follows
(d) Only either I or III follows
(e) None of these

14. **Statements:**
All glasses are roads.
No road is a stick.
Some sticks are pens.
Conclusions:
I.   Some glasses are sticks.
II.   Some pens are sticks.
III. Some roads are sticks.
IV.   No glass is a stick.
(a) None follows
(b) Only I or IV and II follow
(c) Only either I or III or II follows
(d) Only either I or II and IV follow
(e) None of these

15. **Statements:**
All buses are trains.
All trains are rickshaws.
All rickshaws are cycles.

Conclusions:
I.   All cycles are buses.
II.   All rickshaws are buses.
III. All buses are rickshaws.
IV.   All trains are cycles.
(a) All follow   (b) None follows
(c) Only.I and II follow   (d) Only II and III follow
(e) None of these

16. **Statements:**
No tree is fruit.
All fruits are stones.
All stones are rains.
Conclusions:
I.   No stone is tree.
II.   No rain is tree.
III. Some rains are fruits.
IV.   Some rains are trees.
(a) None follows
(b) Only either II or IV and III follow
(c) Only either II or III and I follow
(d) All follow
(e) None of these

17. **Statements:**
All fans are tubelights.
No pen is a bulb.
Some bulbs are fans.
Conclusions:
I.   Some pens are tubelights.
II.   No pens are tubelights.
III. Some tubelights are fans.
IV.   All tubelights are fans.
(a) Only I and II follow
(b) Only I, II and III follow
(c) Either I or II and III follow
(d) Only III and IV follow
(e) None of these

18. **Statements:**
All shirts are trousers.
Some socks are shoes.
All shoes are shirts.
Conclusions:
I.   Some socks are shirts.
II.   Some socks are trousers.
III. All shoes are trousers.
IV.   All shoes are socks.
(a) Only I and II follow   (b) Only I or II or III follows
(c) Only II and IV follow   (d) Only III and IV follow
(e) None of these

19. **Statements:**
All cups are tables.
No table is water.
Some waters are clothes.
Conclusions:
I.   No cloth is cup.
II.   No cloth is table.
III. Some clothes are waters.
IV.   Some waters are cups.
(a) None follows   (b) All follow
(c) Only III follows   (d) Only I and II follow
(e) None of these

20. **Statements:**
No table is fruit.
No fruit is window.
All windows are chairs.
Conclusions:

I.	No window is table.	II.	No chair is fruit.
III.	No chair is table.	IV.	All chairs are windows.
(a)	None follows	(b)	All follow
(c)	Only I and II follow	(d)	Only III and IV follow
(e)	None of these		

Directions (Qs. 21-35): In each of the following questions two/ three statements are given and these statements are followed by two conclusions numbered I and II. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

Give answer:
(a) If only I conclusion follows
(b) If only II conclusion follows
(c) If either I or II follows
(d) If neither I nor II follows
(e) If both I and II follow

21. **Statements:** Some mobiles are pagers.
No mobile is a laptop.
Conclusions: I. No laptop is a pager.
II. Some pagers are definitely not mobiles

22. **Statements:** All tables are chairs.
All chairs are beds.
No bed is sofa.
Conclusions: I. Some tables are definitely not beds.
II. No sofa is a table.

23. **Statements:** All tables are chairs.
All chairs are beds. No bed is sofa
Conclusions: I. No chair is sofa.
II. Some tables being sofa is a possibility.

24. **Statements:** Some digits are letters.
All digits are symbols. No symbol is an alphabet.
Conclusions: I. Some symbols are letters.
II. No digit is an alphabet.

25. **Statements:** All rivers are seas. Some seas are oceans.
Conclusions: I. All rivers are oceans.
II. All oceans being rivers is a possibility.

(Qs. 26-27)
Statements: A. Some poor are rich
B. All rich are doctors.
C. Some intelligent are doctors.

26. **Conclusions:** I. At least some poor are intelligent.
II. All intelligent being rich is a possibility.

27. **Conclusions:** I. All intelligent being doctors is a possiblity.
II. Some poor are doctors.

(Qs. 28-29)
Statements: A. All fans are bulbs
B. All wires are holders.
C. Some wires are bulbs.

28. **Conclusions:** I. At least some fans are wires.
II. All holders being fans is a possibility.

29. **Conclusions:** I. All fans being holders is a possibility.
II. Some holders are bulbs.

(Qs. 30-31)
Statements: A. No saving A/c is a current A/c.
B. Some fixed deposits are saving A/c.
C. Some currents A/c are recurring deposits.

30. **Conclusions:** I. All saving A/c being current A/c is a possibility.
II. All fixed deposits being current A/c is a possibility.

31. **Conclusions:** I. All current A/c being fixed deposits is a possibility.
II. All saving A/c being recurring deposits is a possibility.

32. **Statements:** All shopkeepers are servants.
Some shopkeepers are poor.
No poor is rich.
Conclusions: I. All shopkeepers, If they are poor, are also rich
II. At least some shopkeepers being rich is a possibility.

33. **Statements:** All books are dictionaries.
Some books are diaries.
All dictionaries are copies
Conclusions: I. Some books are not copies
II. All dictionaries being diaries is a possibility.

34. **Statements:** No fan is a light.
All boards are fans.
All fans are wires.
Conclusions: I. All boards being wires is a possibility.
II. No boards is a light.

35. **Statements :** No air is wind.
All winds are typhoons.
Conclusions: I. No air is typhoon.
II. All air being typhoons is a possibility.

Directions(Qs. 36-56): In each of the following questions two/ three statements are given and these statements are followed by two/three/four conclusions. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

36. **Statements :** All petals are flowers.
Some flowers are buds.
Some buds are leaves.
All leaves are plants.
Conclusions: I. Some petals are not buds.
II. Some flowers are plants.
III. No flower is plant.
(a) Only I follows (b) Either II or III follows
(c) I and II follow (d) Only III follows
(e) None of the above

37. **Statements :** Some pens are keys.
Some keys are locks.
All locks are cards.
No card is paper.

