Comparative Programming Languages

(a) Briefly discuss the compromises that must be made when standardising a programming language. [8 marks]

(b) Discuss the relative merits to (1) the application programmers and (2) compiler writer of the following ways of specifying a programming language.

(i) A concise readable user manual for the language in English containing many useful programming examples.

(ii) A very long and highly detailed description, in English, of every feature of the language. This manual contains no programming examples.

(iii) A concise but rigorous description using a formal grammar to describe the language syntax and making extensive use of mathematical notations taken from set theory, λ-calculus, predicate calculus and logic to describe the semantics of the language.

(iv) The source code for a clean and elegant machine-independent interpretive implementation of the language. [12 marks]