LOGICAL REASONING

- Syllogisms form an integral part of reasoning.

- Syllogism is a form of reasoning in which a conclusion is drawn from two or three given propositions or statements. It uses deductive reasoning rather than inductive reasoning.

Method 1- Analytical Method

Method 2- Venn Diagrams

Components of a Syllogism

Major & Minor Premises

A syllogism is made up of a major premise, a minor premise, and a conclusion. The major premise is a general statement, while the minor premise is a specific instance of the general statement.

Conclusion

The conclusion of a syllogism is the logical result of the combination of the major and minor premises.

MAJOR AND MINOR PREMISES IN STATEMENT

"All humans are mortal." "David Foster Wallace is a human."

"All humans are mortal."
→ **Major Premise**

"David Foster Wallace is a human." → **Minor Premise**

The questions given below has a set of two, three or four statements. Each set of statements is further divided into three segments. Choose the alternative where the third segment in the statement can be logically deduced using both the preceding two, but not just from one of them.

METHOD 1: ANALYTICAL METHOD

EXAMPLE 1

Statement

I.   All shirts are pants.

II.   All pants are belts.

Conclusion

I.   Some pants being shirts is a possibility.

II.   Some pants are not belts.

OPTIONS
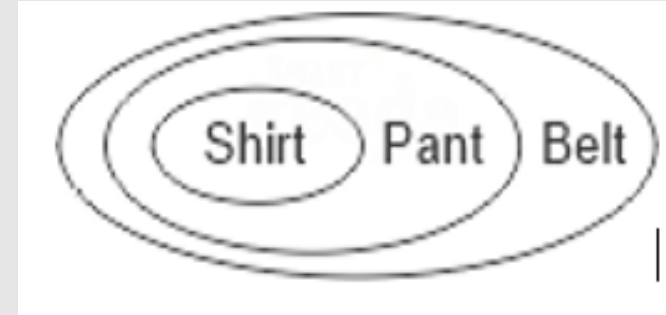
a)   if only conclusion I follows

b)   if only conclusion II follows

c)   if either conclusion I or conclusion II follows.

d)   if neither conclusion I nor conclusion II follows.

e)   if both conclusion I and conclusion II follow.

Converse of first statement: 'Some pants are shirts.' which is a surety and not a possibility. Hence, C1 does not follow.

And conclusion II does not follow either as it's given in the statement II that 'All pants are belts.'

Hence, neither C1 nor C2 follows.

Hence, option D is correct.

EXAMPLE 2

Statement

I.   Some bags are mugs.

II.   All boxes are mugs.

Conclusion

I.   At least some bags are boxes.

II.   All mugs being boxes is a possibility.

III.   OPTIONS

a)   if only conclusion I follows

b)   if only conclusion II follows

c)   if either conclusion I or conclusion II follows.

d)   if neither conclusion I nor conclusion II follows.

e)   if both conclusion I and conclusion II follow.

Some bags are mugs – converse – Some mugs are bags. Now,

All boxes are mugs (A) + Some mugs are bags (I) = A + I = No conclusion. Hence, conclusion I does not follow. There is no negative statement. Hence, the possibility in II exists. Thus, conclusion II follows.

Hence, option B is correct.
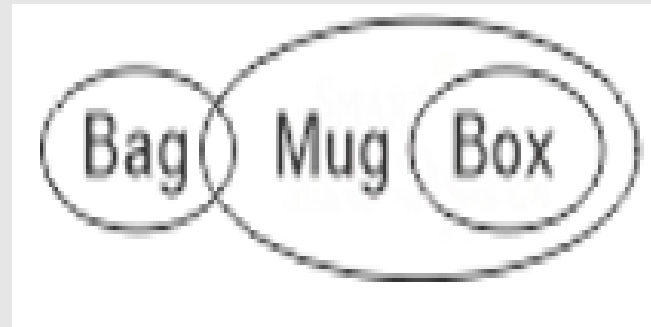
METHOD 2:USING VENN DIAGRAMS

Example1: Which of the two conclusions can be concluded on the basis of given statements?

- Statements:

- Some parrots are scissors.

- Some scissors are not combs.

- Conclusions:

- Some scissors are parrots.