Conclusions: I. No lock is paper.

II. Some cards are keys

III. Some keys are not paper.

(a) I and II follow   (b) Only I follows

(c) Only II follows   (d) All follow

(e) None follows

38. **Statements:** Some pearls are gems.

All gems are diamonds.

No diamond is stone.

Some stones are corals.

Conclusions: I. Some stones are pearls.

II. Some corals being diamond is a possibility.

III. No stone is pearl.

(a) Only I follows   (b) Only II follows

(c) Either I or III follows   (d) I and II follow

(e) None of these

39. **Statements :** Some apartments are flats.

Some flats are buildings.

All buildings are bungalows.

All bungalows are gardens.

Conclusions: I. All apartments being building is a possibility.

II. All bungalows are not buildings

III. No flat is garden.

(a) None follows   (b) Only I follows

(c) Either I or III follows   (d) II and III follow

(e) Only II follows

40. **Statements :** All chairs are tables.

All tables are bottles.

Some bottles are jars.

No jar is bucket.

Conclusions : I. Some tables being jar is a possibility.

II. Some bottles are chairs.

III. Some bottles are not bucket.

(a) Only I follows   (b) I and II follow

(c) All follow   (d) Only II follows

(e) None of these

41. **Statements :** Most of the doctors are engineers.

None of the engineers is a pilot.

All pilots are doctors.

Conclusions : I. Some engineers are doctors.

II. All doctors are pilots.

III. No pilot is an engineers.

IV. Some pilots are engineer.

(a) Only I follow   (b) II and III follows

(c) I and III follow   (d) Either III or IV follows

(e) None of these

Directions (Qs. 42-43) : In each questions below are given three statements followed by three Conclusions I, II and III. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusion logically follows from the given statements disregarding commonly known facts.

42. **Statements :** Some nurses are doctors.

All doctors are medicines.

Some medicines tables.

Conclusions: I. Atleast some tablets are doctors.

II. Some medicine being doctors is a possibility.

III. Some medicine are definitely nurses.

(a) All follow   (b) II and III follow

(c) Only II follow   (d) Either III or Iv follows

(e) None of these

43. **Statements :** All files are folders.

All folders are boxes.

All boxes are drawers.

Conclusions: I. All folders being drawers is a possibility.

II. All boxes are files.

III. All files are definitely drawers.

IV. Atleast some drawers are folders.

(a) I and II follow   (b) III and IV follow

(c) II and III follow   (d) All follows

(e) None of these

Directions (Qs. 44-45) : In each question given four statements are followed by three Conclusions I, II and III. You have to take the four given statements to be true even if they seem to be at variance from the commonly known facts. Read the conclusions and decide which logically follows from the four given statements disregarding commonly known facts.

44. **Statements :** All footballers are music lover.

All footballers are dancer.

No dancer is cricketer.

No cricketer is player.

Conclusions : I. Some players can be music lover.

II. 25% of footballers are music lover.

III. No footballers is cricketer.

(a) Both II and III follow

(b) Only III follows

(c) Only II follows

(d) Only II and either I or III follow

(e) None of the above

45. **Conclusions :** I. Some cricketer are music lover.

II. There is a possibility that any cricketer can be music lover.

III. No music lover are cricketer.

(a) Either I or II follows

(b) Only I follows

(c) Only II follows

(d) Only II and either I or III follow

(e) None of the above

(Qs. 46 and 47):

Statements : All villages are cities.

Some cities are tehseel.

No tehseel is state.

46. **Conclusions :** I. Some states are cities being a possibility.

II. All cities are villages being a possibility.

(a) Only I follows   (b) Only II follows

(c) Either I or II follows   (d) None follows

(e) Both follow

47. **Conclusions :** I. Some states can never be tehseels.

II. All villages and cities being tahseel is a possibility.

(a) Only I follows   (b) Only II follows

(c) Either I or II follows   (d) None follows

(e) Both follows

Directions (Qs. 48-50) : In each of the questions below are given some statements followed by some conclusions. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide with of the given statements disregarding commonly known facts.

48. **Statements :** Some roses which are plants are flowers.
   All plants are lotus.
   Conclusions: I. Some lotus are not flowers.
   II. Some lotus which are roses are flowers.
   III. Some roses are lotus.
   (a) I and II follow   (b) Only II follows
   (c) II and III follows   (d) Only III follows
   (e) None of these

49. **Statements :** All matches are cups.
   Some fields are not viewers.
   All viewers are fans.
   Some matches are not fans.
   Conclusions: I. Some cup which are fans are not viewers.
   II. Some matches which are not viewers are cups.
   III. Some fields which are fans are not matches.
   (a) I and III follow   (b) Only II follows
   (c) II and III follows   (d) Only III follows
   (e) None of these

50. **Statements:** Some schools which are not students are colleges.
   Student is a principal.
   All schools are principals.
   Conclusions: I. No college is a principal.
   II. Some principals are colleges.
   III. All colleges are schools.
   (a) I and III follow   (b) Either I or II follows
   (c) Only II follows   (d) Either I or III follows
   (e) None of these

Directions (Qs. 51-54) In these questions statements followed by two conclusions(A&B) numbered I and II have been given. You have to decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

51. **Statements:** All fishes are birds.
   No Bird is an animal.
   All animals are mammals.
   Conclusion A: I. At least some birds are mammals.
   II. All mammals being birds is a possibility.
   (a) Only conclusion II is true
   (b) Neither conclusion I or II is true
   (c) Both conclusion I and II are true
   (d) Either conclusion I or II is true
   (e) Only conclusion I is true
   Conclusion B: I. No fish is an animal
   II. All fishes being mammals is a possibility
   (a) Only conclusion II is true
   (b) Neither conclusion I or II is true
   (c) Both conclusion I and II are true

