1994 Paper 4 Question 3

Formal Languages and Automata

Explain what is meant by a *context-free* language. [5 marks]

Show that the union of two context-free languages (over the same alphabet Σ) is again context-free. [5 marks]

Consider the language L over the alphabet $\{a, b, c\}$ consisting of all strings of the form $a^\ell b^m c^n$, where $\ell, m, n > 0$ and either $\ell = m$ or $m = n$. Is L context-free? Is it a regular language? Justify your answers, stating carefully any well-known results that you use. [10 marks]