

FIRST M.A. EXAMINATION

Philosophy (PY1003)

Resit September 2005 – Time allowed: 2 hours

INTRODUCTION TO LOGIC

Answer **ALL** questions.

**This examination constitutes 100% of your assessment for this module. You are free to repeat material from any previous attempts at continuous assessment or examination, but do not repeat material between questions.**

1. Determine whether or not the following sequents are valid. Use truth trees to justify your reasoning. If a sequent is invalid, explicitly exhibit a counterexample. (6 points)
  - (a)  $\neg (A \vee B) \vdash A \rightarrow \neg B$
  - (b)  $(A \rightarrow B) \rightarrow C, \neg C \vdash \neg A$
  - (c)  $(A \vee B) \vee (A \leftrightarrow C), \neg C \vdash \neg B$
  
2. Formalise into predicate logic the following sets of sentences./

2. Formalise into predicate logic the following sets of sentences. Clearly exhibit your translation key. (3 points)
- (a) {All salmon are fish. No fish have wings. Some salmon have wings}
  - (b) {All salmon are fish. Some fish have wings. No salmon have wings.}
  - (c) {Every cat loves every salmon. Sally is a salmon. Some cats love Sally}
3. Determine whether or not each set in question 2 above is consistent. Use truth trees to justify your reasoning. If a set is consistent, explicitly exhibit a model. (7 points)
4. Determine whether or not the following sequents are valid. Use truth trees to justify your reasoning. If an argument is invalid, explicitly exhibit a counterexample. (4 points)
- (a)  $\exists x (Fx \vee Gx), \forall x (Hx \wedge Gx) \vdash \exists x (Fx \wedge Hx)$
  - (b)  $\forall x (Fx \leftrightarrow Gx), Ga, a=b \vdash Fb$
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