

UNIVERSITY OF TORONTO

Faculty of Arts and Science

DECEMBER 2017 EXAMINATIONS

CSC165H1F

Duration: 3 hours

Instructor(s): Danny Heap

No Aids Allowed

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Name:

Student Number:

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Please read the following guidelines carefully!

- This examination has 8 questions. There are a total of 16 pages, **DOUBLE-SIDED**.
- Answer questions clearly and completely. Provide justification unless explicitly asked not to.
- All formulas must have negations applied directly to propositional variables or predicates.
- In your proofs, you may always use definitions of predicates from the course. You may *not* use any external facts about rates of growth, divisibility, primes, or greatest common divisor unless you prove them, or they are given to you in the question.
- For algorithm analysis questions, you can jump immediately from a step count to an asymptotic bound without proof (e.g., write “the number of steps is  $3n + \log n$ , which is  $\Theta(n)$ ”).
- You must earn a grade of at least 40% on this exam to pass this course.

Take a deep breath.  
This is your chance to show us  
How much you’ve learned.  
It’s been a real pleasure teaching you this term.  
Good luck!

Question	Grade	Out of
Q1		3
Q2		9
Q3		7
Q4		11
Q5		10
Q6		6
Q7		6
Q8		12
<b>Total</b>		<b>64</b>