FIL1006 - Introduction to logic
Spring 2016
Thursday 2 June at 09:00 (4 hours)

No aids permitted

The exam assignment consists of 2 pages in total

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)
'A vaild argument is a good argument'. Discuss what is right or wrong about this claim.
(This a question for discussion. A good answer should be a short essay. But be careful to not 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 a schema to be *unsatisfiable*?

(b) What is the definition of one or more statements *implying* another?

(c) Provide a brief explanation of the distinction between *numerical identity* and *qualitative identity*.

(d) What is it for a statement to be a *truth-function*? Illustrate by using one or two examples.

Assignment 3 (8 points)
Show, by using truth-tables, that the followng schematas are valid:

(a) $(-p \supset q) \supset p \vee q$

(b) $(p \supset -(q \vee r)) \equiv (-p \vee -q. - r)$

Assignment 4 (12 points)
Formalize the following statements using truth-functional logic:

(a) Petter gets angry if Linn screams or makes a mess.

(b) The reporter does not pose difficult questions unless the person interviewed smiles or laughs.

(c) Either Askeladden gets the princess and half of the kingdom, or neither Per nor Pål receives any award.

Assignment 5 (10 points)

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

Premise 1	The bird expects offspring if it builds a nest or occupies a nesting box
Premise 2	The bird collects twigs or builds a nest
Premise 3	The bird does not collect twigs
Conclusion	The bird expects offspring

Assignment 6 (10 points)

Use truth-functional logic to show that:

(a) $p \vee -p$ is valid.

(b) $(p.q) \supset (r \supset s)$ implies $(p \supset q) \supset ((p.r) \supset s)$.

Assignment 7 (8 points)

Formalize the following statements using predicate logic. (You may have to use Russell's analysis of definite descriptions.)

(a) No author respects any journalists who respect themselves.

(b) The king of Norway is both down to earth and popular.

Assignment 8 (8 points)

Show, by using natural deduction, that (a) implies (b). Show, by using a counterexample, that (b) does not imply (a).

(a) $\exists x(Fx.Gx)$

(b) $\exists xFx.\exists Gx$

Assignment 9 (14 points)

Formalize 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.

	Premise 1	Some philosophers have read every book
(a)	Premise 2	Some books are read by all enthusiasts
	Conclusion	Some philosophers are enthusiasts

	Premise 1	Some philosophers have read every book
(b)	Premise 2	Some books are read only by enthusiasts
	Conclusion	Some philosophers are enthusiasts