Quiz 7

Deadline	Wednesday, 16 October 2019 at 4:00PM
Latest Submission	Wednesday, 16 October 2019 at 12:57PM
Raw Mark	5.00/5.00 (100.00%)
Late Penalty	N/A
Final Mark	5.00/5.00 (100.00%)

Question 1 (1 mark)

Define the sequence a_0, a_1, ... recursively as follows:

- $a_0 = 1$
- $a_{n+1} = 1/(1+ a_n)$ for $n \geq 0$

What is a_5 (when expressed in lowest terms)? Write your answer as x/y.

8/13

✔ Your response was correct.
Mark: 1.00

Question 2 (1 mark)

Suppose T(n) = 2T(n-2) + n and T(1)=T(0)=1.

Which of the following classes does T(n) belong to?

(a) ○	$\Theta(n \log n)$
(b) ○	$\Theta(n^2)$
(c) ◉	$\Theta((\sqrt{2})^n)$
(d) ○	$\Theta(2^n)$
(e) ○	None of the above

✔ Your response was correct.
Mark: 1.00

Question 3 (1 mark)

Let $\Sigma = \{0,1\}$ and define $f:\Sigma^* \rightarrow \Sigma^*$ recursively as follows:

- f(λ) = 1
- f(0w) = 1w
- f(1w) = 0f(w)

What are f(1101) and f(1111)? Enter your answers separated by a space

0011 00001

✔ Your response was correct.
Mark: 1.00

Question 4 (1 mark)

Order the following functions in **increasing** order of asymptotic complexity. (You may assume all necessary base cases are defined and equal to 1)

- T(n) where T(n) = 2T(n/2) + log(n)
- T(n) where T(n) = 4T(n/4) + 4n
- n√n
- T(n) where T(n)= 8T(n/3) + (8/3)n²
- T(n) where T(n) = T(n-1) + 7n√n

✔ Your response was correct.
Mark: 1.00

Question 5 (1 mark)

Define f,g:$\mathbb{N}\to\mathbb{N}$ as follows:

- f(0) = 1
- g(0) = 3
- f(n+1) = 5f(n) - g(n) for n≥0
- g(n+1) = 6f(n) for n≥0

What is f(5)?

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✔ Your response was correct.
Mark: 1.00