Semantic Theory 2025: Practice Exam

Due* by Monday, May 29 11:59 am

You have 120 minutes to do this exam. The exam consists of 9 questions, of which the sub-questions (labeled: a, b, ...) are worth 10 points each (140 points total). In order to pass, you must get at least 70 points.

Please number every sheet of paper that you submit, and note the total number of sheets on the first page. You may not use any additional materials beyond those distributed together with this exam. Please do not use pencils.

Question 1: Predicate Logic (10)

a. Translate the following sentences into first-order predicate logic:

   i. *Every student doesn't read a book*

   ii. *John and Bill love every city they visit*

Question 2: Type Theory (10)

a. Provide the derivations (type inferencing) of each of the following sentences. Brackets indicate the combinatorics, and subscripts indicate the types of (some of) the expressions—the rest must be deduced. You can treat "the food" as the single term f' in (i).

   i. [*Some* $cat_{\langle e,t\rangle}$] [$ate_{\langle e,\langle e,t\rangle\rangle}$ $\underline{\textit{the food}}_{e}$]

   ii. [*Mary hates a book*] $and_{\langle t,\langle t,t\rangle\rangle}$ [*Steve hates a movie*]

Question 3: λ-Calculus (10)

a. Given the types that you determined (or were given) for the terms in (2a), derive the corresponding λ-expressions for the following terms:

   i. *some*

   ii. *cat*

   iii. *eat*

   iv. *and*

   v. *a*

Question 4: Generalized Quantifiers (20)

Consider the following sentence: *Only George can solve the problem*

a. Give the generalized quantifier definition of the noun phrase *"only George"*.

b. What are the monotonicity properties (left and right) of *only*? Show how you derived these properties.

Question 5: Event Semantics (20)

a. Translate the following sentences into Davidsonian (event semantics) representations, **including** temporal information. Underlined expressions may be treated as a single term with the specified type.

   i. *Mary cut every page with* $\underline{\textit{scissors}}_e$ *on Friday*

   ii. *Susan arrived before Harold* $\underline{\textit{fell asleep}}_{\langle e,\langle e,t\rangle\rangle}$

b. For each sentence in (a), draw a Davidsonian model structure in which the sentence holds. You may ignore the temporal aspects of the sentences here.

Question 6: Lexical Semantics (20)

Consider the following sentence: $S =$ *"three fans met the actor"*

a. How many readings does the sentence S have? List all possible readings in natural language. Treat "the actor" as the named entity a'.

b. Translate each reading of S to the extended first-order logic for plural terms, where variables $\mathrm{X}, \mathrm{Y}, \mathrm{Z}, \ldots$ range over proper sums, $\mathrm{X} \oplus \mathrm{Y}$ denotes the group consisting of X and Y, $\lhd$ denotes the part-of-relation, and $N(\mathrm{X}) = |\{y \mid At(y) \wedge y \lhd \mathrm{X}\}|$ takes a proper sum X and returns the number of atoms in X.

Question 7: Dynamic Semantics (10)

Translate the following natural language utterances into Dynamic Predicate Logic. You may treat underlined expressions as named entities (e.g. *"*$\underline{\textit{cookies}}$*"* $\Rightarrow c'$), *"bring"* as the three-place predicate *bring*(x, y, z) in (i), and *"will be fined"* as the one-place predicate *fined*(x) in (ii).

i. *Sarah brings* $\underline{\textit{cookies}}$ *to* $\underline{\textit{work}}$*. Everyone likes her.*

ii. *If a driver breaks* $\underline{\textit{the law}}$*, they will be fined. Nobody breaks* $\underline{\textit{the law}}$*.*

Question 8: DRT (20)

a. Give DRS representations for the following sentences:

   i. *Every boy likes Mary or Sally*

   ii. *Bill and Yvonne don't eat salad*

b. Give the truth-conditions for one of the DRSs in (a) (you pick). Use verifying embeddings to arrive at the model-theoretic interpretation.

Question 9: Presuppositions (20)

a. Give proto-DRSs for the following sentences:

   i. *"If John is married, his son loves his wife or he doesn't have a son"*

   ii. *"Every bald hockey player wants Bill's hair"*

b. Resolve the proto-DRSs in (a). Explicitly describe the resolution constraints you apply.