CSE 4/563 Knowledge Representation
Professor Shapiro
Homework 1
Maximum Points: 17
Due: 11:00 AM, Wednesday, January 28, 2009

Name: _____

January 21, 2008

Print this document, print your name on the line above, and write the answers as indicated. Write neatly! Illegible answers will be considered incorrect.

This homework is due at the beginning of lecture on the date given above.

1. Indicate, by putting an "X" in the proper blank, whether the following expressions are syntactically correct according to the syntax of Propositional Logic given in lecture.

   (a) (1) Is_____ Is Not_____ $(P \Rightarrow \neg Q) \vee (\neg Q \Rightarrow P)$

   (b) (1) Is_____ Is Not_____ $(P \wedge Q \wedge R) \Rightarrow Q$

   (c) (1) Is_____ Is Not_____ $((P \wedge Q) \wedge R) \Leftrightarrow [P \wedge (Q \wedge R])$

   (d) (1) Is_____ Is Not_____ $Tom\ drives\ Betty \Rightarrow Tom\ is\ the\ driver$

   (e) (1) Is_____ Is Not_____ $Tom\ drives\ Betty\neg \Rightarrow Betty\ is\ the\ driver$

2. Using the following atomic propositions, with the given intensional semantics:

   - $[Io\ is\ a\ moon\ of\ Jupiter]$ = Io is a moon of Jupiter.
   - $[Io\ is\ large]$ = Io is large.
   - $[Io\ is\ cold]$ = Io is cold.
   - $[Io\ is\ far\ from\ the\ Sun]$ = Io is far from the Sun.

   Formalize the following sentences as well-formed propositions of Propositional Logic.

   (a) (3) If Io is far from the Sun, then Io is cold.

   (b) (3) If Io is cold, Io is not large.

   (c) (3) Io is a large cold moon of Jupiter.

   (d) (3) Io is far from the Sun, but is not cold.