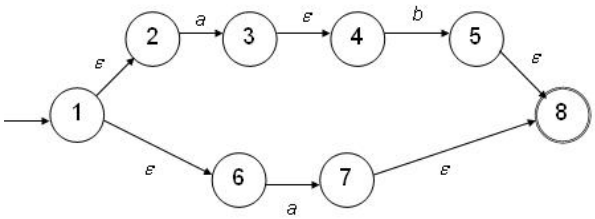
Midterm 2013 (Compiler) Name: _____ Grade:_____

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 minimum number of states.



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3. (10%) Reduce the following transition table.

		Input symbols				
	δ	+	—	·	d	ε
	S	A	A			A
	A				B, C	E
	B				B	F
	C			D	C	
	D				D	F
States	E			G	E	
	(F)					
	G				H	
	H				H	F

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”敍述回答以下問題（寫出重點即可，不需寫得太複雜).

(1) 在 Lex 中你如何定義代表加減乘除(+-*/)的 token，請寫出其 Regular Expression?

(2) 在 lex 中,被 regular expression 辨認出來的 token 會存放到哪個變數中？

(3) 在 lex file 的 rules part 中，如果定義了表示 reserved word 以及 identifier 的 token 的話，你要怎麼避免 scanner 不會將 reserved word 判斷成 identifier?

(4) 你如何處理規格書中沒有定義的字元(例如 #)？

(5) 你如何判斷一個字串超過 30 個字？

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%)