

PHILOSOPHY TRIPOS Part IB

Friday 20 May 2016

09.00 – 12.00

Paper 2

LOGIC

*Answer **three** questions only.*

Write the number of the question at the beginning of each answer. If you are answering the either/or question, indicate the letter as well.

STATIONERY REQUIREMENTS

20 Page Answer Book x 1

Rough Work Pad

**You may not start to read the questions
printed on the subsequent pages of this
question paper until instructed that you
may do so by the Invigilator**

1. What does the compositionality of meaning explain?
2. EITHER (a) What does the liar paradox show us about truth?
OR (b) 'The expression "...is true" is a meaningful predicate. So truth must be a property.' Discuss.
3. 'It is absurd, but to some people it is also easy, to be misled by the grammatical similarity of "Somebody came" to "Nobody came" into the misconception that "Nobody" refers to a person just as does "Somebody"'. Discuss.
4. Is an invalid argument invalid in virtue of its form?
5. Is Frege's notion of the sense of a singular term coherent?
6. 'Sin 90° = 1. Cos 90° = 0. Tan x = sin x/cos x. So tan 90° = 1/0.' Formalize this argument, discussing any problems that arise.
7. Answer both parts of this question.
 - (i) A relation R is weakly dense if $\forall x\forall y(xRy \rightarrow \exists z(xRz \wedge zRy))$. Show that the formula $\Box\Box p \rightarrow \Box p$ is a logical truth of the modal logic of weakly dense Kripke models, but $\Box p \rightarrow \Box\Box p$ is not.
 - (ii) Show that the formula $\Box p \rightarrow \Box\Box p$ is a logical truth of the modal logic of transitive Kripke models, but $\Box\Box p \rightarrow \Box p$ is not.
8. Are the meanings of the logical constants given by their inference rules?
9. 'If the arbitrarily given axioms do not contradict one another with all their consequences, then they are true and the things defined by the axioms exist.' (HILBERT) Discuss.
10. Answer both parts of this question.
 - (i) Outline a proof of the Disjunctive Normal Form Theorem via truth tables.
 - (ii) Outline a proof of the Conjunctive Normal Form Theorem via substitution.

END OF PAPER