

LGIC 010 & PHIL 005

Problem Set 1

Spring Term, 2013

1. (33 points) Test the following schemata for validity.

(a)  $(p \oplus q) \supset ((p \equiv r) \oplus (q \equiv r))$  (Recall that " $\oplus$ " represents exclusive disjunction.)

(b)  $((p \supset r) \wedge (q \supset r)) \supset ((p \vee q) \supset r)$

(c)  $(p \supset q) \vee (q \supset p)$

2. (55 points) In each case, determine whether the first schema implies the second.

(a)  $p \equiv q \quad (p \wedge r) \equiv (q \wedge r)$

(b)  $(\neg p \supset \neg q) \quad (p \supset q)$

(c)  $(\neg p \supset \neg q) \quad (q \supset p)$

(d)  $(p \vee q) \wedge r \quad p \vee (q \wedge r)$

(e)  $p \vee (q \wedge r) \quad (p \vee q) \wedge r$

3. (12 points) How many truth assignments to the six sentence letters  $p_1, \dots, p_6$  satisfy the following schema?

$$(p_1 \wedge p_2) \vee (p_3 \wedge p_4) \vee (p_5 \wedge p_6)$$