Midterm1 CPSC 323 Section __

Name: _____

10/2020 (Tue-Thu) 100 points (20% of semester grade)

ANSWER ALL 5 QUESTIONS (20 points each)
SHOW YOUR WORK AND ADD MORE PAGES AS NEEDED

1. a) Name the five steps of the compilation process with I/O of each step (5)?
b) What is the goal or purpose of the Lexical Analyzer (5)?
c) What is the formal definition of a DFSM, name all the components (5)?
d) What is the difference between a DFSM and a NFSM (5)?

2. For the following NFA state transition table function:

	a	b	ε
0	{ }	{2}	{1}
1	{0,4}	{ }	{ }
2	{ }	{4}	{ }
3	{4}	{ }	{ }
4	{ }	{ }	{3}

q0=0 and F={4}

Define the e-closures (5) and convert it into a DFA table using the **subset method** (15 points)

3. Use Thompson's construction method to convert the following RE= a* (a | b) **into a NFA diagram (20)**

4. Convert the following Regular Expression into an NFA diagram (10) and into a DFSM table (10). For Sigma={l,d,o} , you can use 'l' for letters, 'd' for digits and 'o' as other inputs for any other symbols. Label the starting state and final state.

RE = l (l | d)*o

5. Based on the book, write the code for a DFSM() function that can iterates through a state transition table[1..nstates, 1..nInputs] and determine if an input string(w) is accepted or not.

Given that w is a string(1D-array of chars as a parameter) and table is a 2D-array(of numerical values and has already been pre-defined). And the function char_to_col() can convert any character to an integer value. You can also use any of the pre-existing functions getNextToken(), currentToken(), getNextChar(), currentChar(), backup(), error() or match() if needed or not.

Using pseudo-code to implement the function (maximum of 15 points)
Using syntactically and grammatically correct c/c++ or python (maximum 20 points)