

INFORMATICA INSTITUUT, FACULTEIT WISKUNDE EN INFORMATICA, UU.
IN ELEKTRONISCHE VORM BESCHIKBAAR GEMAAKT DOOR DE $\mathcal{I}\mathcal{B}\mathcal{C}$ VAN A-Eskwadraat.
HET COLLEGE INFOFP WERD IN 2004-2005 GEGEVEN DOOR PROF. DR. S.D. SWIERSTRA.

Functioneel Programmeren (INFOFP) 24 februari 2005

The exam consists of two open questions (2 points each) and 6 multiple choice questions (1 point each). A wrong multiple choice answer will give a negative result ($-\frac{1}{3}$ point), whereas omitting the answer results in 0 points. Therefore, guessing is not recommended. Hand in this form, with choices made and open questions answered. Put the right answer to the multiple choice questions in the box to the right of the alternatives.

Opgave 1

Define the function `takeWhile` using a call to `foldr`.

Opgave 2

Give the type and the definition of the function `foldl`.

Opgave 3

What is the type of the expression `[[]]`?

- a) `[a]`
- b) `[[]]`
- c) `[Int]`
- d) `[a]`

Opgave 4

What is the result of `foldr const 0 [1,2,3]` in which `const x y = x`?

- a) 0
- b) 1
- c) 3
- d) 6

Opgave 5

What is the result of `(filter even.takeWhile even) [[]]`?

- a) `[]`
- b) `[2]`
- c) `[[]]`
- d) a type error message

Opgave 6

What is the result of `foldr ((+).(+1)) 0 [1,2,3]`?

- a) 1
- b) 6
- c) 7
- d) 9

Opgave 7

Which text completes `until p f x = ...?`

- a) `takeWhile p (iterate f x)`
- b) `takeWhile (not.p) (iterate f x)`
- c) `(head.dropWhile (not.p)) (iterate f x)`
- d) `dropWhile p (iterate f x)`

Opgave 8

What is the type of of the function `dmap f l = map (map f) l`?

- a) `(a → b) → [[a]] → [[b]]`
- b) `(a → b) → [[a]] → [b]`
- c) `(a → b) → (a → b) → [a] → [b]`
- d) `(a → c → b) → [a] → [c] → [b]`