

YOUR NAME/ID/SEAT: ((Personalized name/ID/seat will be here))

You must copy and sign this (you are allowed to copy and sign this before the exam): “I affirm that I will not give or receive any unauthorized help on this exam, and that all work will be my own.” _____

Signature _____

Midterm 1

2023/3/1

CSC 280/480: Computer Models and Limitations, Prof. Lane Hemaspaandra, Spring 2023

Instructions: *We will grade only the work you put on these stapled test sheets (you may solve a problem only on the front and back of the sheet it is on, since we will separate the sheets during grading). The blank white paper we will make available is for you to use as scrap paper and will be neither collected nor graded.* (Note: You should ignore the “ ” boxes, which are found only on this page and the page headers.)

There are six 20-point questions on Part 1 and we will grade all six but will for each student **drop the lowest of the six**. So it is a 100-point exam. However, we will give each student as extra credit their score from Part 2, *plus also as extra credit one quarter of the score they got on the dropped Part-1 question*. So it is possible to score a 110/100 (110%) on the exam. (Note: Not all students may have the same ordering of the problems or of the answers, and, for example, your test paper’s first problem might not be the easiest one.)

For the purposes of this exam, you may, if you wish, treat the transition function $\delta(q, b)$, $q \in Q$ and $b \in \Sigma$, of a DFA as if it will even take strings as its second argument, and as if it will in that case, say $\delta(q, w)$, $q \in Q$ and $w \in \Sigma^*$, output the state that one ends up in if, from state q , one goes through the sequence of transitions dictated by the characters in w . (This paragraph is not making a claim either way about whether some problem(s) on the exam will need you to do that.)

This is an in-class midterm exam being given during the March 1 class period. Closed book. Closed notes (except for at most one 8.5-by-11 2-sided—or two 8.5-by-11 1-sided—*handwritten* self-prepared notes sheets). Write clearly. Closed computer/phones/electronics/etc. (no electronics may even be in sight or reach). **You may not leave the room during the exam** without irretrievably handing the exam in before leaving.

No questions may be asked during the exam. (If you are convinced that something is severely wrong in a way that makes the problem impossible to solve, explain, on your test sheet, what is severely wrong. But for example minor typos where it is clear enough what was intended do not mean you can skip solving a problem.)

	Problem	Score
<input type="checkbox"/> <input type="checkbox"/>	(Part 1) 1	
<input type="checkbox"/> <input type="checkbox"/>	(Part 1) 2	
<input type="checkbox"/> <input type="checkbox"/>	(Part 1) 3	
<input type="checkbox"/> <input type="checkbox"/>	(Part 1) 4	
<input type="checkbox"/> <input type="checkbox"/>	(Part 1) 5	
<input type="checkbox"/> <input type="checkbox"/>	(Part 1) 6	
<input type="checkbox"/> <input type="checkbox"/>	Part 1 Total (= sum of the five highest of 1/2/3/4/5/6)	
<input type="checkbox"/> <input type="checkbox"/>	Extra Credit: 1/4 of your score on the dropped question from Part 1	
<input type="checkbox"/> <input type="checkbox"/>	Extra Credit: Part 2	
<input type="checkbox"/> <input type="checkbox"/>	Total (i.e., Your Exam Score)	/100