☞ Name _____ Section _____

Philosophy 57 — Quiz # 6

(solutions posted 05/06/03)

1 True/False (Circle the Correct Answer)

Ⓣ F 1. A compound statement contains at least one simple statement as a component.

T Ⓕ 2. The tilde ($\sim$) is the logical operator that signifies disjunction.

T Ⓕ 3. In the conditional statement "Bob's constant overeating is a sufficient condition for his always having a stomach ache" the antecedent is "Bob always has a stomach ache."

4. Each of the following is a well-formed formula (*i.e.*, a WFF, or a sentence) of propositional logic:

Ⓣ F (a) "$(S \bullet T) \vee (\sim U \bullet W)$"

T Ⓕ (b) "$(E \sim F) \vee (W \equiv X)$"

Ⓣ F (c) "$\sim(F \vee \sim G) \supset [(A \equiv E) \bullet \sim H]$"

T Ⓕ (d) "$M(N \supset Q) \vee (\sim C \bullet D)$"

Ⓣ F (e) "$((R \equiv S) \bullet T) \supset \sim(\sim W \bullet \sim X)$"

T Ⓕ (f) "$(F \equiv \sim Q) \bullet (A \supset E \vee T)$"

Ⓣ F (g) "$\sim\sim\sim X$"

2 Translations from English into PL

Instructions. Translate the following English sentences into symbolizations of propositional logic, using the following capital letters A = Al goes to town, B = Betty goes to town, C = Cathy goes to town. Write your **final answer** in space provided.

1. English: Al and Betty do not both go to town.

   PL: $\sim(A \bullet B)$

2. English: Either Al or Cathy does not go to town, but Betty does go.

   PL: $(\sim A \vee \sim C) \bullet B$

3. English: If Al or Betty goes to town, then Cathy does~~n~~ not go. [Note: the "n" in "doesn" was a typo.]

   PL: $(A \vee B) \supset \sim C$

4. English: Al does not go to town if and only if both Betty and Cathy do.

   PL: $\sim A \equiv (B \bullet C)$

5. English: Al goes to town only if Betty and Cathy go to town.

   PL: $A \supset (B \bullet C)$

6. English: Either Al or Betty or Cathy goes to town.

   PL: $(A \vee B) \vee C$ or $A \vee (B \vee C)$ [These are equivalent, but we must always group 3-atom statements.]

7. English: Al, Betty, and Cathy all go to town.

   PL: $(A \bullet B) \bullet C$ or $A \bullet (B \bullet C)$ [These are equivalent, but we must always group 3-atom statements.]

8. English: Al does not go to town if Betty does.

   PL: $B \supset \sim A$

9. English: Al goes to town and Betty does not go to town, or Cathy goes to town.

   PL: $(A \bullet \sim B) \vee C$

10. English: Either Al goes to town or neither Betty nor Cathy goes to town.

    PL: $A \vee \sim(B \vee C)$ or $A \vee (\sim B \bullet \sim C)$