Name ___________________________________

Final Examination
Philosophy 112
Winter 2005

Please work all the problems in the space provided. You may use only the techniques noted on the individual problems. Please be sure that you do everything that is asked for in each problem. Also, in each answer, bring out as much detail as possible.

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1. Transcribe the following argument, revealing as much structure as possible and providing a transcription guide, with a domain that includes everything. (15 points)

The sum of one and one is two.
If a positive integer is odd, then the sum of it and one is even.
One is odd.

Two is even.

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2. Using the formal semantics for Predicate Logic (**not a derivation**), show whether the following argument is valid or invalid. (15 points)

$(\exists x)(Mx \,\&\, Px)$
$(\forall x)(Ix \supset Mx)$
―――――――――――
$(\exists x)(Ix \,\&\, Px)$

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3. Using the formal semantics, show that the following two sentences of Predicate Logic are logically equivalent. (15 points)

$(\forall x)Cx$
$\sim(\exists x)\sim Cx$

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4. Show that the following sentence is neither logically true nor a contradiction by constructing an interpretation on which it is true and one on which it is false. State why it is true in the interpretation in which it is true, and why it is false in the interpretation on which it is false. (15 points)

$(\exists x)(Fx \,\&\, (\forall y)(Fy \supset x = y)) \,\&\, (\forall x)(Fx \supset Gx)$

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5. Determine the truth-value of the following sentence in the interpretation given. Show in detail how the truth-value is determined. (10 points)

$(\forall z)(Ez \equiv ((\exists y)Gzy \; \& \; (\exists x)Gxz))$

Domain: {1, 2, 3}
Ex: x is even
Gxy: x is greater than y

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6. Prove that the following collection of sentences is inconsistent by providing a derivation. Quantifier Negation rules may be used. (15 points)

$(\forall x)Fx \vee (\forall x){\sim}Fx, \quad (\exists x)Fx \equiv (\exists x){\sim}Fx$

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7. Prove that the following sentence is a contradiction by providing a derivation, **without using the Quantifier Negation rules**. (15 points)

$[(\forall x)Fx \supset (\exists y)Gy] \,\&\, [\sim(\exists x)Gx \,\&\, \sim(\exists x)\sim Fx]$