- Some combs are parrots.

Solution: Now, in this case, the possible conclusion is: Some scissors are parrots (I to I), as the universal principal no. 4 says, that with two particular statements only I to I is possible. Therefore, only 1 conclusion is possible. Nothing else is possible.
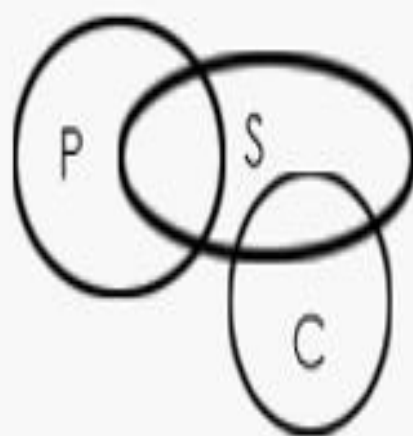
Example 2 : Which of the two conclusions can be concluded on the basis of given statements?

- Statements:

- All flowers are candles.

- All lanterns are candles.

- Conclusions:

- Some flowers are lanterns.
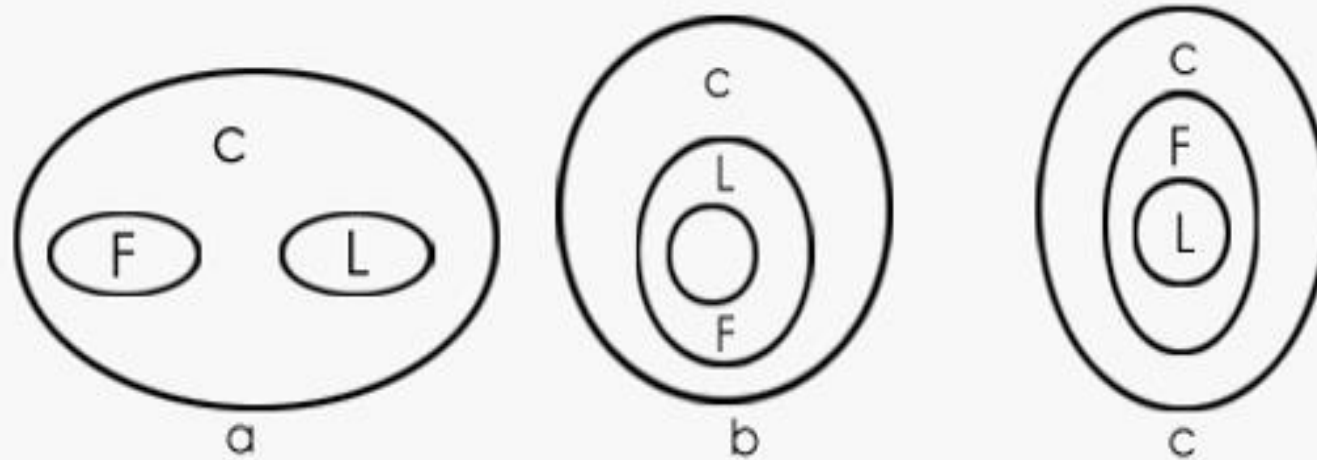
- Some candles are lanterns.

Solution:

Three possible diagrams are shown above for the given statements.

Conclusion I follows from last two possible solutions, but does not follow from the first possible solution.

Therefore, this conclusion is false.

Conclusion II follows from all the three possible solutions.

Therefore, conclusion II is true.

