FIL1006 - Introduction to logic
Exam Spring 2017
26 May 4 hours

No aids permitted

The exam consists of nine assignments with a top score of 100 points. Provide answers to as many assignments as you manage. Remember that partly correct answers also are rewarded with points.

Assignment 1 (14 points)

"Paraphrase is a suitable tool for clarifying what a sentence in natural language says." Discuss what is right and what is wrong about this claim.
(This a question for discussion. A good answer should be a short essay. But take care not to spend too much time on this problem.)

Assignment 2 (16 points)

This assignment asks for some definitions and short explanations. It suffices to write two to three sentences about each of the notions to be defined.

(a) What is it for two schemas to be *equivalent*?

(b) What is it for a relation to be *transitive*?

(c) What is it for an argument to be *valid*?

(d) Explain briefly the distinction between *use and mention*.

Assignment 3 (8 points)

By using truth-tables, show that :

(a) "$(p \equiv q) \supset -p \vee -q$" is a satisfiable truth-functional schema

(b) "$-(p.q.r) \supset -p \vee (-q \vee -r)$" is a vaild truth-functional schema

Assignment 4 (12 points)

Paraphrase the following statements using truth-functional logic:

(a) If Holmes does not solve the puzzle, Watson is in danger of being hurt or captured.

(b) Kari will join for a walk only if the weather is nice and Nils also joins.

(c) Neither Per nor Pål won half of the kingdom, but Askeladden did, and he won the princess as well.

Assignment 5 (10 points)

Paraphrase the following argument and show by using truth-functional deduction that it is valid.

Premise 1	Logic is easy.
Premise 2	If logic is easy, then the exam is easy and boring.
Premise 3	I will pass the exam if it is easy or I am clever.
Conclusion	I will pass the exam.

Assignment 6 (10 points)

Use truth-functional deduction to show that:

(a) "$(p.q).r \supset s$" implies "$p \supset (q \supset (r \supset s))$".

(b) "$p \equiv q$" and "$-q$" implies "$-(p \vee q)$"

Assignment 7 (8 points)

Paraphrase the following statements using predicate logic. (If necessary, use Russell's analysis of definite descriptions.)

(a) No linguist respects someone who makes spelling mistakes if they do not use dictionary.

(b) The Opera's Artistic Director receives much publicity.

Assignment 8 (8 points)

Provide an abstract interpretation with a non-empty extension of the predicate "F" that makes the following schemata true:

(a) $\forall x \exists y(Fxy \supset Fxx \vee Fyx)$

(b) $\exists x \exists y(Fxx.x \neq y. - Fyx)$

Assignment 9 (14 points)

Paraphrase the following two arguments. For each argument, if it is valid, show this by using natural deduction, and, if it is invalid, show this by using a counterexample. (The difference between the arguments is marked with italics.)

	Premise 1	Some composers admire *some* philosophers
(a)	Premise 2	Some philosophers admire all logicians
	Conclusion	All logicians are admired by someone who is admired by someone

	Premise 1	Some composers admire *all* philosophers
(b)	Premise 2	Some philosophers admire all logicians
	Conclusion	All logicians are admired by someone who is admired by someone