

Exercises for “Non-Classical Logics” Exercise sheet 9

Exercise 9.1: (6 P)

Prove that the following formulae are valid using the tableau calculus presented in the lecture.

$$(1) \ \Diamond(P \vee Q) \rightarrow (\Diamond P \vee \Diamond Q)$$

$$(2) \ (\Diamond P \vee \Diamond Q) \rightarrow \Diamond(P \vee Q)$$

$$(3) \ \Diamond(P \wedge Q) \rightarrow (\Diamond P \wedge \Diamond Q)$$

Exercise 9.2: (2 P)

Prove that the formula A is satisfiable using the tableau calculus presented in the lecture.

$$A : \quad \neg((\Diamond P \wedge \Diamond Q) \rightarrow \Diamond(P \wedge Q))$$

and construct a Kripke model $\mathcal{K} = (S, R, I)$ and a state $s \in S$ such that $(\mathcal{K}, s) \models A$ using a saturated tableau for A .

Exercise 9.3: (2 P)

Construct a saturated or closed tableau starting from the following prefixed formula:

$$T(\Box\Diamond P \wedge \Diamond P) \rightarrow \Diamond\Box P$$

Please submit your solution until Wednesday, January 18, 2012. Please do not forget to write your name on your solution.