Foundations of Functional Programming

(a) What does the combinator expression \( S \ S \ S \ S \ S \ S \) reduce to? Explain your working carefully. [4 marks]

(b) What would you get if you had a sequence of \( n \) \( S \) combinators (part (a) is the case \( n = 6 \))? [5 marks]

(c) If you start with a sequence of \( K \) combinators of general length \( n \), as in the expression \((K \ K \ K \ K \ K \ K)\) that arises when \( n = 6 \), what will the expression reduce to? [3 marks]

(d) Now what about sequences that start \( S \ K \ S \ K \ S \ K \) in cases where \( n \) instances of \( S \) alternate as shown with \( n \) of \( K \)? You should certainly include in your answer a tabulation of results for some small values of \( n \). [8 marks]