

Logica (a.a. 2013-2014 – I semestre)

Esame intermedio – Soluzioni

Versione A

A.1. $(\sim P \vee C) \& \sim(\sim P \rightarrow C), \sim C \& \sim S \vdash S$

A.2. $((S \rightarrow U) \vee (\sim U \rightarrow O)) \vee ((\sim O \& \sim U) \rightarrow \sim T), S \& U \vdash T \vee \sim O$ oppure

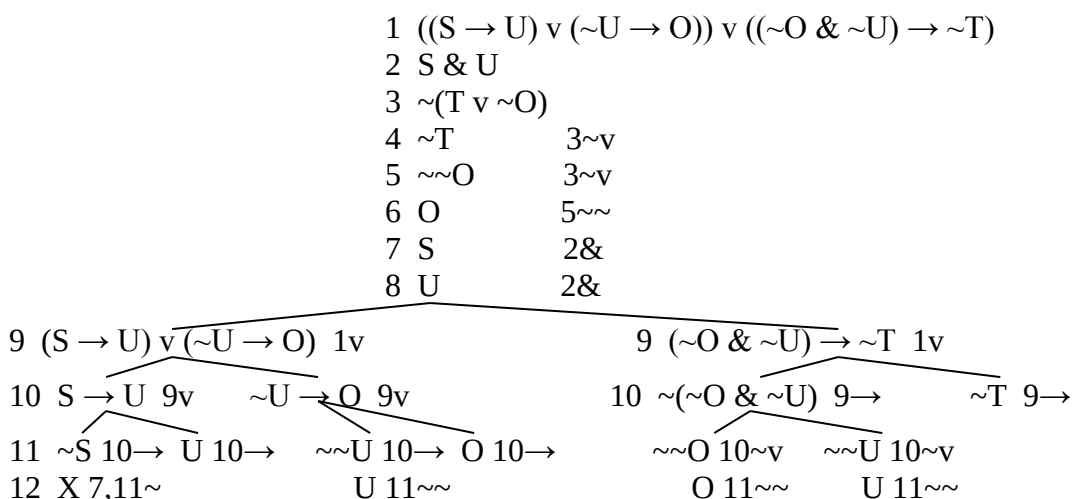
$(S \rightarrow U) \vee (\sim U \rightarrow O) \vee ((\sim O \& \sim U) \rightarrow \sim T), S \& U \vdash T \vee \sim O$

B. $(\sim P \vee C) \& \sim(\sim P \rightarrow C), \sim C \& \sim S \vdash S$

P	C	S	($\sim P \vee C$)	$\&$	$\sim(\sim P \rightarrow C)$	$\sim C$	$\&$	$\sim S$	$\vdash S$
V	V	V	F	V	V	F	F	F	V
V	V	F	F	V	V	F	F	F	V
V	F	V	F	V	F	F	F	F	V
V	F	F	F	V	F	F	F	F	V
F	V	V	V	F	V	V	F	F	V
F	V	F	V	F	V	V	F	F	V
F	F	V	V	F	V	F	V	F	V
F	F	F	V	F	V	F	V	F	V

La forma argomentativa è invalida, come si evince dal controesempio alla riga 8.

C. $((S \rightarrow U) \vee (\sim U \rightarrow O)) \vee ((\sim O \& \sim U) \rightarrow \sim T), S \& U \vdash T \vee \sim O$



La forma argomentativa è invalida, poiché restano dei cammini aperti.

D.1. $P \rightarrow M, P \ \& \ \sim M \vdash M \ \& \ \sim M$

1	$P \rightarrow M$	A
2	$P \ \& \ \sim M$	A
3	P	2 &E
4	M	1,3 $\rightarrow$ E
5	$\sim M$	2 &E
6	$M \ \& \ \sim M$	4,5 &I

D.2. $P \rightarrow \sim M, S \rightarrow P \vdash S \rightarrow (H \vee \sim M)$

1	$P \rightarrow \sim M$	A
2	$S \rightarrow P$	A
3	S	H ($\rightarrow$ I)
4	P	2,3 $\rightarrow$ E
5	$\sim M$	1,4 $\rightarrow$ E
6	$H \vee \sim M$	5 $\vee$ I
7	$S \rightarrow (H \vee \sim M)$	3-6 ($\rightarrow$ I)

