

(1)

Categorical Propositions

A proposition which either asserts or denies the presence or absence of one class in another, in whole or in parts.

$A \rightarrow$ Universal Affirmative Proposition

$E \rightarrow$ Universal Negative Proposition

$I \rightarrow$ Particular Affirmative Proposition

also Gas
existential proposition $O \rightarrow$ Particular Negative Proposition

e.g. $\frac{\text{All } S \text{ is } P}{\text{Some } S \text{ is } P}$ Quantifier
 $\frac{\text{Some } S \text{ is not } P}{\text{Subject class}} \quad \text{copula} \quad \frac{}{\text{Predicate class}}$

universal } quantity affirmative } quality
 particular } Negative }

Distribution → The notion of distribution tells us that whether the term has been taken in its entire denotation.

(2)

EULER
DIAG

A All S is P



E No S is P



I Some S is P



O Some S is not P

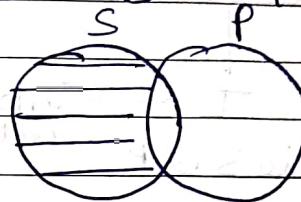


classmate
note

S	✓	X
✓	✓	
X	X	
X		✓

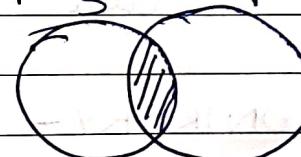
VENN - PEIRCE DIAG

All S is P



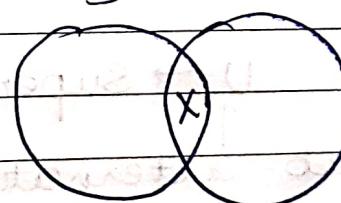
$$SP = 0$$

No S is P



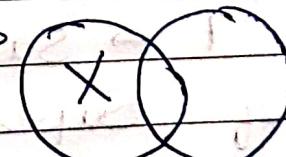
$$SP = 0$$

Some S is P



$$SP \neq 0$$

Some S is not P



$$SP \neq 0$$

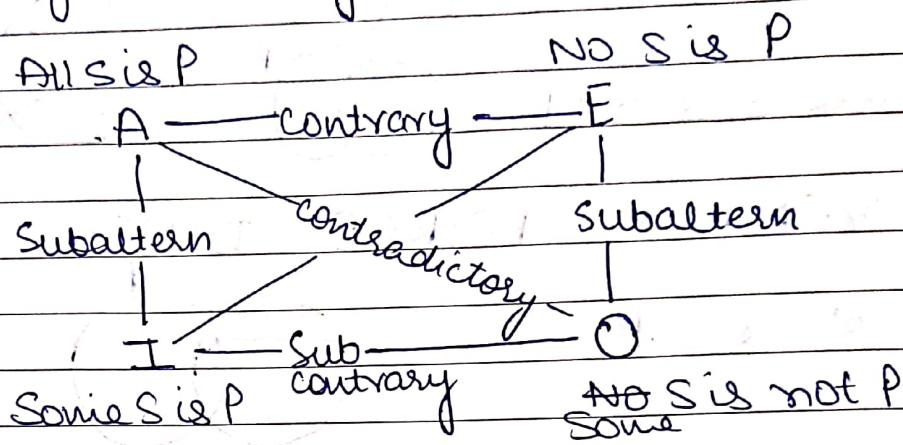
\times represents
presence / Existence

\times represents
presence / Existence

(3)

SQUARE OF OPPOSITION -

- 1) Traditional Square of opposition
 ↳ given by Aristotle.



CONTRARY - Cannot be True together
 Can be false Together

SUB- CONTRARY - Can be True together
 Cannot be false Together

$\cup \rightarrow$ Super altern

↑
Sub-alternation

$P \rightarrow$ Sub altern.

* If Super altern is True then
 sub altern has to be True

* If Sub altern is False, then
 super altern has to be False.

(u)

start
up.
classmate
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P _____

CONTRADICTORY - Neither can be true together nor can be false together.

A ~~universal~~

E ~~existential~~

All S is P

No S is P

($\forall x$) [Sx \supset Px]

($\forall x$) [Sx \supset \neg Px]

I ~~particular~~

O ~~existential~~

Some S is P

Some S is not P

($\exists x$) [Sx \cdot Px]

($\exists x$) [Sx \cdot \neg Px]

2) Modern Square of opp. or re-square of opp.

