

1995 Paper 7 Question 14

Additional Topics

Discuss briefly the way in which a formal definition can assist the design and implementation of a programming language. [7 marks]

Explain the notion of a *delivery judgement* in Natural Semantics. Explain the ingredients of the judgement form

$$E \vdash_v \text{exp} \Rightarrow R$$

which represents the evaluation of an expression in Standard ML. Describe the rules which allow one to infer a judgement

$$E \vdash_v \text{exp atexp} \Rightarrow v$$

representing the application of a function to a value. [7 marks]

State the theorem which asserts the soundness of the Standard ML type discipline, explaining the notation used. How does this theorem help to reduce the number of evaluation rules which are necessary? [6 marks]