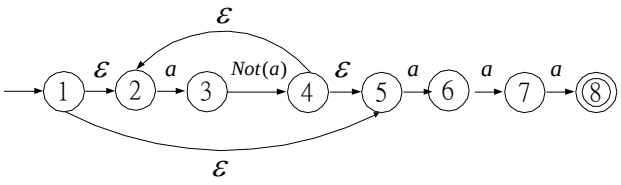
Midterm 2015 (Compiler) Name: _____ Grade:_____

1. (10%) List 7 steps of a compiler process. Which of them are machine independent ? Which of them are machine dependent ?

2. (10%) For the following NFA, find the corresponding DFA with the minimal number of states.



3. (10%) Reduce the following transition table to the minimal number of states.

		Input		
	δ	a	b	c
	1	2	5	
	2	3	4	1
	3	5	2	
States	4	3	2	1
	5	1	4	1
	6	1		1
	7	3	6	3

4.(10%). Is the following grammar LL(1) ? Explain why ?

S → Ab

A → a

A → B

A → ε

B → b

B → ε

5. (20%) Lab.

請用“簡短的”敘述回答以下問題（寫出重點即可，不需寫得太複雜).

(a) 你如何處理註解能跨行？

(b) 經由 lex 所產生的 C 檔案內，呼叫那個函數會去切 token（即辨識 token)？

（c）你如何處理規格書中沒有定義的字元(例如 #)?

（d）你在 Lex Program 的 regular expression 中，如何忽略空白字元?

（e）以檔名 hello.l 為例, 請寫出利用 flex 編譯此程式語法，並寫出會產生哪些檔案

6. (10%) Suppose that a grammar has the following productions:

S-->aBc

B-->bXb

B-->bX

X-->a

X-->ab

(a) Is the string "ababc" in the language generated by the grammar ?

(b) Is the grammar ambiguous ? Justify your answer.

7.(30%) For the following grammar:

<E> ::= <T> <E'>

<E'> ::= + <T> <E'> |ε

<T> ::= <F> <T'>

<T'> ::= * <F><T'> |ε

<F> ::= (<E>) | id

(a) Find First and Follow sets (for each nonterminal symbol). (10%)

(b) Create its parsing table. (10%)

(c) Shows the move made by predictive parser on input id+ id * id (based on a stack). (10%)