Midterm

Wednesday, 31 March 2021
10:30–11:20 AM

There are 5 [illegible] 6 points for a total of 30 points.

As an im[illegible] today?s test, please turn your camera?s on. This would [illegible]? protocol with those of the other classes at UM. While situations differ, every student is responsible for insuring the integrity of the test, and must take all reasonable steps in support of insuring the integrity.

No notes, no collaboration.

Please sign the cover page so show agreement with these directions.

Name: _____

Problem	Credit
1	
2	
3	
4	
5	
Total	

1. Give a DFA that accepts exactly the strings over the alphabet $\{0, 1\}$ that contain 00101.

2. Give a Context Free Grammar for the language over the alphabet $\{a, b\}$ of the form $a^i b^j a^j b^i$ where $i, j \geq 0$.

3. (a) Check (✓) the box if the operation (Union, Concatentation, etc.) is [illegible] language class (Regular or CFL).

	Reg. Lang.	CFL's
[illegible]nation		
[illegible]		
Intersection		
Complement		

(b) Are all Regular Languages also Context Free Languages?

Yes	No

(c) Is the intersection of a CFL with a Regular language necessarily (check all that apply)

Regular	CFL	neither

4. Give a Regular Expression for the language over $\{a, b\}^*$ for strings that contain an even number of a's and an odd number of b's.

5. Prove that the language

$a^+b^ic^i \cup b^*c^*$

for $i \geq$

First s ng lemma *fails* to show this language is non-regular straight forward manner.

Then take a step to distill the non-regularity and apply the pumping language to the derived problem.