Propositional logic

. A Statement is a declarative sentence which can be either true or filse.

· An impertue sentence or questions are not included.
· Propositions are denoted with compital letters, eg.

P.Q.R. They will have a handlaton whereas

P.A. - I'M not.

Connectives

These will change the areasing of a proposition.

P B a well formed formula (aff)

7 p not p

PAQ pand 2

PVQ por 2

P - 9 if P, then 9

Logiz should be in the aftermative

If here is a variable in a sentence her it

is not a skhement.

Truth falles

Negahm

Conjunction (1, &,.)

P	9	PAQ
0	0	0
l	0	٥
1	((
0	t	0

$$\frac{2}{2} \qquad P \wedge q = \min(P, 2)$$

$$2^{\text{number of}}$$

Dis junchian (U.t)

P	9	PV2
0	0	0
l	0	(
1	l	(
\bigcirc	t	ŧ

Con	d.V.mo	1(-	, >)
		P-2	P - 2 = 1 40 = 0 iff p = 9
t	9	7-9	
0	0	0	Only Pilse when P is true and
			q is false.
1	1	1	If it's sunny, & will wear sunseron
0	t	1	when 12149?

Bi cord Hand (=> , =)

ا م ا م ا 0

iff P = 2

Exclusive or (0,0)

P	9	Pv2
0	0	0
l	0	(
1	(0
0	t	

P = 9 then p = 9 = 1

Logically equivalent.

When two propositions have the same values, there they will be logically exercalent.

P	9	78	79	PV 79		
(1	0	6	(\circ	1
(6	O	١	1	ပ	1
0	1	l	0	0	1	(
٥	0	ţ	(1	O	Į

Sheffer Stroke

1 Nand Not and

PTQ Not P and q.

P 99 = 7P

P4967 7 (PA)

PAQ (=> 77 (PAQ)

7 (P19)

(=> (Pra)r(Pra)

PV9 (=>

77P V 779

7 (7P A 7a)

(Prp) rara

Logic Laws

Toulology: T: (Always 1) Contradiction: F: (Always 0)

Identify - Will depend on the value of P PAT (=7 P PV F (=7 P

Donarenton

PUT CETT - AS T WILL always be 1 PNF CETF - AS F WILL always be 0

(PUF) 1 (QUT)

PNT

Double regular

PV9

Distributive Law

Connabbline (U,N)

P N a C=> 9 NP

A 550 ciativity (U,N)

P N (a Nr) (= > (P N2) Nr

11 sance

Inverse Law

P 178 (=> F P 178 (=> T

Conditional Law

P - 9 (=7 7PU9

$$\frac{P + Q + P \rightarrow R}{1 + 1 + 1}$$

$$\frac{1}{1} = 0$$

$$\frac{1}{0} = 0$$

$$\frac{1}{0} = 0$$

$$\frac{1}{0} = 0$$

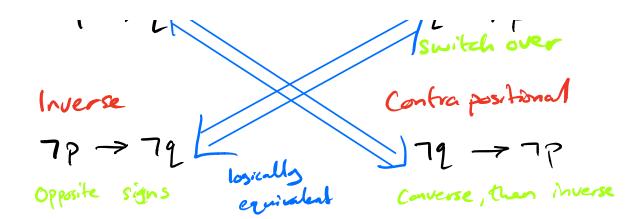
7 (PM) ~1)

(7pv 72) N2

Conditionals

Conditional D -> 4 M

Converse $\rightarrow 0$



9	P	978
0	0	1
O	1	(
1	6	٥
1	ŧ	

79	79	7p->7g
Q	O	1
٥	1	
)	٥	٥
1)	l

Examples

Rules of Inference

- . Taking I or more premises and getting a conclusion.
- (1) Modus Ponens (MPP) P - q
- 2) Modus Tollers (MTT) P -74 79

You can use the contra rule, mereather apply MPP rule.

- (3) HypMehral Syllogism (HS) @ Disjunctive Syllogism (DS) P -> r
 - Pu 2 7p one has to
- taking away the middle wan & Addition U I for Mhoduehin
- 6) Simplification NE :. ? / removal of
- (7) Conjunction NI 1 Inhodichin

P 9 .: P 1 9