A ~~universal~~ E ~~existential~~

contradictory - O

I ~~particular~~

existential - H ~~universal~~

G ~~universal~~

H ~~existential~~

M ~~existential~~

N ~~universal~~

F ~~universal~~

P ~~existential~~

ambiguity of terms of sentence

entity vs. substance

(5)

Page

CATEGORICAL

SYLOGISMS

- GT contains 2 premises 2.
- 1 conclusion
- ① It is made of categorical prop.
- 2 Prem.] 3 categorical prop.
1. conc] 1. conc exactly 3 terms
- ② It contains which occurs twice together.

In any standard form of categorical syllogism -

S - Minor Term

P - Major Term

M - Middle Term

mood
 }
 major P. A All M are P

minor P. A All S are M

conc. A All S are P

The arrangement of middle term in the premises is known as Figure.

6

attribution

classmate

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63 P

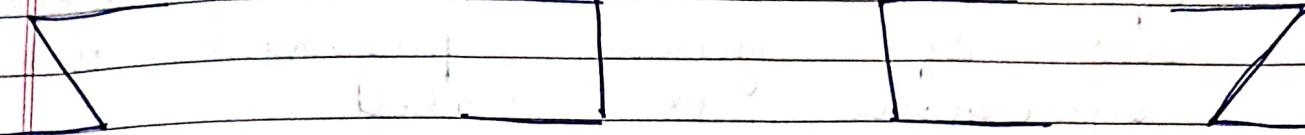
P

S P
S M
S P

P M
S M
S P

M P
M S
S P

P M
M S
S P



Total \rightarrow 256 Syllogism

valid Syl. Figure

Aristotle 14

medieval 24

Modern 15

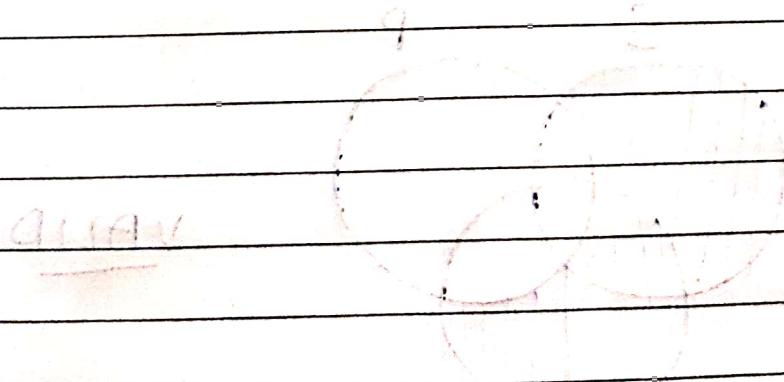
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Contribution

1 2 3 4

O = 12

O = 42



VENN

DIAGRAMS
To test the validity of categorical syllogisms

If you can draw the conclusion out of given premises, the syllogism is valid.

If you cannot draw the conclusion out of given premises, the syllogism is invalid.