(d) Either conclusion I or II is true
(e) Only conclusion I is true

52. **Statements:** Some forces are groups
   All groups are powers
   All powers are growth
   Conclusion A: I. At least some forces are growth
   II. All groups are growth
   (a) Only conclusion II is true
   (b) Either conclusion I or II is true
   (c) Only conclusion I is true
   (d) Neither conclusion I or II is true
   (e) Both conclusion I and II are true
   Conclusion B: I. All forces being powers is possibility
   II. All powers are group
   (a) Only conclusion II is true
   (b) Either conclusion I or II is true
   (c) Only conclusion I is true
   (d) Neither conclusion I or II is true
   (e) Both conclusion I and II are true

53. **Statements:** All books are scales
   All scales are pencils
   Some scales are pens
   Conclusion A: I. No book is pen
   II. All pencils are scales
   (a) Only conclusion I follows
   (b) Only conclusion II follows
   (c) Either conclusion I or II follows
   (d) Neither conclusion I or II follows
   (e) Both conclusion I and II follows
   Conclusion B: I. At least some scales are pen
   II. No scale is a pen
   (a) Only conclusion I follows
   (b) Only conclusion II follows
   (c) Either conclusion I or II follows
   (d) Neither conclusion I or II follows
   (e) Both conclusion I and II follows

54. **Statements:** All rainy are summers
   Some summers are springs
   No spring is sunny
   Conclusion A: I. At least some rainy are springs
   II. Some sunny being summers is a possibility
   (a) Either conclusion I or II follows
   (b) Both conclusion I and II follows
   (c) Neither conclusion I or II follows
   (d) Only conclusion I follows
   (e) Only conclusion II follows
   Conclusion B: I. All summers can never be sunny
   II. No spring is a sunny
   (a) Either conclusion I or II follows
   (b) Both conclusion I and II follows
   (c) Neither conclusion I or II follows
   (d) Only conclusion I follows
   (e) Only conclusion II follows

ANSWER KEY

1	(e)	6	(c)	11	(c)	16	(b)	21	(d)	26	(b)	31	(e)	36	(b)	41	(c)	46	(e)	51	(b,c)
2	(b)	7	(c)	12	(a)	17	(c)	22	(b)	27	(b)	32	(b)	37	(d)	42	(e)	47	(e)	52	(e,c)
3	(e)	8	(e)	13	(e)	18	(e)	23	(a)	28	(d)	33	(b)	38	(e)	43	(b)	48	(c)	53	(d,c)
4	(c)	9	(c)	14	(e)	19	(c)	24	(e)	29	(e)	34	(b)	39	(a)	44	(e)	49	(b)	54	(e,b)
5	(d)	10	(d)	15	(e)	20	(a)	25	(b)	30	(d)	35	(b)	40	(c)	45	(d)	50	(c)		

Hints & Explanations

1. (e)
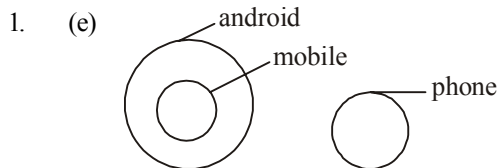
2. (b) All possible cases
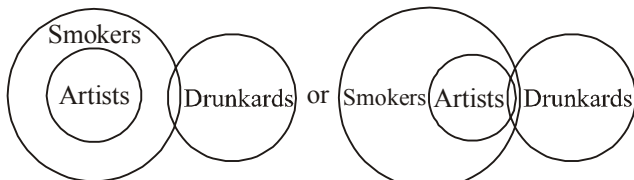
Hence, Conclusion II follows.

3. (e) All possible cases
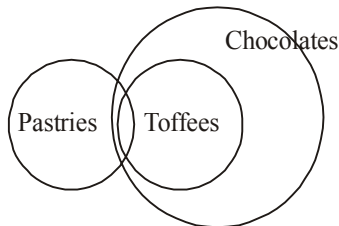
Hence, both I and II are true.

4. (c) All possible cases
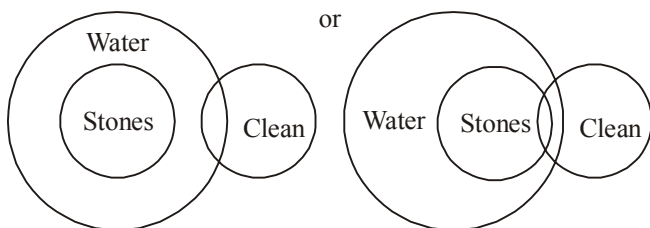
Alternative It is a special case, hence either Conclusion I or II follows.
Hence, either I or II follows.

5. (d) All possible cases
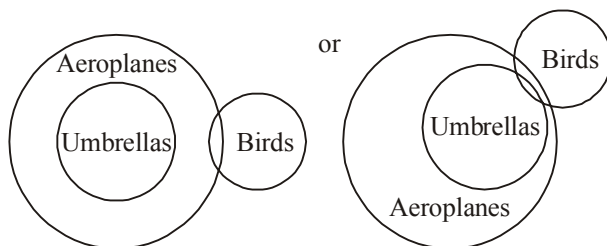
Hence, none follows.

