

Final (Compiler) Name: _____ Grade: _____

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

$S \rightarrow Ab$

$A \rightarrow a$

$A \rightarrow B$

$A \rightarrow \epsilon$

$B \rightarrow b$

$B \rightarrow \epsilon$

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

$S \rightarrow Aa \mid b$

$A \rightarrow Ac \mid Sd \mid \epsilon$

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

stat \rightarrow **if cond then stat**
 | **if cond then stat else stat**
 | other-stat

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

$S \rightarrow Id:=A$ $A \rightarrow Id:=A$

$A \rightarrow E$ $E \rightarrow E+P$

$E \rightarrow P$ $P \rightarrow Id$

$P \rightarrow (A)$

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-list₁-->id, var-list₂

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)\$.

$S \rightarrow \$E\$$

$E \rightarrow F$

$F \rightarrow F + T$

$F \rightarrow T$

$T \rightarrow ID$

$T \rightarrow (E)$

	E	F	T	ID	+	()	\$
E							\leqq	\leqq
F					\leqq		>0	>0
T					>0		>0	>0
ID					>0		>0	>0
+			\leqq	<0		<0		
(\leqq	<0	<0	<0		<0		
)					>0		>0	>0
\$	\leqq	<0	<0	<0		<0		

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？