

1993 Paper 4 Question 1

Further Modula-3

Describe the facilities in Modula-3 for defining generic interfaces and modules.

[5 marks]

Illustrate your answer by sketching a generic interface and implementation for a **Bag**, that is, a collection of items of the same type (possibly including duplicates), implemented as an opaque object with **insert** and **remove** methods. [10 marks]

The default **Bag** should be implemented as a stack, using a last-in first-out policy. Describe briefly alternative implementations providing specialisations of **Bag** to give a **Queue** (first-in first-out) and **Set** (ignoring duplicates). [5 marks]