

5 Formal Models of Language (pjb48)

The Earley parser is an example of a top-down LR chart parser. This question requires you to design a *bottom-up RL chart parser* for parsing sentences with a context-free grammar.

- (a) Describe the structure of the chart. [4 marks]
- (b) Explain how the chart is initialised. [2 marks]
- (c) Describe the parsing algorithm using rule induction notation to describe new edges that can be added to the chart. [6 marks]
- (d) Describe the properties of the chart when a parse is found. [2 marks]
- (e) Explain how to reconstruct a parse tree from the chart. [2 marks]
- (f) Explain how the algorithm could choose between parses if more than one is found. [2 marks]
- (g) Does your approach result in a compact chart? If not, how could you reduce the number of edges in a chart without losing information about the possible parses? [2 marks]