Quiz 5

Graded

Student

Abhinav Shripad

Total Points

10 / 10 pts

Question 1

Q1 **10** / 10 pts

Implementation of add and add_5

✔ **+ 4 pts** Correct

1

+ 3 pts Mostly Correct

+ 2 pts Partially Correct

+ 0 pts Incorrect

Implementation of mult

✔ **+ 2 pts** Correct

+ 1 pt Partially Correct

+ 0 pts Incorrect

Implementation of cube

✔ **+ 2 pts** Correct

+ 1 pt Partially Correct

+ 0 pts Incorrect

✔ **+ 2 pts** Implementation of final function

+ 0 pts Totally Incorrect / Not Attempted

Overcomplicated but correct solution.

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COL352: Introduction to Automata & Theory of Computation

Date: 03/09/2025 15 minutes QUIZ Maximum marks: 15

$f(0) = 125$ ... (I)

$f(x+1) = add(f(x), g(x))$ .. (II)

$g(0) = 91$ ... (III)

$g(x+1) = add(g(x), h(x))$ .. (IV)

$h(0) = 36$ .. (V)

$h(x+1) = add(h(x), 6)$ .. (VI)

$add(x, 0) = x$ ... (VII)

$add(x, y+1) = S(add(x, y))$ .. (VIII)

(S: successor)

we have defined f, g, h, add recursively.

clearly from (VII) and (VIII) $add(x, y) = x + y$

from (V) and (VI) $h(x) = 36 + 6x$

$\Rightarrow$ from (IV) and (V), $g(x+1) = g(x) + 6x + 36$

and $g(0) = 91 \Rightarrow g(x) = 3(x+5)^2 + 3(x+5) + 1$

and now from (I) and (II)

$f(x+1) = f(x) + 3(x+5)^2 + 3(x+5) + 1$

and $f(0) = 125 \Rightarrow f(x+1) = (x+6)^3$

$\Rightarrow \boxed{f(x) = (x+5)^3}$