6. (c) **Ist method :** Conclusion II follows from conversion of the conclusion obtained from statement (b) and statement (c) [∵ I + A = I]. Conclusion I, III and IV do not follow because statement (a) + statement (b) gives no conclusion. But the conclusion I and IV make a complementary pair IE-type. Hence, either of the two follows.
   IInd method:
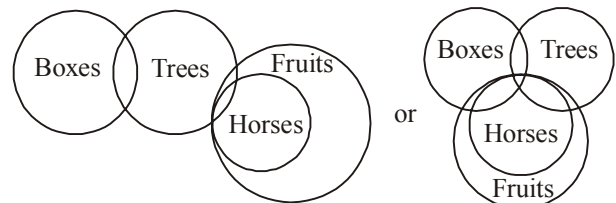
Conclusion   I : False ⎤
Conclusion II : True ⎥ OR
Conclusion III : False ⎥
Conclusion IV : False ⎦
Hence, only Either I or IV and II follow.

7. (c) **Ist method :** Statement (a) + statement (b) gives the conclusion "No fans are green" [say (d)] [∵ A + E = E]. Now, conversion of statement (d) gives conclusion IV. Now statement (c) + conclusion IV gives the conclusion "Some windows are not fans". Hence, I does not follow. Conclusion III does not follow because conclusion IV follows.
   Again, statement (b) + conversion of statement (c) gives the conclusion "Some windows are not rooms". Hence, conclusion II does not follow.
   IInd method:
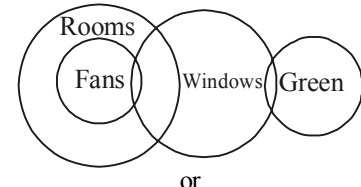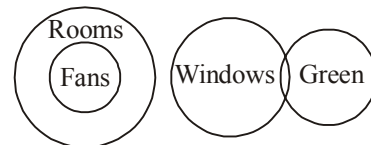
Conclusion   I : False
Conclusion II : False
Conclusion III : False
Conclusion IV : True

8. (e) **Ist method :** Only II follows. Statement (a) + statement (b) gives no conclusion [∵ E + E = no conclusion]. Hence, I does not follow. Note that I does not follow from statement (c) either. Conclusion II follows from conversion of statement (b). Conclusion III does not follow from statement (a). Conclusion IV does not follow from statement (c).

IInd method:
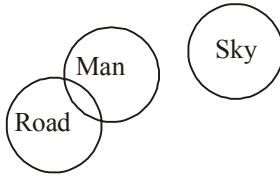
Conclusion   I : False
Conclusion II : True
Conclusion III : False
Conclusion IV : False

9. (c) **Ist method :** First + second statement gives conclusion I. Conclusion II follows as conversion of conclusion I. Third statement, on conversion, gives conclusion IV but not conclusion III.

IInd method:
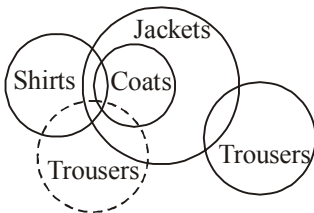
Conclusion   I : True
Conclusion II : True
Conclusion III : False
Conclusion IV : True

10. (d) **Ist method :** I does not follow from the last statement, on conversion. II does not follow from the second statement, on conversion. III does not follow from the first statement, on conversion. 1st + 2nd + 3rd statement gives conclusion IV.

IInd method:
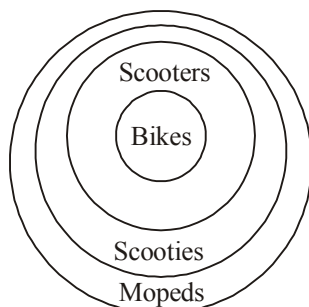
Conclusion   I : False
Conclusion II : False
Conclusion III : False
Conclusion IV : True

11. (c) **Ist method :** Some chocolates are breads + All breads are pastries ⇒ Some chocolates are pastries → on conversion → Some pastries are chocolates. Hence, II follows. 1st statement + Some chocolates are pastries gives no conclusion. Hence, I and III do not follow but they make a complementary (I-O) pair. Hence, either I or III follows. IV does not follow from the last statement.

IInd method:

or
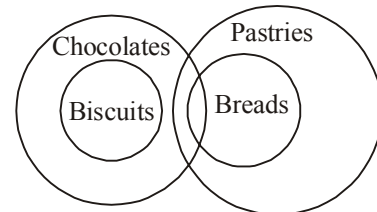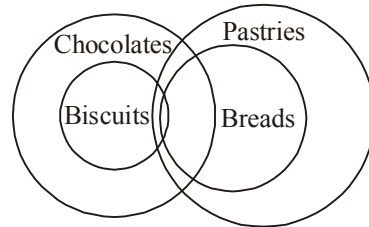
Conclusion   I : False ⎤
Conclusion II : True ⎥ OR
Conclusion III : False ⎦
Conclusion IV : False

12. (a) Conclusions I and III make a complementary pair. Hence, either I or III follows. Conclusion II does not follow since "No train is a dog" (E) + "All dogs are parrots" (A) gives the conclusion "Some parrots are not trains" [∵ E + A O ★]. Conclusion IV does not follow because "Some buses are trains" + "No train is a dog" gives the conclusion "Some buses are not dogs" [∵ I + E = O].

13. (e) "Some flowers are boxes" (I) + "All boxes are tigers" (A) gives conclusion "Some flowers are tigers" (I) [∵ I + A = I]. **On conversion,** we get "some tigers are flowers". Hence, conclusion II follows but IV does not follow. "Some cups are flowers" (I) + "Some flowers are boxes" (I) gives no conclusion [∵ I + I= No conclusion]. Hence, III does not follow. No relation is given between tigers and cups and hence, I does not follow.

