Monday, October 4, 2021 9:38 PM

Lecture 8: Q2 p 70 Exercise.

"if George does not have eight legs then he is not an insect".

"George is an insect"

"George has eight legs".

P.

$P \to Q$

$\neg P \to \neg Q$ by MT.

Q

$\therefore P$.

Principle of Resolution: P 64.

Literal: A propositional variable or its Negation.

Clause: A disjunction of literals.

$P \vee Q$ $\neg P \vee Q$

$\neg P \vee \neg \vee Q$

$P \to Q = \neg P \vee Q$.

$P \wedge Q = P, Q$

Ex P65

P1 P

P2 $P \to Q$

C. $\therefore Q$

C1 P ✓

C2 $\neg P \vee Q$. ✓

C3 $\neg Q$. ✓

from C1, C2. Q — 4 ✓

from C1, C2. Q — 4 ✓

from C3, 4 □ — 5.

$P \to Q = \neg P \vee Q$.

Ex11-65 p1 $T \to M \vee E$ C1 $\neg T \vee M \vee E$ ✓

p2 $S \to \neg E$ C2 $\neg S \vee \neg E$ ✓

p3 $T \wedge S$ C3 T ✓

C. $\therefore M$. C4 S ✓

C5 $\neg M$. ✓

from C1, C2. $\neg T \vee M \vee \neg S$ — ✓6

from C3, 6 $M \vee \neg S$ — ✓7

from C4, 7. M — ✓8

fm C5, 8 □ — 9.

Ex6: P62 p1 $\neg P \wedge Q$. C1 $\neg P$ ✓

p2 $\delta \to P$. C2 Q.

p3 $\neg \delta \to S$ C3 $\neg \delta \vee P$ ✓.

p4 $S \to t$. C4 $\delta \vee S$ ✓

C. $\therefore t$. C5 $\neg S \vee t$ ✓

C6 $\neg t$. ✓

from C1, C3 $\neg \gamma$ — 7 ✓

from C4, 7. S — 8 ✓

fm C5, 8 t — 9 ✓

from C5,8 t —— 9 ✓

from C6,9 □

Ex 7 - P 62 :-

P1 $p \to q$

P2 $\neg p \to \gamma$

P3 $\gamma \to s$

C. $\therefore \neg q \to s$.

C1 $\neg p \vee q$ ✓

C2 $p \vee \gamma$ ✓

C3 $\neg \gamma \vee s$ ✓

C4 $\neg q$ ✓

C5 $\neg s$ ✓

from C1,C2 $q \vee \gamma$ — 6 ✓

from C3,6 $q \vee s$ — 7 ✓

from C4,7. s — 8 ✓

from C5,8. □

Ex 8 (63).
= Ex 11 (65).

Ex 9 → P 62 :-

P1 $L \to A$

P2 $E \to \neg I$

P3 $A \to E$

C $\therefore L \to \neg I$.

C1 $\neg L \vee A$ ✓

C2 $\neg E \vee \neg I$ ✓

C3 $\neg A \vee E$ ✓

C4 L ✓

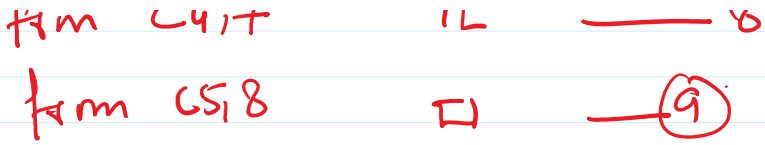
C5 I ✓

from C1, C3 $\neg L \vee E$ — 6 ✓

from C2,6 $\neg L \vee \neg I$ — 7 ✓

from C4,7 $\neg I$ —— 8 ✓

from C5,8 —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