

LGIC 010 & PHIL 005
Problem Set 1
Spring Term, 2009

1. (24 points) Test the following schemata for validity.
 - (a) $(p \supset q) \vee (q \supset p)$
 - (b) $(p \oplus q) \equiv (\neg p \oplus \neg q)$ (Recall that “ \oplus ” represents exclusive disjunction.)
2. (65 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) $(\neg p \supset \neg q) \quad (q \supset p)$
 - (c) $(\neg p \supset \neg q) \quad (p \supset q)$
 - (d) $(p \wedge q) \vee r \quad p \wedge (q \vee r)$
 - (e) $p \wedge (q \vee r) \quad (p \wedge q) \vee r$
3. (11 points) Write down a schema X with the following properties:
 - (a) each of the sentence letters “ p ,” “ q ,” “ r ,” “ s ,” and “ t ” occurs exactly once in X ; and
 - (b) a truth assignment satisfies X if and only if it assigns an odd number of these sentence letters the value \top .

You may use any of the connectives that appear in this problem set to construct X .