14. (e)

or
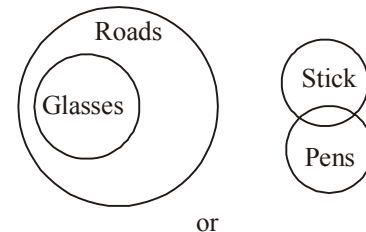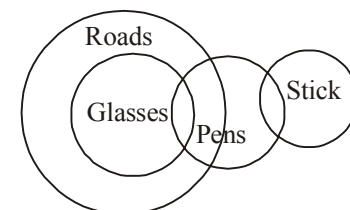
Conclusion   I : False
Conclusion II : True
Conclusion III : False
Conclusion IV : True

15. (e) 1st + 2nd statements gives conclusion III. 2nd + 3rd statements gives conclusion IV. I and II do not follow.

16. (b) Statement (a) + Statement (b) gives the conclusion "Some stones are not trees." [∵ $E + A = O\star$]. Hence, conclusion I does not follow. Statement (b) + Statement (c) gives the conclusion "All fruits are rains". On conversions it gives conclusion III. Now, statement (a) + "All fruits are rains" gives the conclusion "Some rains are not trees" [∵ $E + A = O\star$]. Conclusions II and IV do not follow but these two conclusions make a complementary pair (EI-type). Hence, either conclusion II or conclusion IV follows.

17. (c) **Ist method :** Some bulbs are fans + All fans are tubelights = Some bulbs are tubelights ... (a) [$I + A$ = I]. Now, statement (b) + (a) gives: .Some tubelights are not pens. Hence, conclusions I and II can't be established. III follows from first statement on conversion. But IV does not. But I and II make a complementary pair [I – E pair]. Hence, either I or II follows.

     IInd method:
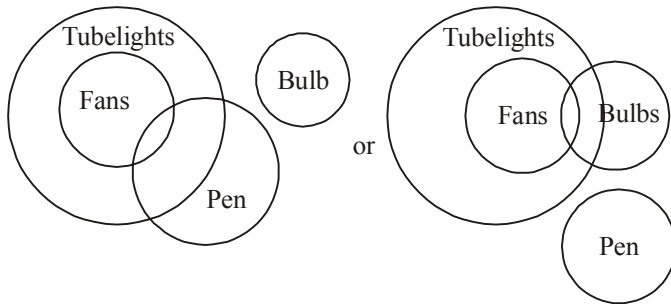
     Conclusion I : False ⎤
     Conclusion II : False ⎦ OR
     Conclusion III : True
     Conclusion IV : False

18. (e)
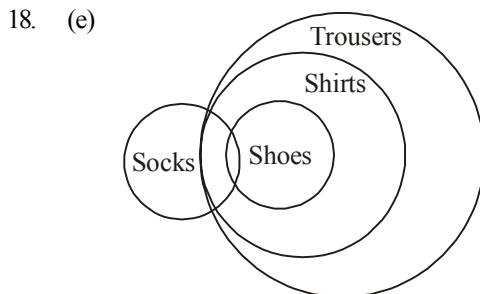
     Conclusion I : True
     Conclusion II : True
     Conclusion III : True
     Conclusion IV : False

19. (c) III follows from the last statement, on conversion. 1st statement + 2nd statement gives: No cup is water ... (A). Hence IV does not follow from A, on conversion. (A) + last statement gives: Some clothes are not cups. Hence, I does not follow. 2nd statement + last statement gives: Some clothes are not tables. Hence II does not follow.

20. (a) 1st + 2nd statement gives no conclusion. Hence I does not follow. 2nd + last statement gives: Some chairs are not fruits. Hence II does not follow. III does not follow from combining all. IV does not follow from the last statement, on conversion.

21. (d)

22. (b)

23. (a)

24. (e)

25. (b)
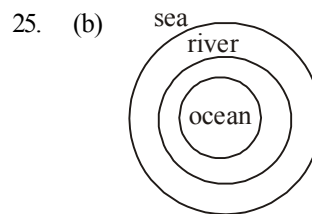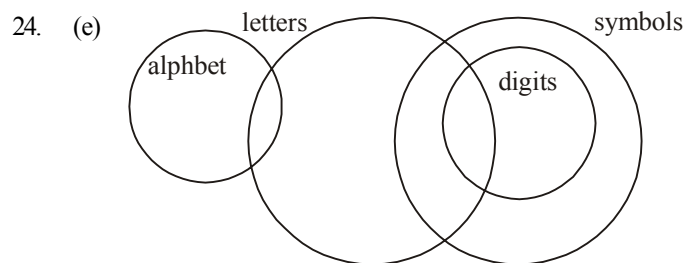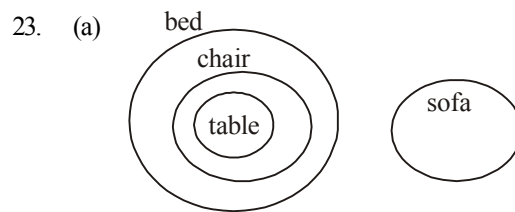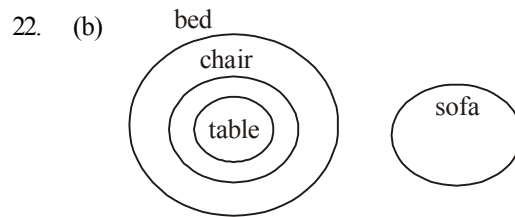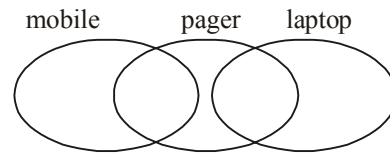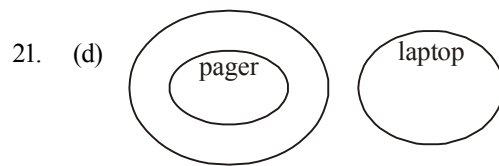
(26-27) :
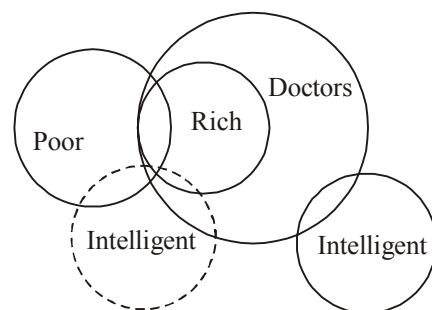
26. (b) Conclusion I : False
        Conclusion II : True

