

2007 Paper 1 Question 4

Algorithms

For *each* of the following, indicate whether the statement is true or false, and explain why this is the case (you do not need to derive the correct asymptotic complexity yourself, but no marks will be awarded for an answer with no explanation).

- (a) Heapsort executes in worst-case $O(n^2)$ time. [2 marks]
- (b) Insertion sort executes in worst-case $\Theta(n^2)$ time. [2 marks]
- (c) Shellsort executes in worst-case $\Omega(n^{1.5})$ time. [2 marks]
- (d) All sorting algorithms are $\Omega(n \log n)$. [2 marks]
- (e) A linked list is faster to access than a splay tree. [2 marks]