Thursday, April 9, 2009

Clarion University – Venango Campus
Logic & Inquiry: Chapter 6 Quiz

All questions are worth 10 points each. Use the lined paper supplied with this quiz as it will be easier for me to read the lines of your truth tables.

I. Given that A and B are true and X and Y are false, determine the truth values of the following complex propositions. Show your work and circle the answer.

1. $[(A \supset X) \mathbf{V} (Y \supset B)] \equiv \sim[(A \mathbf{V} X) \bullet (B \mathbf{V} Y)]$

2. $[(A \bullet X) \mathbf{V} (B \bullet \sim Y)] \supset [(A \equiv \sim X) \bullet (Y \equiv \sim B)]$

II. Use truth tables to determine whether the following propositions are tautologous, self-contradictory or contingent. Show all of your work.

3. $(A \supset B) \equiv \sim(B \mathbf{V} \sim A)$

4. $(A \supset B) \supset [(A \vee B) \supset B]$

III. Use truth tables to determine whether the following pair of propositions are logically equivalent, contradictory, or consistent.

5. $(A \bullet \sim B) \mathbf{V} (B \bullet \sim A)$ $(B \supset \sim A) \bullet (\sim B \supset A)$

IV. Determine whether the following arguments are valid or invalid by constructing an ordinary (i.e., long) truth table for each. If an argument is invalid, circle the pertinent truth values.

6. $A \equiv \sim B / A \mathbf{V} B // B \bullet \sim A$

7. $A \supset B / B \supset C / A \vee C // B \mathbf{V} C$

V. Use an indirect truth table (short truth table – Section 6.5) to determine whether the following argument is valid or invalid.

8. $(A \bullet B) \vee (C \bullet D) / B \supset (E \bullet F) / D \supset (G \bullet H) // F \mathbf{V} H$

VI. First symbolize and then identify the forms of the following arguments. All those without a specific name are invalid. For these write "invalid".

9. Mr. Jones intends to buy either a Ford or a Chevrolet. But he doesn't intend to buy a Ford. Therefore, he intends to buy a Chevrolet.

10. If there is a prowler in the yard, then the dog will bark. Since the dog is barking we may conclude that there is a prowler in the yard.

Extra Credit: If the city is to prevent excessive accidents, then it must salt the streets during the winter; but if it is to avoid damaging the cars, then it must not salt the streets. Since the city must do one or the other, either it won't prevent excessive accidents or it won't avoid damaging the cars.