Versione B

A.1. $(C \rightarrow \sim P) \ \& \ (P \rightarrow \sim M), M \leftrightarrow (P \vee \sim C) \vdash \sim(M \vee C)$

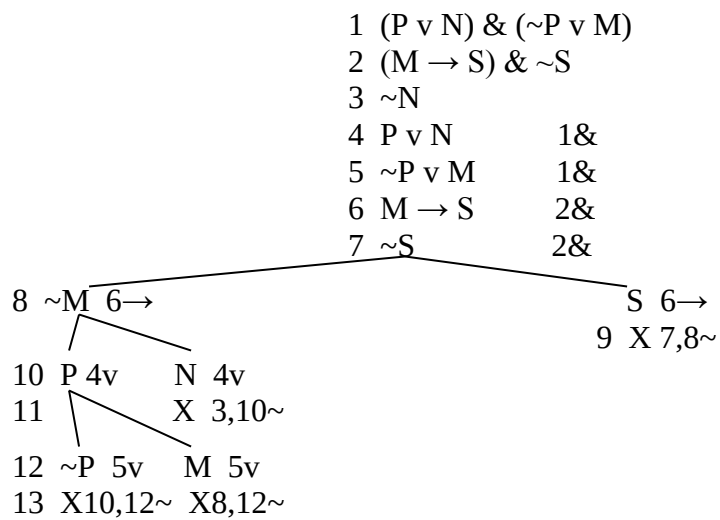
A.2. $(P \vee N) \ \& \ (\sim P \vee M), (M \rightarrow S) \ \& \ \sim S \vdash N$

B. $(C \rightarrow \sim P) \ \& \ (P \rightarrow \sim M), M \leftrightarrow (P \vee \sim C) \vdash \sim(M \vee C)$

C	P	M	(C → ~ P)				&	(P → ~ M), M ↔ (P ∨ ~ C)				¬ (M ∨ C)									
V	V	V	V	F	F	V	F	V	F	F	V	V	V	V	F	V	F	V	V	V	
V	V	F	V	F	F	V	F	V	V	V	F	F	F	V	V	F	V	F	F	V	V
V	F	V	V	V	V	F	V	F	V	F	V	V	F	F	F	F	V	F	V	V	V
V	F	F	V	V	V	F	V	F	V	V	F	F	V	F	F	F	V	F	F	V	V
F	V	V	F	V	F	V	F	V	F	F	V	V	V	V	V	V	F	F	V	V	F
F	V	F	F	V	F	V	V	V	V	V	F	F	F	V	V	V	F	V	F	F	F
F	F	V	F	V	V	F	V	F	V	F	V	V	V	F	V	V	F	F	V	V	F
F	F	F	F	V	V	F	V	F	V	V	F	F	F	F	V	V	F	V	F	F	F

La forma argomentativa è invalida, come si evince dai controesempi alle righe 4 e 7.

C. $(P \vee N) \ \& \ (\sim P \vee M), (M \rightarrow S) \ \& \ \sim S \vdash N$



La forma argomentativa è valida: non rimangono cammini aperti.

D.1. $P \leftrightarrow Q, \sim Q \& P \vdash Q \& \sim Q$

1	$P \leftrightarrow Q$	A
2	$\sim Q \& P$	A
3	P	2 &E
4	$P \rightarrow Q$	1 $\leftrightarrow$ E
5	Q	3,4 $\rightarrow$ E
6	$\sim Q$	2 &E
7	$Q \& \sim Q$	5,6 &I

D.2. $B \rightarrow \sim\sim C, A \rightarrow B \vdash A \rightarrow C$

1	$B \rightarrow \sim\sim C$	A
2	$A \rightarrow B$	A
3	A	H ($\rightarrow$ I)
4	B	2,3 $\rightarrow$ E
5	$\sim\sim C$	1,4 $\rightarrow$ E
6	C	5 $\sim$ E
7	$A \rightarrow C$	3-6 ($\rightarrow$ I)