

Logic I
Fall 2009
Quiz 2
10/1/2009

- For questions 2 and 3, Let Γ be a set of SL sentences and \mathbf{P} an SL sentence.
- If you cannot complete the derivations in 4 and 5, you may earn partial credit if your partial proof demonstrates that you have an adequate strategy.

1. (a) (5 pts.) Is the argument below truth-functionally valid?

$$\frac{\sim (A \supset (B \vee A))}{\sim B}$$

(b) (20 pts.) Prove your answer is correct with a truth-table. Indicate the lines of the truth-table that prove your claim.

2. (a) (5 pts.) If Γ is truth-functionally consistent and Γ truth-functionally entails \mathbf{P} , could $\Gamma \cup \{\mathbf{P}\}$ be truth-functionally inconsistent?

(b) (10 pts.) Why?

3. (15 pts.) Prove the following: If $\Gamma \cup \mathbf{P}$ is truth-functionally inconsistent, then the argument whose premises are the members of Γ and whose conclusion is $\sim \mathbf{P}$ is truth-functionally valid.

4. (20 pts.) Prove the following in SD: $\{(A \& B) \vee (B \& C)\} \vdash A \vee (B \& C)$

5. (a) (5 pts.) Is the argument below valid in SD?

$$\frac{A \quad \sim A}{\sim (A \& \sim A)}$$

(b) (20 pts.) Prove your answer is correct.

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