Faculteit der Exacte Wetenschappen	Tentamen Compilerbouw
Vrije Universiteit	24-01-2001

Questions can be answered in Dutch or English.

1. Explain the following terms:

a. transition table

b. weight of a subtree

c. jump table

d. heap

2. Lexical analysis:

a. What is the dot motion rule for a lexical item of the form

$[\, T \rightarrow \alpha \cdot (\, R \,)^* \, \beta \,]$

b. Explain this rule.

3. Parsing: Construct the $LR\,(0)$ automaton for the grammar

$$S \rightarrow x\, S\, x \mid a$$

where x and a are terminal symbols.

4. Context handling; last-def analysis collects information by symbolic interpretation.

a. What information is collected by last-def analysis?

b. How is the information collected by the symbolic interpretation process?

c. Why does last-def analysis require full symbolic interpretation rather than simple symbolic interpretation?

5. Code generation, peephole optimization:

a. What is a replacement pattern?

b. How are replacement patterns usually obtained?

c. How are the left-hand sides of replacement patterns found efficiently in the input stream?

6. Memory management: Sketch two methods by which the positions of pointers in chunks can be communicated to the garbage collector.

7. Imperative programs: What components are usually found in an activation record (stack frame) and what purposes do they serve?

8. In the Prolog rule

grandparent (X, Z) :– parent (X, Y), parent (Y, Z).

the goal *parent (X, Y)* may match more than one *Y*. How are these multiple values transferred to the second goal *parent (Y, Z)* ?

Assessment:

	1:	2:	3:	4:	5:	6:	7:	8:	
a:	4	5	10	2	2	8	10	8	
b:	4	7		7	6				
c:	4			4	5				
d:	4								
	16	12	10	13	13	8	10	8	Total : 90