

CSCI1323 Quiz 1 Key

Question 1

A valid argument is when all premises are true and the conclusion is also true. We can rewrite the argument as:

$$\begin{array}{l}
 P \\
 P \rightarrow Q \\
 S \vee R \\
 \underline{R \rightarrow \neg Q} \\
 S \vee T
 \end{array}$$

Step		Reason
1	P	Given
2	$P \rightarrow Q$	Given
3	Q	1, 2 Modus Ponens
4	$R \rightarrow \neg Q$	Given
5	$\neg R$	4, 3 Modus Tollens
6	$S \vee R$	Given
7	S	5, 6 Disjunctive Syllogism
8	$S \vee T$	7 Disjunctive Amplification

Question 2

$$\begin{array}{l}
 (\neg P \vee Q) \rightarrow R \\
 R \rightarrow (S \vee T) \\
 \neg S \wedge \neg U \\
 \underline{\neg U \rightarrow \neg T} \\
 P
 \end{array}$$

Step		Reason
1	$\neg S \wedge \neg U$	premise 3
2	$\neg S, \neg U$	Conjunctive Simplification
3	$\neg U \rightarrow \neg T$	premise 4
4	$\neg T$	3, 2 Modus Ponens
5	$\neg S \wedge \neg T$	2, 4 Conjunction
6	$\neg(S \vee T)$	5 De Morgan's Law
7	$R \rightarrow (S \vee T)$	premise
8	$\neg R$	6, 7 Modus Tollens
9	$(\neg P \vee Q) \rightarrow R$	Given
10	$\neg(\neg P \vee Q)$	8, 9 Modus Tollens
11	$\neg\neg P \wedge \neg Q$	10 De Morgan's Law
12	$P \wedge \neg Q$	Double Negation
13	P	Conjunctive Simplification