1996 Paper 4 Question 5

Data Structures and Algorithms

Show why comparison-based sorting of n items cannot take much less than $n \log n$ comparisons, being clear about your assumptions. Why can it take *any* less than $n \log n$? [10 marks]

If 1024 numbers are drawn randomly in the range 0–127 and sorted by binary insertion, about how many compares would you expect? A fairly rough estimate will do if your reasoning is clear. [10 marks]