Name _____

Midterm
Philosophy 134
Spring, 2005

1. 1. Show, using the derivation rules for B, that the following derivability relation holds in B:

$\{\Diamond\Box\mathrm{P}\}\vdash_B\mathrm{P}[3.5\mathrm{in}]$

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2. Explain the difference between a frame and an interpretation. Why do we define semantical entailment, equivalence, and validity relative to a frame?

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3. Show that the following derivability relation holds in KD by giving a derivation (you may **not** use Duality or derived rules of SD):

$\{\Box\Diamond P, \Box\Box Q\} \vdash_{KD} \Box\Diamond(P \equiv Q).$

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4. Show that the following derivability relation holds in KD by giving a derivation (you **may** use Duality and derived rules of SD):

$$\{\Box(A \lor B)\} \vdash_{KD} \Box A \lor \Diamond B.$$

5. Show that the following entailment holds in KI:

$\{\Box D \supset \Diamond E\} \vDash_{KI} \Diamond(D \supset E).$

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6. Show that the following entailment fails in the semantical system KI:

$\{\Diamond(P \supset \Diamond Q)\} \nvDash_{KI} \Diamond(P \supset Q).$