AAA - ① Figure
Mood

All M is P

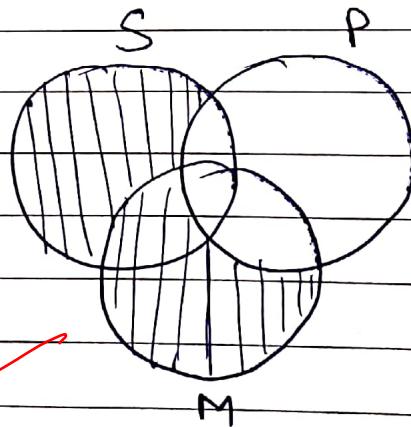
$M\bar{P} = O$

All S is M

$S\bar{M} = O$

All S is P

$S\bar{P} = O$



VALID

AAA - ② Figure

~~Mood~~

All P is M

$P\bar{M} = O$

All S is M

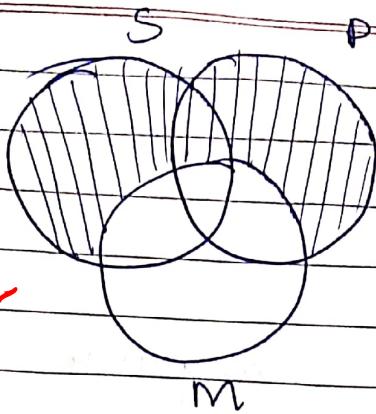
$S\bar{M} = O$

All S is P

$S\bar{P} = O$

Q6

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INVALID

~~AII-I-3~~

All M is P

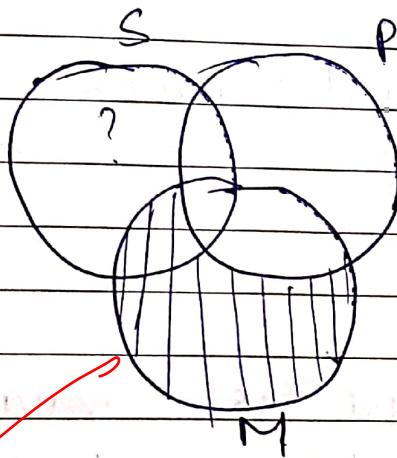
$M\bar{P} = 0$

All M is S

$M\bar{S} = 0$

All S is P

$S\bar{P} = 0$



INVALID

~~AII-I-2~~

All P is M

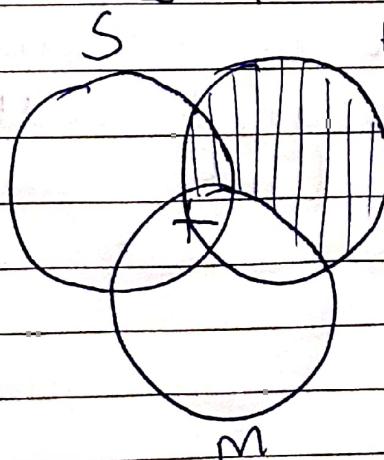
$P\bar{M} = 0$

Some S is M

$S\bar{M} \neq 0$

Some S is P

$S\bar{P} \neq 0$



INVALID



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Not taken in entire denotation

Formal Rules to test the validity of Syllogism (6)

1. Quaternio Terminorum (Fallacy of four terms)

Not actually to test the validity of syllogism but it test whether it is syllogism or not.

e.g. All M is P
All P is S
All J is R

3 Terms occurring twice

2. Undistributed Middle Rule [Fallacy of 7] [undist. middle]

It says that the middle term must be distributed at least once in the premises

All M is P
All M is S
 \therefore All S is P

middle Term is
dist

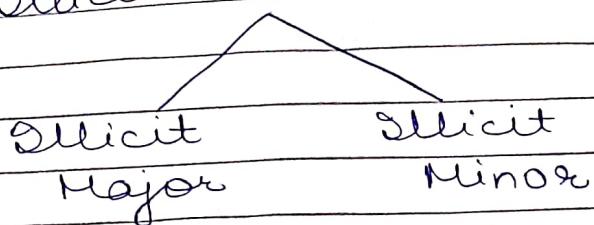
All P is M
All S is M
 \therefore All S is P

middle Term is
not distributed

All M is P
All S is M
All S is P

middle Term is
once distributed.

3. Illicit Process



If a term is distributed in the conclusion, then it must be distributed in its respective premise

All M is P \rightarrow Major Premise

All M is S \rightarrow Minor Premise

All S is P

↓
not dist
in Premises

The term dist in conc. has to be dist in premises not vice versa.

Illicit Major \rightarrow If the major term is dist in conc., it has to be dist in major premise.

Illicit Minor \rightarrow If the minor term is dist in conc., it has to be dist in minor premise.

4. Exclusive Premises

No conc. follows from 2 negative premises.

5. Fallacy of Drawing an affirmative conclusion from a negative premise

A	E	A
E	E	A
All X E/o	X	A

If one premise is affirmative & other negative, then the conc. will be negative.

If ^{two} P ^{are} affirmative, conc. will be affirmative.

6. Existential Fallacy (Boolean Interpretation)
dep. on concept of empty set.
Things can be vacuously true.

NO Particular conclusion follows from 2 universal premises.