27. (b) Conclusion I : True
        Conclusion II : True

(28-29) :
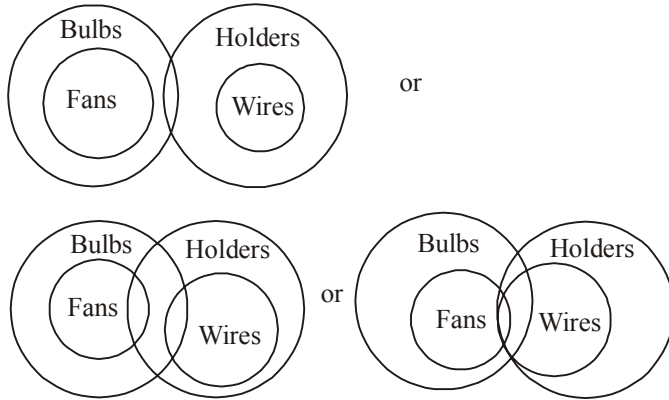
28. (d) Conclusion I : False
         Conclusion II. False
29. (e) Conclusion I : True
         Conclusion II : True
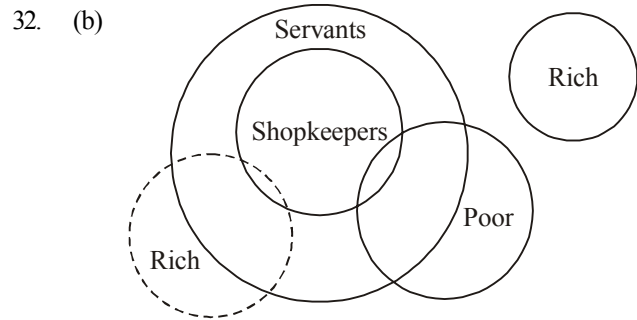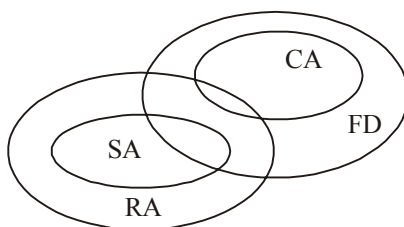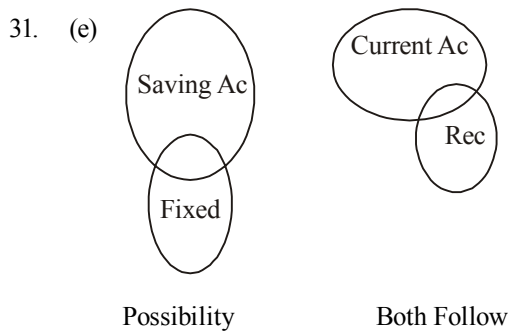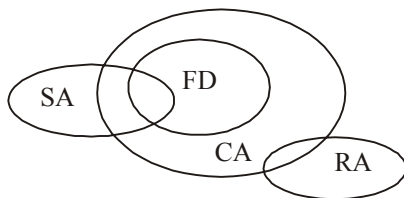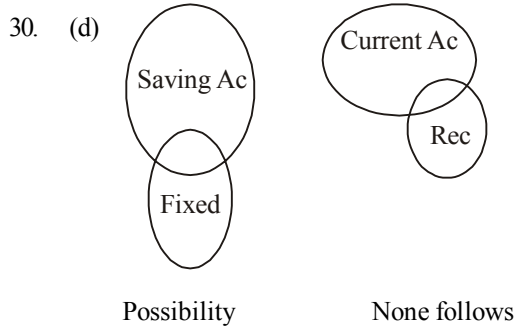
30. (d)

Possibility   None follows

31. (e)

Possibility   Both Follow

32. (b)

Conclusion I : False
Conclusion II. True

33. (b)
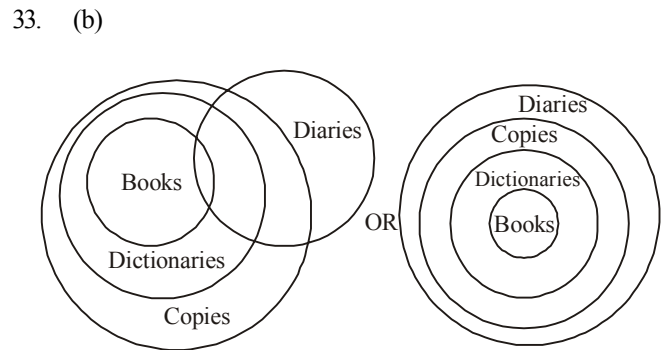
Conclusion I : False
Conclusion II. True

OR
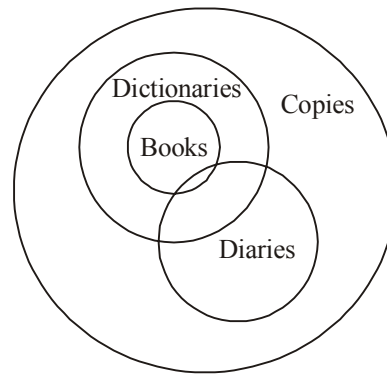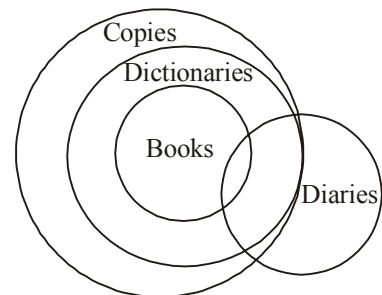
Conclusion I : False
Conclusion II. True

