

→ Duality :- \wedge & \vee interchange

(ii) $\neg (P \wedge Q) \vee (P \wedge \neg (Q \vee \neg S))$
is $(P \vee Q) \wedge (P \vee \neg (Q \wedge \neg S))$

Eg:- (i) Dual of $P \wedge (Q \vee (R \vee S))$
is $(P \vee Q) \wedge (R \wedge S)$

(iii) If $S^*(P, Q)$ is dual of statement $S(P, Q)$ then :-
(a) $S^*(\neg P, \neg Q) \equiv \neg S(P, Q)$
(b) $\neg S^*(P, Q) \equiv S(\neg P, \neg Q)$

For conditional statement
 $P \rightarrow Q$

- (i) Converse of $P \rightarrow Q$ is $Q \rightarrow P$ (ii) Inverse of $P \rightarrow Q$ is $\neg P \rightarrow \neg Q$
(ii) Contra positive of $P \rightarrow Q$ is $\neg Q \rightarrow \neg P$.

→ Negation of Quantified Statements :-

- (1) None is negation of 'atleast one' or 'some' or 'few'.
(2) Negⁿ of "some A are B" or "there exist $A \subseteq B$ " is "No A are B"
or "There does not exist any $A \subseteq B$ ".
(3) Negⁿ of "All A are B" is "some A are Not B".

Eg:- There exist a boy in class who is smart.
Ans. No boy in class is smart.