

Stroke function
 OR

Formal Logic
 GF

Sheffer's Stroke function -

It was given by American logician Henry M. Sheffer. to define negative function. Stroke is symbolized as $'/'$ (italic) and is true if and only if at least one of its component is false.

p	q	p/q
T	T	F
T	F	T
F	T	T
F	F	T

~~Row one~~ Row one is false b/c both of components are true. On the basis of this definition we can define other truth functional relations in following way -

① Conjunction $(p \cdot q) \equiv p/q/p/q$

p	q	$p \cdot q$	p/q	p/q	$p/q/p/q$
T	T	T	F	F	T
T	F	F	T	T	F
F	T	F	T	T	F
F	F	F	T	T	F

Same truth value

② Negation $\neg p \equiv p/p$

p	p/p	$\neg p$
T	F	F
F	T	T

①

Same truth value

③ Disjunction. $(p \vee q) \equiv p/p/q/q$

p	q	p	q	$p \vee q$	p/p	q/q	p/p/q/q
T	T	T	T	T	F	F	T
T	F	T	F	T	F	T	T
F	T	F	T	T	T	F	T
F	F	F	F	F	T	T	F

Same truth value ✓

④ Conditional statement OR Implication

$$(p \supset q) \equiv p/q/q$$

p	q	$p \supset q$	q/q	p/q/q
T	T	T	F	T
T	F	F	T	F
F	T	T	F	T
F	F	T	T	T

Same truth value.

Now Problem Solving.

Define following truth functions in stroke function -

Q-1. $(p \supset q) \vee r$

$$\begin{aligned} \text{Solution} &= (p \supset q) / (p \supset q) / r / r \\ &\equiv p / q / q / p / q / q / r / r \end{aligned}$$

(Ans)

This can be solved in other way also as we

Q. 1. ~~$p \vee (q \supset r)$~~

can start from horse shoe (\supset) .

$$\begin{aligned} \text{Like } \rightarrow & (p \supset q) \vee r \\ \equiv & (p/q/q) \vee r \\ \equiv & p/q/q/p/q/q/r/r \end{aligned}$$

we see that in both way answer is same.

Q. 2. $p \vee (q \supset r)$

$$\begin{aligned} \equiv & p \vee (q/q \supset r) \\ \equiv & p \vee (q/q/r/r) \\ \equiv & p/p/q/q/r/r/q/q/r/r \end{aligned} \quad \text{Ans}$$

Q. 3. $(p \supset q) \cdot (q \supset p)$

$$\begin{aligned} \equiv & (p/q/q) \cdot (q/p/p) \\ \equiv & p/q/q/q/p/q/p/q/q/p/p \end{aligned}$$

Q. 4. $\neg (q \supset p)$

$$\begin{aligned} \equiv & (q \supset p) / (q \supset p) \\ \equiv & q/p/p/q/p/p \end{aligned}$$

Dear student, when you define a truth function in stroke function, then you have to convert all σ truth functional relations like \cdot, \vee, \supset into stroke symbols '/' (slash or ilalic).

Now practice following questions.

PRACTICE -

1. $(p \supset q) \vee p$

2. $\neg p \supset (q \cdot \neg)$

3. $(\neg p \supset q) \vee \neg$

4. $(p \equiv q)$

5. $(p \vee \neg q) \cdot \neg$

Formal Logic (GLE)

Sem- 2

All Honours Courses

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