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PHI 210 Weekly Assignment #5

Name:

C Number:

Due Date: 2020/10/3 11:59 PM

I.Truth-trees method (2pts):

(a) Construct truth-tree for following sequents and decide whether the following sequent is valid or not. If the sequent is invalid, please write down one IPLI.

1. $P \rightarrow Q, Q \rightarrow P : P$

2. $S \leftrightarrow T, S : T$

(b) Construct truth-trees for following sequents and decide whether the following statement is true or not.

1. Is $\{L, M \And B\} \vDash Q$? (Hint: you can read the question as asking: is Q the semantic consequence of set $\{L, M \And B\}$?)

2. Is $\{P \rightarrow Q, \sim Q\} \vDash \ \sim P$? (Hint: you can read the question as asking: is $\sim P$ the semantic consequence of set $\{P \rightarrow Q, \sim Q\}$?)

II.Natural deduction: construct a proof from premises to the conclusion of the sequent below by rule of inference you've learned in the class. (3pts)

1. $(P \& Q) \& (R \& S) : R$

2. $P \rightarrow (P \& Q), P : Q$

3. $(P \rightarrow R) \& P : R$

4. $Q, P \leftrightarrow Q : P$

5. $R \rightarrow S, T \& (T \rightarrow (S \rightarrow R)) : R \leftrightarrow S$

6. $Q, R : P \rightarrow (Q \& R)$

III.Bonus-Natural deduction: construct a proof from premises to the conclusion of the sequent below by rule of inference you've learned in the class (1pts)

1. $P \rightarrow Q : (P \& R) \rightarrow Q$
2. $(P \& Q) \rightarrow R, P : Q \rightarrow R$

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