

Tree System Practice Problems  
PHIL 422  
Woodbridge

I. Theorems, anti-theorems, and neutrals. Use trees to test the following wffs.

1.  $((P(a) \wedge \neg P(a)) \rightarrow Q(a))$
2.  $((P(a) \vee Q(b)) \leftrightarrow \neg(\neg Q(b) \wedge \neg P(a)))$
3.  $\neg(P(a) \vee (\neg Q(b) \wedge P(a)))$
4.  $(Q(a) \vee (Q(b) \vee Q(c)))$
5.  $\neg(P(a) \vee (\neg Q(b) \vee \neg P(a)))$

II. Compatibles and Incompatibles. Use trees to test the following sets.

1.  $\{ \neg(P(a) \rightarrow Q(b)), \neg(P(a) \vee Q(a)), (R(a) \rightarrow Q(b)), \neg Q(b) \}$
2.  $\{ (P(a) \rightarrow Q(b)), (Q(b) \rightarrow R(c)), (R(c) \rightarrow S(d)), (\neg S(d) \wedge P(a)) \}$
3.  $\{ (P(a) \rightarrow Q(a)), (Q(a) \leftrightarrow R(a)), (\neg R(a) \rightarrow \neg P(a)) \}$
4.  $\{ (P(a) \vee Q(a)), (Q(a) \rightarrow R(a)), (\neg R(a) \rightarrow \neg P(a)), (R(a) \vee S(a)) \}$

III. Establishments and Non-establishments. Use trees to test the following.

1.  $\{ P(a) \wedge Q(b), (P(a) \rightarrow R(a)), \neg R(a) \} \vdash S(b)$
2.  $\{ \neg(P(a) \leftrightarrow Q(a)) \} \vdash (P(a) \rightarrow \neg Q(a))$
3.  $\{ (P(a) \vee P(b)), (P(a) \leftrightarrow Q(a)), (P(b) \leftrightarrow Q(b)) \} \vdash (Q(a) \wedge Q(b))$
4.  $\{ (P(a) \vee P(b)), \neg(Q(a) \vee P(b)) \} \vdash \neg(Q(a) \vee P(a))$

IV. Coupled and Uncoupled. Use trees to test the following pairs as couples.

1.  $\neg(P(a) \leftrightarrow Q(a)), (\neg P(a) \leftrightarrow Q(a))$
2.  $(P(a) \rightarrow Q(a)), \neg(P(a) \wedge \neg Q(a))$
3.  $\neg(P(a) \wedge \neg Q(a)), (\neg P(a) \vee \neg \neg Q(a))$
4.  $\neg \neg \neg \neg \neg \neg P(a), \neg \neg \neg \neg \neg \neg \neg P(a)$

These are purely practice problems! I'll post a homework assignment soon.