Faculteit Wiskunde en Informatica	Tentamen Compilerbouw
Vrije Universiteit	17-04-1998

Questions can be answered in Dutch or English.

1. Explain the following terms briefly:

a. symbol table

b. jump table

c. dispatch table

d. basic block

2. A lexical analyser is constructed to recognise two patterns a and a*b. It is given the input aaa$ in which $ signals the end of the input.

The lexical analyser will have to read to the end of the input to see that the input does not match the pattern a*b. How can it still yield the first a of the input as the first recognised token?

3. Describe briefly the fundamental difference between *LL* parsing and *LR* parsing.

4. **a.** What is the FIRST set of a non-terminal?

b. What is the FIRST set of a terminal?

5. **a.** What is meant by an 'evaluation cycle in an attribute grammar'? Give a simple example.

b. What is the difference between static and dynamic cycle detection in attribute grammars?

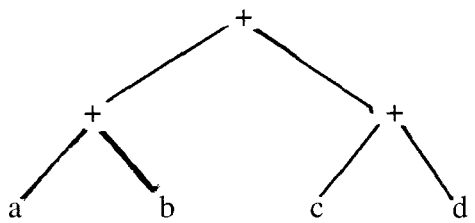
Z.O.Z.

6. Given a machine with only two instructions:

$R_n := R_n + R_m$

$R_n :=$ variable

How many registers are needed for the translation of the tree (without restructuring the tree)



in which a, b, c, d are variables?
Show the calculations for obtaining the result.

7. Explain briefly how 2-space copying garbage collection works.

8. In C, why is it that assignment (=) is defined for structs and equality (= =) is not? (Hint: this is a compiler construction question.)

9. **a.** In a lazy functional language, what is a strict argument to a function?
b. What is strictness analysis?
c. Sketch briefly how it is performed.

10. Linda is based on an associative memory model - Tuple Space.
How can a Linda implementation avoid searching the entire Tuple Space for in and read operations?

Assessment:

1a :	2 :	3 :	4a :	5a :	6 :	7 :	8 :	9a :	10 :
b : 3			b : 1	b : 9				b : 3	
c : 3								c : 6	
d : 3									8
12	8	7	4	14	8	12	5	12	8