Semantiek – end exam (2nd chance) – 3.6.10 Student number: _____

Yoad Winter

Instructions:

1. Please fill in your answers on the exam sheets (3 pages).
2. Exam duration: 2 hours
3. You are not allowed to use any pre-prepared material.
4. Please do not forget to write down your student number on the top of the exam sheet.

Good luck!

Question 1 (10+10+5+10+10=45 points)

Consider the following lexicon.

word	category	denotation
all	$(s/(np\backslash s))/n$	$\lambda A_{et}.\lambda B_{et}.\forall x_e[A(x) \rightarrow B(x)]$
three	$(s/(np\backslash s))/n$	$\lambda A_{et}.\lambda B_{et}.\lvert A \cap B\rvert = 3$
birds	n	$\mathbf{bird}'_{et}$
mammals	n	$\mathbf{mammal}'_{et}$
blue	n/n	$\lambda A_{et}.\lambda x_e.A(x) \wedge \mathbf{blue}'_{et}(x)$
high	$(np\backslash s)\backslash(np\backslash s)$	$\lambda A_{et}.\lambda x_e.A(x) \wedge \mathbf{high}'_{et}(x)$
fly	$np\backslash s$	$\mathbf{fly}'_{et}$

Consider the following sentences:

(1.1) More birds than mammals fly.

(1.2) Less mammals than birds fly.

(i) Add lexicon entries (categories and lambda expressions of the appropriate types) for the words *more*, *less* and *than* in order to treat sentences like (1.1) and (1.2).
Complete the following:

more:

Category: _____ Type: _____

Lambda expression: _____

less:

Category: _____ Type: _____

Lambda expression: _____

than:

Category: _____ Type: _____

Lambda expression: _____

(ii) Write down a full derivation (category + lambda terms for all constituents) of sentence (1.1) according to your proposal in (i).

(iii) Simplify the lambda expression you got for sentence (1.1) as much as possible:

_____

(iv) Repeat **(ii)** for yourself on sentence (1.2). Write down here only the resulting lambda term, and the simplifications steps in its normalization. Verify that what you get is equal to what you got in **(iii)**.

(v) For each of the arguments of the word *more* in your proposal, write down the monotonicity of the function you suggested for *more* in the relevant argument. Illustrate monotonicity using a valid entailment, and lack of monotonicity by describing a situation that shows it. Complete the following.

On its **1st** argument, *more* is: upward monotone/downward monotone/non-monotone

Illustration: _____

On its **2nd** argument, *more* is: upward monotone/downward monotone/non-monotone

Illustration: _____

On its **3rd** argument, *more* is: upward monotone/downward monotone/non-monotone

Illustration: _____

(vi) Consider the following version of the Ladusaw-Fauconnier Generalization from lecture 4:

> *Negative polarity items (NPIs) occur within arguments of downward monotone functions but not within arguments of functions that are not downward monotone.*

Based on your answers to (iv) and this version of the Ladusaw-Fauconnier generalization, write down for each argument of *more* a sentence with an NPI that you expect to be acceptable/unacceptable. Complete the following.

Sentence for **1st** argument of *less*:

_____

Expectation: acceptable/unacceptable (mark the right answer)
Sentence for **2nd** argument of *less*:

_____

Expectation: acceptable/unacceptable (mark the right answer)

Sentence for **3rd** argument of *less*:

_____

Expectation: acceptable/unacceptable (mark the right answer)

(vii) Write down the lambda term for the meaning of *more or less* in the following sentence:
(1.3) More or less birds than mammals fly.

_____

(viii) Write down the most simplified lambda term for (1.3) that is derived by the lambda term you wrote in **(vii)**.

_____

(ix) Consider the following sentence.

(1.4) [Not [more or less birds than mammals]] fly

In a given model, assume that the entity domain is {b1,b2}, and that the birds are {b1,b2,b3} and that the mammals are {m1,m2}.
What would be the denotation of the subject in (1.4) given this model, given your answer to **(vii)**? In your answer please use sets rather than characteristic functions.

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