Basic logic and proof

logical operation

1) Negation : ~ or ¬ (NOT)

opposite meaning of the statement

Ex : P : Today is Tuesday

¬P : Today is not tuesday

Truth table :

P	¬P
T	F
F	T

(since p=1

General Formula } = $2^2 - 2^1 = 2$

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2) Conjunction : (AND) (∧) cap

If P and Q are true other so it is

Ex : P : surya will go shopping

Q : surya will go Cinema

P/Q : surya will go shopping and cinema

Truth table :

P	Q	P∧Q
T	T	T
T	F	F
F	T	F
F	F	F

3) Disjunction or (v)

If p or q is true
Otherwise it is false

Ex: 21

p: Surya will go shopping
q Surya will go cinema

p v q : Surya will go Shopping and Cinema

p v q: True

Truth table

p	q	p v q
T	T	T
T	F	T
F	T	T
F	F	F

Ex: 2

p: Surya will go shopping
q: Surya will not go cinema

p v q: Surya will go shopping not cinema.

Ex: 3

p: Surya will not go shopping
q: surya will go cinema

p v q: Surya will go cinema not Shopping.

p v q : True

Ex: 4

p: Surya will not go Shopping
q: Surya will not go cinema

p v q: Surya will not go shopping and cinema

p v q: False.

4)

5)

4) conditional: (if than) (→) emplies (or) tense to

If p true and q false

Then p→q False,
otherwise it is true.

p	q	p→q
T	T	T
T	F	F
F	T	T
F	F	T

Ex: 1

p: Gold price is increased
q: sale will be decreased
p→q: If Gold price is increased then the sale will be decreased

p→q : If
p→q : True

5) Biconditionae: (if and only if) (if)↔

The Biconditional means that both p→q, and q→p is true

p↔q is true
otherwise it is False

p	q	p↔q
T	T	T
T	F	F
F	T	F
F	F	T

Ex:
p: If I study had then I will pass
q: And if I pass than I studied hade
p↔q: I will pass if and only if: study hade

6) Joind Denial (NOR) ($\downarrow$)

If both p and q are false, than $p \downarrow q$ is torue, otherwise, it is false

p	q	$p \downarrow q$
T	T	F
T	F	F
F	T	F
F	F	T

7) Meet Denial (NAND) ($\uparrow$)

If both p and q are torue then, $p \uparrow q$ is false, Otherwise it is torue.

p	q	$p \uparrow q$
T	T	F
T	F	T
F	T	T
F	F	T