U	U	P	Some cats are white Some dogs are white Some cats are dogs X
U	P	P	
U	P	<u>X</u>	

Q. Test the validity of EEA - ② Hood figure.

Sol. ✓ NO ✓
Some P is M
No S is M
All S is P

It shows the fallacy of exclusive premises so it is invalid

P → major
M - middle



13-10-

② AFA - ③

All M is P

All M is S

All S is P

invalid; Illicit minor

③ AA I - ③

All M is P

All M is S

Some S is P

invalid; Illicit major

EYU

UH

Fall

④ IIE - ①

Some M is P

Some S is M

No S is P

✗

invalid; Fallacy of Drawing an affirmative conclusion from negative premise
→ Glueck

fallacy { I I O O }
 fallacy { I I O O }

NO conc follows from 2 part. premises

13-10-19

~~EII-(3)~~

NO M is P
 NO M is S
 Some S is P
 X X

(4) Fallacy Exclusive Premises

(5) Existential fallacy.

construct, schematized and prove the validity or invalidity of the given categorical syllogism

1. Some mafatics are not parasites, but all criminals are parasites; it follows that some mafatics are not criminals.

~~Conclusion Markers;~~

~~it follows, thus, therefore, entails.
so, we may conclude, then, consequently~~

Premise Markers;

but

Conc. because Prem.
and.

categorical Prop - A prop. which either asserts or denies the presence or absence of one class in another, in whole or in parts.

A - Universal

E -

I -

O -

~~Some C is not P~~

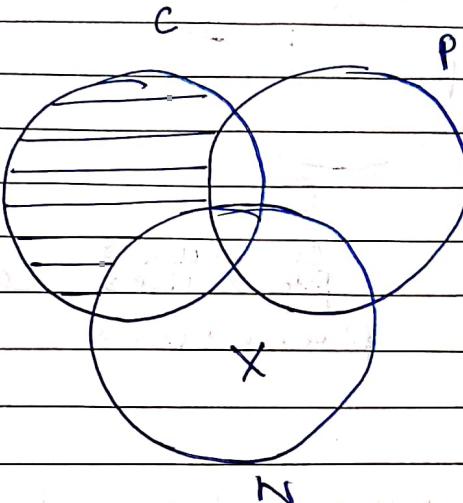
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All C are P $\neg C \bar{P} = 0$
Some N are not P $\neg N \bar{P} \neq 0$

Some N are not C $\neg N \bar{C} \neq 0$

schem
major. atization

It is valid, it follows all the
formal rules.



Since the premises
draw the conclusion,
it is valid

This is AOO - 2 BAROKO

— ✓ —
Mood
=

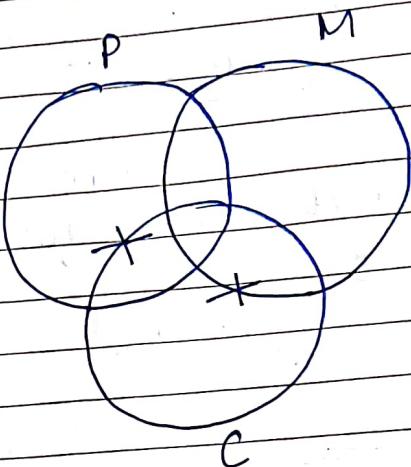
② Some Christians are not methodist, for
some Christians are not protestants and
some protestants are not ~~methodist~~ protestant.

Some C are not M $\neg C \bar{M} \neq 0$
Some C are not P $\neg C \bar{P} \neq 0$

Some C are not M $\neg C \bar{M} \neq 0$
T major

It is invalid because it does not follow the rule of exclusive premises.

cl.



Since the conclusion cannot be drawn from the premises, it is invalid.

2

- (3) All people who live in London are people who drink tea and all people who drink tea are people who like it - we may conclude that all people who live in London like it.

All if :

cl.

~~All supporters of popular govt. are democrates so all supporters of popular govt. are opponents of republican party in as much as all democrats are opponents of republican party~~

All D✓ are O ✗

All S✓ are D ✗

All S✓ are O ✗

It is valid as it follows all the formal rules.

~~Q. Some snakes are not dangerous animals, but all snakes are reptiles and therefore some dangerous animals are not reptiles.~~

All S✓ are R ✗

Some S✓ are not DA ✓

Some DA ✗ are not R ✓

Some S are not DA
All S are R
Some DA are not R

suicit major.

✓ Prove that an affirmative conclusion follows from 2. affirmative premises.

A	A	T	I
A	I	A	I

only ^{prop.} part. Conclusion follows in ③ figure
5th fig. 2nd fig. negative Conclusion follows in ② figure

① Let the conclusion of two affirmatives be a negative prop.

