1993 Paper 6 Question 10

Computation Theory

Explain what is meant by the following:

> 'F is a recursively enumerable set each of whose elements is a total recursive function $f : \mathbb{N} \to \mathbb{N}$.' [3 marks]

In each of the following cases state with reasons whether the set is recursively enumerable:

(a) the set A of all total recursive functions $a : \mathbb{N} \to \mathbb{N}$ such that $a(n+1) \geqslant a(n)$ for all $n \in \mathbb{N}$ [7 marks]

(b) the set D of all total recursive functions $d : \mathbb{N} \to \mathbb{N}$ such that $d(n+1) \leqslant d(n)$ for all $n \in \mathbb{N}$ [10 marks]