COMPUTER SCIENCE TRIPOS Part IA – 2005 – Paper 1

1 Foundations of Computer Science (LCP)

This question has been translated from Standard ML to OCaml

It is required to implement polynomials, which may contain any number of different variables, with the operations of *addition* and *equality test*.

- Computing that the sum of $xy^2 + 2xz - y$ and $y + 4xw - xz$ is $xz + xy^2 + 4xw$ is an example of polynomial addition.

- Determining that $xy + z^2$ equals $zz + yx$ is an example of an equality test.

(*a*) Design a suitable representation of polynomials, in OCaml. Justify the choices you make. [6 marks]

(*b*) Describe how you would implement addition and the equality test, and express their efficiency using O-notation. It is not necessary to present OCaml code. [4 marks]