a

b

c

PROBLEMS FOR PRACTICE

Statement

I. All fruits are lions
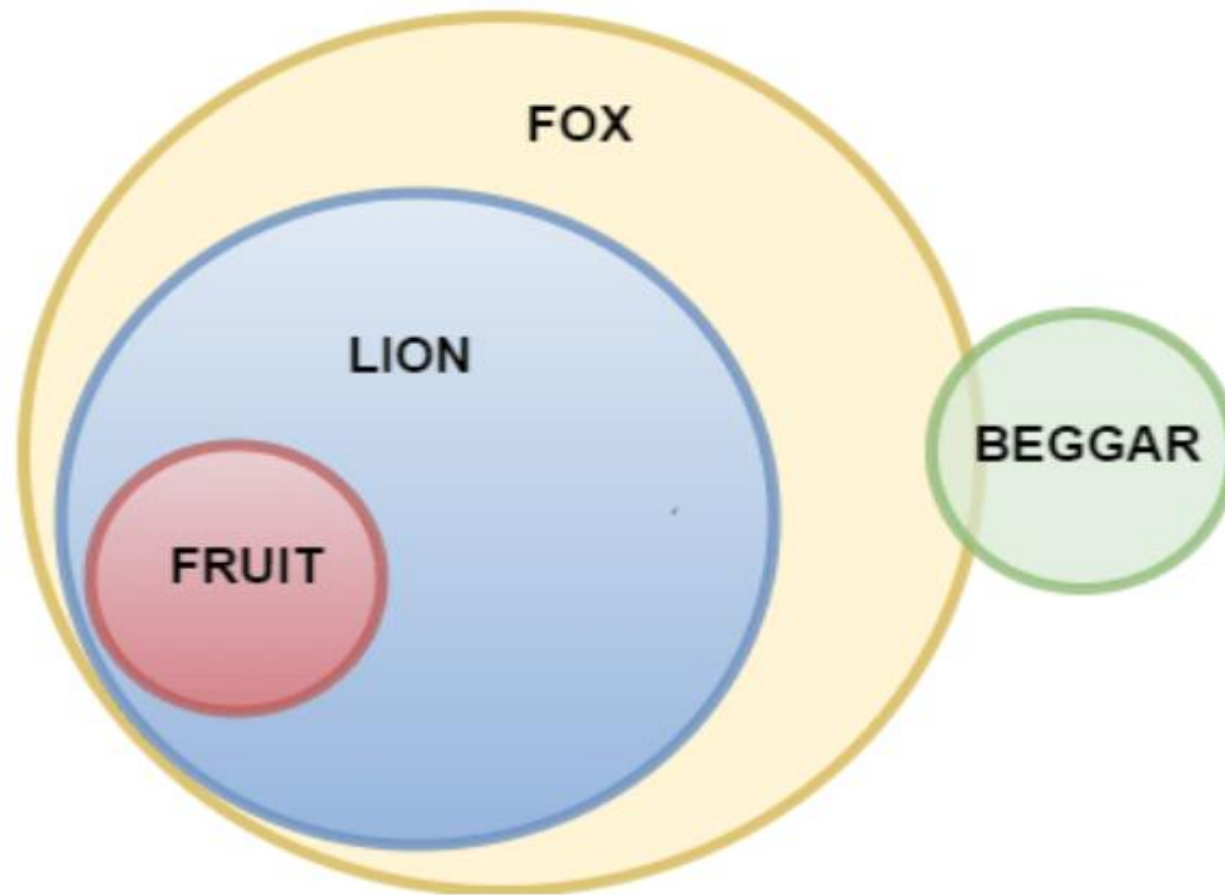II. All lions are foxes
III. Some foxes are beggars

Conclusion

I.   All fruits are foxes.

II.   Some fruits are beggars.

OPTIONS

a. Only I follows

b. Only II follows

c. Only III follows

d. Only I and II follows

e. Both II and III follow

ANSWER: Only I follows

Statement

I. All flowers are toys.
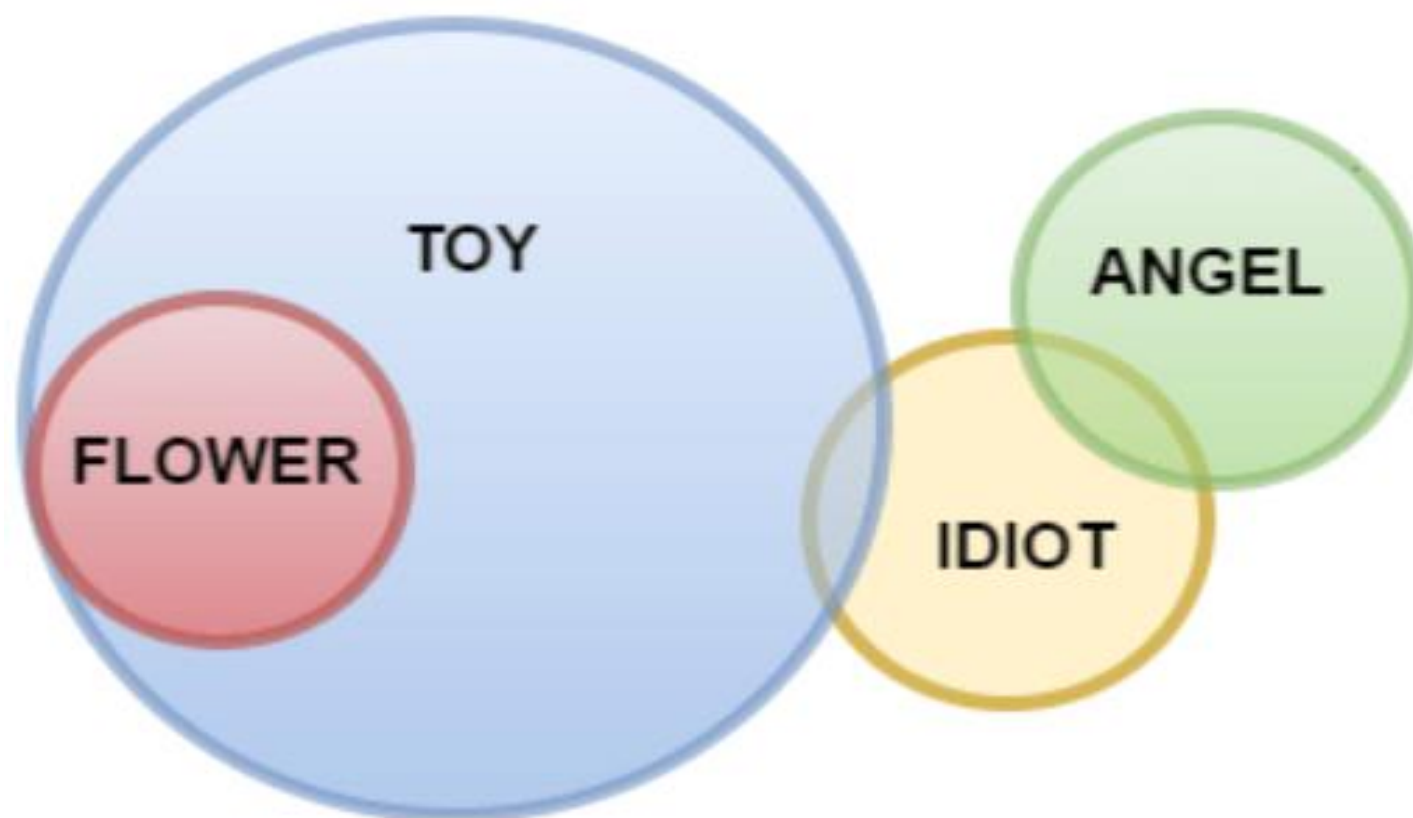II. Some toys are idiots.
III. Some angels are idiots.

Conclusion

I. Some angels are toys.
II. Some idiots are flowers.
III. Some flowers are angels.

OPTIONS

a. Only I follows

b. Only II follows

c. Only III follows

d. Only I and II follows

e. Both II and III follow

Statement

I. Some guns are hammers.
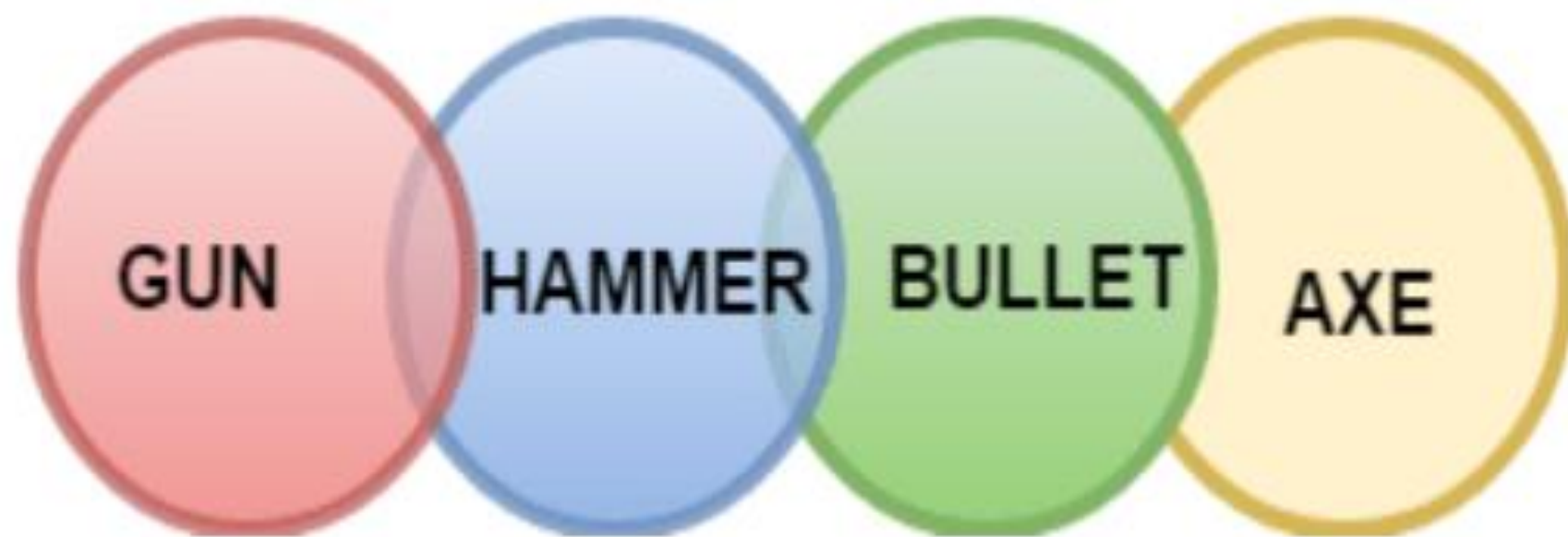II. Some hammers are bullets.
III. Some bullets are axes.

Conclusion

I.   Some axes are hammers.

II.   Some bullets are guns.

