

General Instructions: Answer *either* two questions from Part I and one from Part II, *or* one question from Part I and two from Part II. If you answer two questions from Part I, you may choose only one question from each sub-part.

Part I

Sub-Part A

1. State, *sketch a proof of*, and explain the logical and philosophical significance of the existence of an enumerable, but not recursively enumerable, set of sentences.
2. State, *sketch a proof of*, and explain the logical and philosophical significance of Gödel's first incompleteness theorem.
3. State, *sketch a proof of*, and explain the logical and philosophical significance of the fundamental theorem for canonical models in propositional modal logic.

Sub-Part B

4. State, *sketch a proof of*, and explain the logical and philosophical significance of the aleph-null-non-categoricity of first order arithmetic.
5. State, *sketch a proof of*, and explain the logical and philosophical significance of the compactness theorem for first order logic.
6. State, *sketch a proof of*, and explain the logical and philosophical significance of the (downward) Löwenheim-Skolem theorem.

Part II

1. Some logicians and philosophers distinguish between expressions which are "logical constants" and those which are not. Why and how is this distinction to be drawn?
2. It has been claimed that the bounds of logic co-incide with those of one or another meta-theoretic property –compactness, or the existence of a positive test for validity, for example. What hangs on this? What can be said for and against such views?
3. What, if anything, do plurals and plural quantification teach us about the logic of ordinary English?
4. Quine has claimed that it is *impossible* for a variable within an opaque context to be bound by a quantifier outside of the context. Exactly what arguments can be given for this thesis? What merit is there in Quine's thesis?
5. Must validity be defined in terms of truth?