Propositional Logic I

1. Insert quotation marks where required.[1]
    (a) & means the same as and.
    (b) The first word of this sentence is the.
    (c) Socrates is a Greek philosopher.
    (d) Socrates is the name of a Greek philosopher.
    (e) *P* is part of the formula (*P* ∨ ~*Q*).
    (f) *P* stands for the proposition that snow is white.

2. Which of these formulae is a wff?
    (a) *P* ∨ ∨ *Q*
    (b) *P* ~*Q*
    (c) ((*P* & *Q*) ∨ ~*P*) ⊃ ~*Q*
    (d) *R* ∨ (~*P* & *Q*)
    (e) ⊃ *P* (& *Q*
    (f) ~(((*P* & *Q*) ∨ (*R* & *Q*)) ∨ ((*Q* ⊃ ~*R*) & ~*P*))
    (g) ~~*P*

3. Translate into PL. Interpretation: *P* = Jim loves Brenda; *Q* = Brenda loves Jim; *R* = Jim is smart, *S* = Bill loves Brenda.
    (a) Jim does not love Brenda but he is smart.
    (b) Jim is smart and he loves Brenda.
    (c) Either Jim loves Brends or Bill does not.
    (d) Brenda and Jim love each other.
    (e) Neither Jim loves Brenda nor does Bill.
    (f) Either Jim is not smart or both he and Bill love Brenda.
    (g) Either Brenda or Jim love each other or it is not the case that Jim loves Brenda or Brenda loves Jim.

4. Translate into PL. Interpretation: *P* = Socrates is wise; *Q* = Plato is wise; *R* = Hume is wise.
    (a) Not both Socrates or Hume are wise.
    (b) Plato is wise but Hume is not.
    (c) Either Plato and Hume are wise or Socrates is.
    (d) It is not the case that Plato is and Socrates is not wise.

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1   After Smith, P. (2003). *Introduction to Formal Logic.* Cambridge: CUP (pp. 87, 60)

OUDCE Hilary Term 2013 Peter Wyss