III.   Some axes are guns.

OPTIONS
a. Only I follows
b. Only II follows
c. Only III follows
d. Only I and II follows
e. Both II and III follow

ANSWER: None follows

GUN HAMMER BULLET AXE

Statement

I. All cushions are pillows.

II. Some pillows are bolsters.

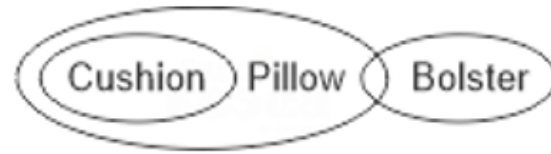**Conclusion**

I. At least some cushions being bolsters is a possibility.

II. Some bolsters are pillows.

OPTIONS

a) if only conclusion I follows

b) if only conclusion II follows

c) if either conclusion I or conclusion II follows.

d) if neither conclusion I nor conclusion II follows.

e) if both conclusion I and conclusion II follow.

Venn Diagram Method:

Analytical Method:

All cushions are pillows (A) + Some pillows are bolsters (I) → Middle term 'Pillows' is not distributed in either of the statements. Therefore, no definite conclusion follows between the classes 'Cushions' and 'Pillows'. Therefore possibility between these classes may exist.

Hence, conclusion I follows.

Now,

Some pillows are bolsters → converse → Some bolsters are pillows.

Hence, conclusion II also follows.

Hence, option E is correct.

Statement

I.   No animal is a dog.

II. Some monkeys are animals.

III. All cats are dogs.

Conclusion

I.   Some animals are monkeys.

II. No cat is an animal.

OPTIONS

a) if only conclusion I follows

b) if only conclusion II follows

c) if either conclusion I or conclusion II follows.

d) if neither conclusion I nor conclusion II follows.

e) if both conclusion I and conclusion II follow.

Venn Diagram Method:

Analytical Method:

Some monkeys are animals (I) - conversion - Some animals are monkeys (I). Hence conclusion I follows.

Again, All cats are dogs (A) + (No animal is a dog (E) -) conversion - No dog is an animal = A + E = E = No cat is an animal.

Hence, conclusion II follows.

Hence, option E is correct.