

1995 Paper 10 Question 4

Compiler Construction

Construct the characteristic finite state machine for the following grammar.

$$\begin{aligned} S &\rightarrow A B \text{ eof} \\ A &\rightarrow A B \mid B a \\ B &\rightarrow (A) \mid b \end{aligned} \quad [6 \text{ marks}]$$

Explain what is meant by the FOLLOW set for a non-terminal symbol in a grammar, and derive the FOLLOW sets for A and B in the above grammar.

[4 marks]

Construct, with explanation, the SLR(1) *action* and *goto* matrices for the above grammar.

[5 marks]

Illustrate how the SLR(1) parsing algorithm works for this grammar by showing the successive states of the parser stack and input stream while parsing

$$b a b (b a) \text{ eof} \quad [5 \text{ marks}]$$