EXAM 1 **PHILOSOPHY 230**
FALL 2008

NAME: <KEY>

I. Translate the following arguments into the language of statement logic (*SL*) using the suggested capital letters to represent simple statements. In your translation, make sure you indicate which of the statements is the conclusion. (20 points)

1. ***A***merican foreign policy is bankrupt unless it is based on clear ***m***oral principles. American foreign policy is not based on clear moral principles just in case it is based primarily on the ***n***ational interest. Unfortunately, American foreign policy is based primarily on the national interest. We may conclude that American foreign policy is bankrupt. (A, M, N)

$A \vee M$

$\sim M \leftrightarrow N$

N

$\therefore A$

2. If the ***e***quatorial rain forests produce oxygen used by Americans, then either Americans ought to ***p***ay for the oxygen, or they ought to ***s***top complaining about the destruction of the rain forests. But either it is false that Americans ought to pay for the oxygen, or it is false that Americans ought to stop complaining about the destruction of the rain forests. Therefore, it is false that the equatorial rain forests produce oxygen used by Americans. (E, P, S)

$E \rightarrow (P \vee S)$

$\sim P \vee \sim S$

$\therefore \sim E$

II. **Using a *full* truth table, determine whether the following statement is a TAUTOLOGY, SELF-CONTRADICTORY, or CONTINGENT. (14 points)**

3. $(G \,\&\, H) \,\&\, (G \rightarrow \sim H)$

G	H	(G & H)	&	(G → ~H)
T	T	T	F	F
T	F	F	F	T
F	T	F	F	T
F	F	F	F	T

SELF-CONTRADICTORY

III. **Using a *full* truth table, determine whether the following statements are EQUIVALENT, MUTUALLY CONTRADICTORY, or NEITHER. (14 points)**

4. $I \rightarrow (I \rightarrow \sim J)$ $\quad$ $(I \rightarrow \sim J) \vee \sim I$

I	J	I → (I → ~J)	(I → ~J) v ~I
T	T	T F F F	F
T	F	T T T T	T
F	T	T	T
F	F	T	T

EQUIVALENT

IV. Using a *full* truth table, determine whether the following statements are CONSISTENT or INCONSISTENT. (14 points)

5. $K \,\&\, \sim L$ $\qquad\qquad$ $\sim(K \rightarrow L)$

K	L	K & ~L	~(K → L)
T	T	T (F) F	(F) T
T	F	T (T) T	(T) F ✓
F	T	F (F) F	(F) T
F	F	F (F) T	(F) T

CONSISTENT

V. Using a *full* truth table, determine whether the following argument is VALID or INVALID. (14 points)

6. $\sim M \vee \sim N$
   $\sim N \,\&\, \sim M$
   $\therefore N \rightarrow M$

M	N	~M ∨ ~N	~N & ~M	N → M
T	T	(F)	(F)	T (T) T
T	F	(T)	(F)	F (T) T
F	T	(T)	(F)	T (F) F ←
F	F	(T)	(T)	F (T) F

VALID

VI. **Using a *brief* truth table, determine whether the following argument is VALID or INVALID. (12 points)**

7. $(D \vee E) \rightarrow \sim B$
   $G \vee \sim F$
   $O \,\&\, (D \leftrightarrow G)$
   $\therefore F \rightarrow \sim(B \,\&\, O)$

$(D \vee E) \rightarrow \sim B$	$G \vee \sim F$	$O \,\&\, (D \leftrightarrow G)$	$F \rightarrow \sim(B \,\&\, O)$
T (F) F F	T (T) F F	T (T) T T T	T (F) F T T T

VALID

VII. **Using a *brief* truth table, determine whether the following statement is a TAUTOLOGY. (12 points)**

8. $S \rightarrow [\sim(Y \,\&\, S) \rightarrow Y]$

$S \rightarrow [\sim(Y \,\&\, S) \rightarrow Y]$
T (F) T F F F F F

NOT A TAUTOLOGY