

University of Toronto Faculty of Arts and Science

CSC165H1S Midterm 1, Version 2

Date: February 6, 2019 Duration: 75 minutes Instructor(s): David Liu, François Pitt

No Aids Allowed

	-					· · ·						 	
Name:													
Studen	t Nu	$\mathbf{m}\mathbf{b}$	er										

- This examination has 3 questions. There are a total of 6 pages, DOUBLE-SIDED.
- All statements in predicate logic must have negations applied directly to propositional variables or predicates.
- In your proofs, you may always use definitions we have covered in this course. However, you may **not** use any external facts about these definitions unless they are given in the question.
- For algorithm analysis questions, you can jump immediately from an exact step count to an asymptotic bound without proof (e.g., write "the number of steps is $3n + \lceil \log n \rceil$, which is $\Theta(n)$ ").

Take a deep breath.

This is your chance to show us how much you've learned.

We WANT to give you the credit that you've earned.

A number does not define you.

Good luck!

Question	Grade	Out of
Q1		5
Q2		5
Q3		5
Total		15



test-auto-parse-3-2

CSC165H1S, Winter 2019

Midterm 1, Version 2

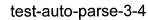
Use this page for rough work. If you want work on this page to be marked, please indicate this clearly at the location of the original question.



 $\mathrm{CSC}165\mathrm{H}1\mathrm{S}$, Winter 2019

Midterm 1, Version 2

1. [5 marks] Question 1.





 ${\rm CSC165H1S}$, Winter 2019

Midterm 1, Version 2

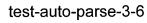
2. [5 marks] Question 2.



CSC165H1S, Winter 2019

Midterm 1, Version 2

3. [5 marks] Question 3.





CSC165H1S, Winter 2019

Midterm 1, Version 2

Use this page for rough work. If you want work on this page to be marked, please indicate this clearly at the location of the original question.