A	A	I	I
A	I	A	I

} undist. fallacy

Informal fallacies

$$\begin{array}{r} A \quad M \quad P \times \\ A \quad S \quad M \\ \hline E \quad S \quad P \\ \hline \end{array}$$

glut
major

$$\begin{array}{r} \overbrace{P \quad M}^{\times} \\ \overbrace{S \quad M}^{\times} \\ \hline \overbrace{S \quad P}^{\times} \\ \hline \end{array}$$

$$\begin{array}{r} \overbrace{M \quad P}^{\times} \\ \overbrace{M \quad S}^{\times} \\ \hline \overbrace{S \quad P}^{\times} \\ \hline \end{array}$$

illicit/
major
minor

$$\begin{array}{r} A \quad M \quad P \times \\ I \quad S \quad M \\ \hline E \quad O \quad S \quad P \\ \hline \end{array}$$

$$\begin{array}{r} \overbrace{P \quad M}^{\times} \\ \overbrace{S \quad M}^{\times} \\ \hline \overbrace{S \quad P}^{\times} \\ \hline \end{array}$$

undist. middle illicit major undist. middle

$$\begin{array}{r} I \quad M \quad P \times \\ A \quad S \quad M \times \\ \hline S \quad P \\ \hline \end{array}$$

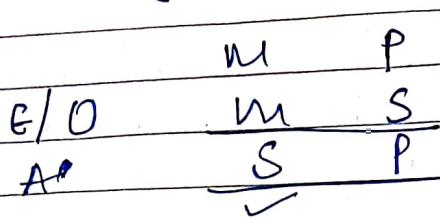
$$\begin{array}{r} \cancel{P \quad M}^+ \\ \cancel{S \quad M}^+ \\ \hline \cancel{S \quad P}^+ \\ \hline \end{array}$$

undist. middle glut
middle major

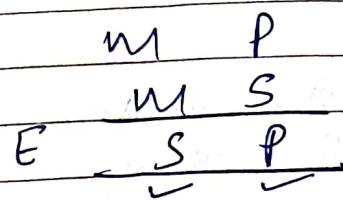
Q3 Negative conclusion in (2) figure.

$$\begin{array}{r} P \quad M \\ \cancel{S} \quad \cancel{M} \\ A \quad I \quad S \quad P \\ \hline \end{array}$$

3rd Fig.



(S) Rule



(U) Rule

IS Syllogism are valid

→ No valid syllogism has middle term distributed twice.

There is no syllogism which has term distributed more than reqd.

Q. Can Any Std. form C.S be valid that contains exactly 3 terms, each of which is distributed in both of its occurrences.

AIA, EAE, AII, EIO → First Figure
(valid)

All have conclusion

also has Perfect Figure

AEE, AAE, AOO, EIO → Second figure
(valid)

AII, IAI, EIO, OAO → Third Figure
(valid)

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AEE, IAI, EAI → Fourth figure valid

Sylogism with same mood have same venn diag.

3 → 12 Distinct Sylogisms

→ Find 24 Sylogisms which will be valid

AAA -① AAA

A	M P	P M	M P
A	S M	S M	M S
A:	S P	S P	

AAA -①,

A AEI

AA O

E E I

E E O

A E I

A E O

EAE -①

EAE -②

APT AII -①

AII -③

EIO -①

EIO -③

AA I

AA O

E E I

E E O

A E I

A E O

DARAPT

PAI

Informal Fallacies

Fallacy → mistake in Reasoning
It is fallacious i.e. having mistake.
Part of Inductive logic.

In Strong & weak arguments, if any argument is extremely weak, it is fallacy.

CLASSIFICATION OF FALLACIES -

1. Fallacies of Relevance

$P_1, P_2, P_3 \xrightarrow{\text{not relevant}} C$

2. Fallacies of Defective induction

3. Fallacies of Presumptions

4. Fallacies of Ambiguity

P_1, P_2, P_3



Defect in line
of reasoning.

Assumption, assumed & on the basis
of assumption to prove something.

more than one meaning of word.
Associated.

Falso c ~~at~~
ad misericordiam

1. Relevance

An informal fallacy where support offered to some type of conclusion is an inappropriate appeal to the emotion e.g. melancholy, patristism, pity.

R₁

Appeal-to Emotion

[also Gas ad Populum]

Red Herring.

An informal fallacy committed when some distraction is used to mislead or confuse

R₂

Straw man

When the position of one opponent is misrepresented and distorted position is made the object of attack.

R₃) Against the person
(Ad hominem)

R₃) Appeal-to force
(baecium)

One attacks the person either abusively, or as a consequence of his/her special circumstances.

P F m OF
R T u OF