

Southeast University Term Examination Paper

Course Name Principles of Compiling Examination Term _____ Score _____
Related Major _____ Examination Form Close test Test Duration 120 Mins

There are 4 problems in this paper. You can write the answers in English or Chinese on the attached paper sheets.

1. Please construct context-free grammars **with ϵ -free productions** for the following language (10%).

$\{\omega \mid \omega \in (a,b,c,d)^* \text{ and the numbers of } a\text{'s and } b\text{'s and } c\text{'s occurred in } \omega \text{ are odd, and } \omega \text{ starts with } a, \text{ ends with } c \text{ or } d\}$

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

$((a|b)^*(a|b)(a|b)^*)^*(ab)^*(a|b)$

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%)

$S \rightarrow \text{if } E \text{ then } S \mid \text{if } E \text{ then } S \text{ else } S \mid a$

$E \rightarrow E \text{ and } F \mid F$

$F \rightarrow F \text{ or } G | G$

$G \rightarrow (E) | b$

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%)

$S \rightarrow SaS | SbS | cSd | eS | f$