34. (b)

or
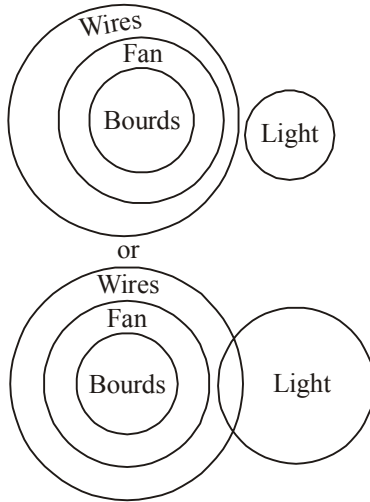
Conclusion I : False
Conclusion II. True

35. (b) According to given information,
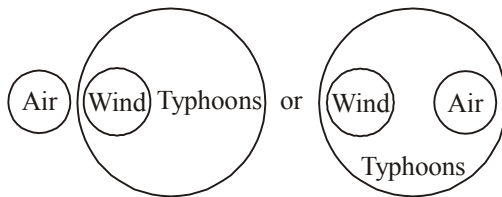
Hence, only Conclusion II follows.

36. (b) According to question,

or
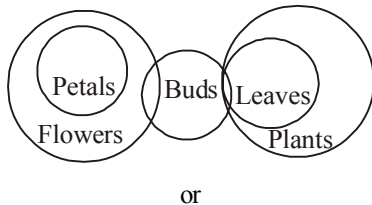
Conclusions:I. False
Conclusions:II.False ─┐
Conclusions:III.False ─┘ or
Hence, only either II or III follows.

37. (d) According to question

or
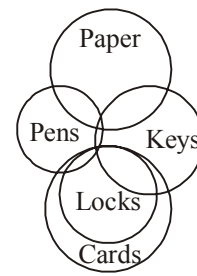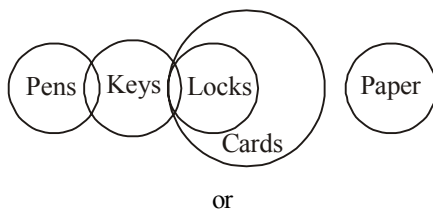
Conclusions:I. True
Conclusions:II.True
Conclusions:III.True
Hence, All conclusions follow.

38. (e) According to question,

OR
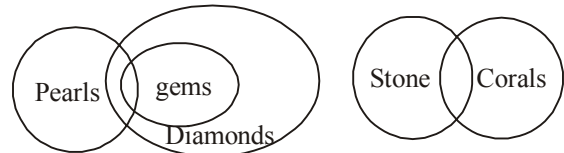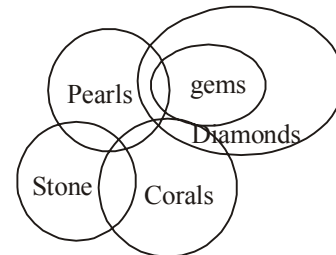
Conclusions:I. False ─┐
Conclusions:II.True ─┤ or
Conclusions:III.False ─┘
Hence, only conclusions II and either I or III follow.

39. (a) According to question,

Or
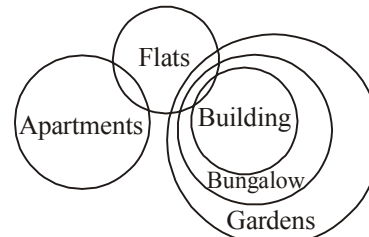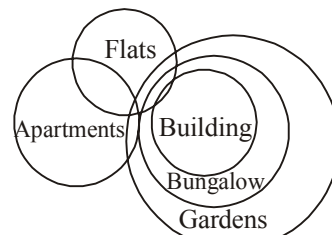
Conclusions:I. True
Conclusions:II.False
Conclusions:III.False
Hence, only conclusion I follows.

40. (c) According to question,

OR
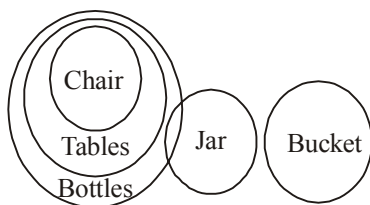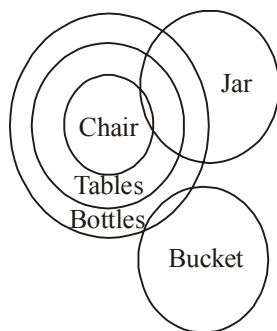
Conclusions:I.True
Conclusions:II.True
Conclusions:III.True
Hence, All I, II and III follow.

41. (c) According to given information,
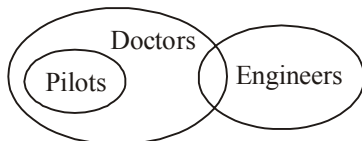
Hence, Conclusions I and III follow.

42. (e) According to given information

Hence, only Conclusions III follows.

