Data Structures and Algorithms

(a) Describe how the Lempel Ziv text compression algorithm works, illustrating your answer by deriving the sequence of numbers and corresponding bit patterns it would generate when applied to a string starting with the following 24 characters:

ABCDABCDABCDABCDABCDABCD ... 

You may assume that the initial table is of size 256 (containing bytes 0 to 255) and that the codes for “A”, “B”, “C” and “D” are 65, 66, 67 and 68, respectively. [12 marks]

(b) Estimate how many bits the algorithm would use to encode a string consisting of 1000 repetitions of the character “A”. [8 marks]