Southeast University Examination Paper (MidTerm Self-test)

Course Name Principles of Compiling Examination Term 15-16-2 Score

Related Major Examination Form Close test Test Duration 120 Mins

Please obey the rules of examination. If you violate the rules, your answer sheets will be invalid

Surname

Student No.

There are 5 problems in this paper. You can write the answers in English or Chinese.

1. Please construct **context-free grammars without ε-productions** for the following language.

L={ω| ω∈(a,b,c,d)* and the numbers of a's and b's and c's occurred in ω are **even**, and ω **starts with a or b** }

2. Please construct a **DFA with minimum states** for the following regular expression. (15%)

   a(a(a|b)*b)*(a|b)*(a|b)b

3. Please **eliminate the left recursions (if there are)** and **extract maximum common left factors (if there are)** from the following context free grammar, and then decide **the resulted grammar** is whether a LL(1) grammar by **constructing the related LL(1) parsing table.**(15%)

   S→begin L end|if E then S|if E then S else S|while E do S|a

   L→L;S|S

E→E or F|F

F→F and G|G

G→(E)|b

4. Please **construct a LR(1) parsing table for the following ambiguous grammar with your own defined additional conditions (You determine the required additional conditions by yourself)**.(15%)

S→if E then S| if E then S else S|a

E→ E and E|E or E|(E)|b

5. Please construct **an annotated parse tree** for the input string 4*5+6 where the syntax-directed definition is as following (10%):

Productions	Semantic Rules
$E \rightarrow E_1 * T$	$E.val = E_1.val * T.val$
$E \rightarrow T$	E.val=T.val
$T \rightarrow T_1 + F$	$T.val = T_1.val + F.val$
$T \rightarrow F$	T.val=F.val
$F \rightarrow i$	F.val=i.**lexval**