43. (b) According to given information,
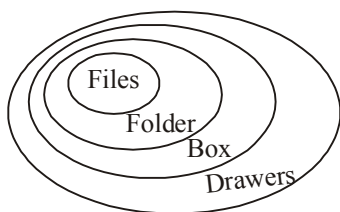
Hence, Conclusions III and IV follow.
According to given information,
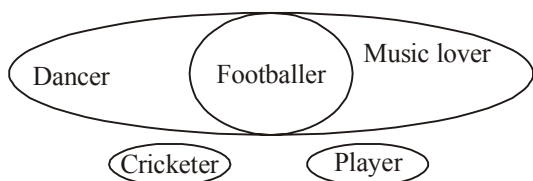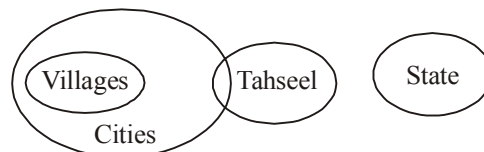

44. (e) Possibility case
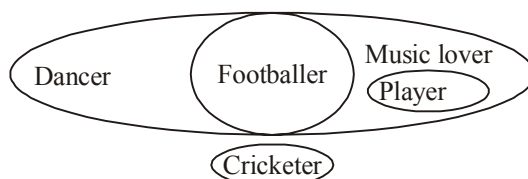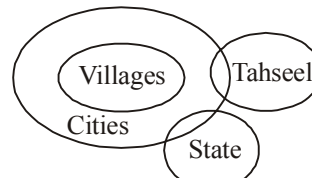

Hence, all of the Conclusions I, II and III follow.

45. (d) Possibility case
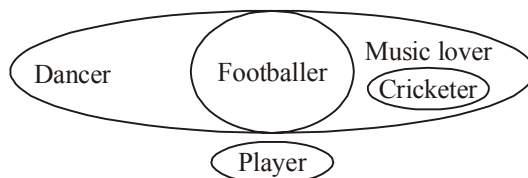
Hence, only II and either I or III follow.

(46-47) : According to given information,
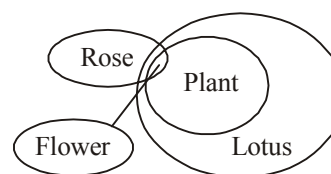

46. (e)

or
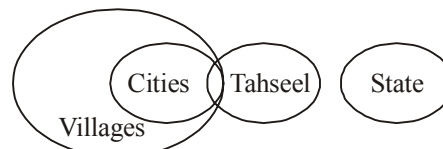
Hence, both the Conclusions I and II follow.

47. (e) Possibility case,
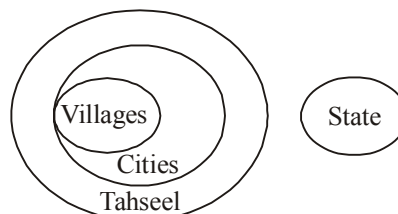
Hence, both the Conclusions I and II follow.
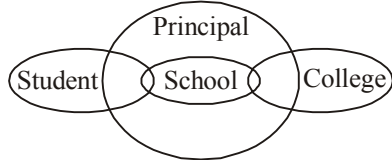
48. (c) According to given information,

Hence, Conclusions II and III follow.
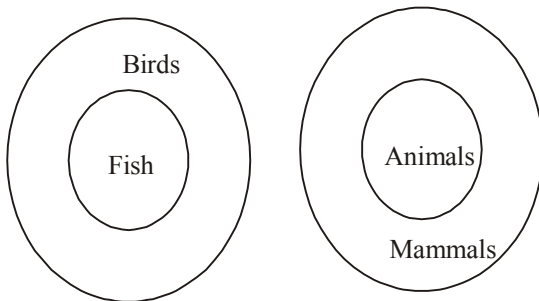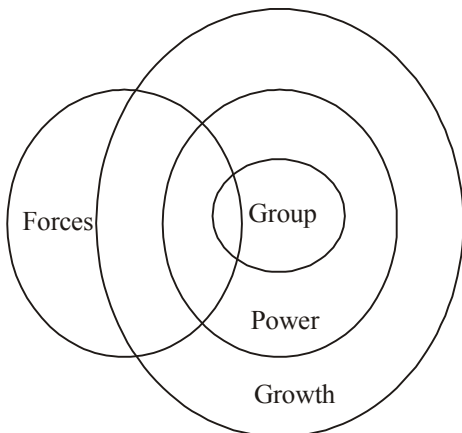
49. (b) According to given information,

Field — Viewers — Fan — Match — Cup

Hence, only Conclusion II follows.

50. (c) According to given information,

Principal

Student — School — College

Hence, only Conclusion II follows.

51.

Birds

Fish

Animals

Mammals

Conclusion A -
(b) Neither conclusion I or II is true
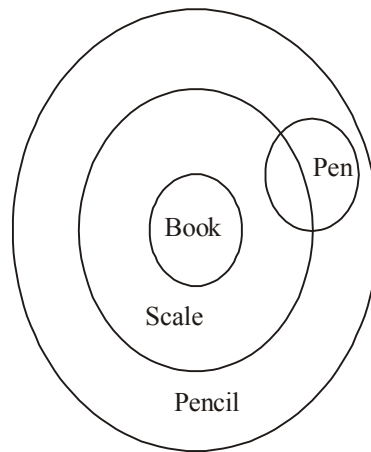Conclusion B -
(c) Both conclusion I and II are true

52.

Forces

Group

Power

Growth

Conclusion A -
(e) Both conclusion I and II are true
Conclusion B -
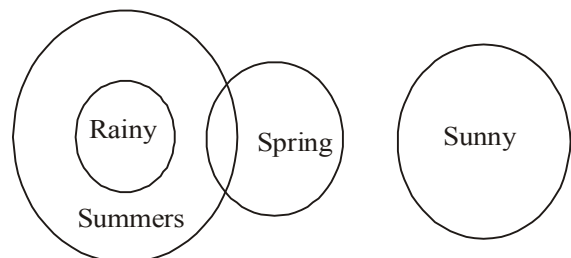(c) Only conclusion I is true

53.

Pen

Book

Scale

Pencil

Conclusion A:
(d) Neither conclusion I or II follows
Conclusion B:
(c) Either conclusion I or II follows

54.

Rainy

Spring

Sunny

Summers

Conclusion A:
(e) Only conclusion II follows
Conclusion B:
(b) Both conclusion I and II follows

◈ ◈ ◈