PHIL 112 Homework 1

Hardy Jones
999397426
Dr. Landry
Winter 2014

1. Define
   (a) Quantificational truth
   (b) Quantificational equivalence
2. Symbolize the following sentences, using the symbolization key given. UD: Everything Ixy: x is identitcal to y Mx: x is a math problem Lx: x is a logic problem Sxy: x is easier to solve than is y
   (a) Math problems are easier to solve than logic problems.
   (b) Some logic problems are easier to solve than are others.
3. Determine the truth values of the following with the given interpretation. UD: Set of people and planets Hx: x is a human being Lxy: x lives on y Px: x is a planet Sx: x is in the solar system e: earth
   (a) $(\exists x)(\forall y)[Hx \wedge (Py \supset Lxy)]$
   (b) $(Pe \wedge Se) \wedge (\exists w)(Hw \wedge Lwe)$
   (c) $(\exists x)(Hx \wedge Lxe) \equiv Se$
   (d) $(\forall x)(\forall y)[(Hx \wedge Py) \supset \neg x \equiv y]$
4. Determine the truth values for the following with the given interpretation. UD: Set of people Mx: x is a male Sx: x is a scientist Oxy: x is older than y a: Albert Einstein
   (a) $(\forall x)(Mx \wedge Sx) \supset \neg Sa$
   (b) $(\forall x)[(Mx \wedge Sx) \supset \neg Sa]$
   (c) $(\forall x)(\forall y)(Oxy \supset \neg Oyx)$
   (d) $(\forall y)[\neg y \equiv [a \wedge (My \wedge Sy)]]$
5. Construct an expansion of each of the following sentences for the set of constants $\{a, s\}$
   (a) $(\forall x)(\exists y)Sxy \wedge D$
   (b) $(\exists x)Fx \equiv \neg(\forall y)Gsy$

6. Show that the following argument is not quantificationally valid. Use both the interpretation method and the truth-functional expansion method.

$$\begin{array}{l} (\forall y)(\exists x)(Py \supset Cyx) \\ (\exists x)Cxx \\ \hline (\exists x)\neg Cxx \end{array}$$

7. Are the sentences $(\forall y)Fy$ and $\neg(\exists y)\neg Fy$ quantificationally equivalent?