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 \( n \log n \)? \[10 \text{ marks}\]

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. \[10 \text{ marks}\]