Final (Compiler) Name: _____ Grade:_____

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

S → Ab

A → a

A → B

A → ε

B → b

B → ε

2. (10%) Rewrite the following left recursive grammar into non-recursive EBNF grammar.

S → Aa | b

A → Ac | Sd | ε

3.(10%) Use one example to show that the following grammar is ambiguous.

stat → **if** cond **then** stat
| if cond **then** stat **else** stat
| other-stat

4.(10%) Is the following grammar SLR(1) ?

S → Id:=A A →Id:=A

A → E E →E+P

E →P P →Id

P → (A)

5. (10%) Based on the Post-fix form of a parsing tree, transfer the following expression into the intermediate code (quadruples, 四項式).

R = (a * b + c) - (a * (b + c))

6. (10%) For the following grammar rules, write the related semantic rules. For example, for the rule, type--> float, the related semantic rule is type.dtype = real.

decl--> type var-list

type-->int

type-->float

$var\text{-}list_1$-->id, $var\text{-}list_2$

var-list-->id

7. (10%) Given the declaration B: array[0..3, 1..6] of integer, show the corresponding quadruples (四項式), for the statement B[I, J] := 5. Assuming that data is stored in the row-major and an integer is represented in 3 bytes.

8.(10%) For the Precedence table for the following grammar, write down the parsing steps for the input $ID+(ID+ID)$.

S→E

E→F

F→F+T

F→T

T→ ID

T→(E)

	E	F	T	ID	+	(	)	$
E							≒	≒
F					≒		o>	o>
T					o>		o>	o>
ID					o>		o>	o>
+			≒	<o		<o		
(	≒	<o	<o	<o		<o		
)					o>		o>	o>
$	≒	<o	<o	<o		<o		

Step	Parse Stack	Remaining Input
1		$ID+(ID+ID)$

9. (20%) Lab.

(a) 在你的 yacc 檔案中，必須呼叫哪一個 function，yacc 才會去執行判斷文法的動作？

(b) 如果你有一個叫 NUMBER 的 token，在你的 yacc 檔中，要如何告訴 yacc 你有這個 token？

(c) 在編譯 yacc 檔案時，必須加上什麼指令，才會產生定義 token 代碼的檔案？

(d) 承 (c)，這個定義 token 代碼的檔案叫什麼名字？

(e) 假設有一條 “A→B+C” 的文法，在你的 yacc 檔案中要如何定義它？