1994 Paper 10 Question 8

Data Structures and Algorithms

Compare and contrast three implementations for a priority queue in terms of an explanation of: what the data structures represent; a sketch of the principal routines; and $O(f(n))$ timings when it is implemented as

(a) an (unsorted) array [5 marks]

(b) a sorted array [5 marks]

(c) a heap [10 marks]

You should consider the routines *insert*, *extract* and *test-for-emptiness* for a priority queue holding n elements. Consider also a routine to initialise a priority queue to hold a given set of n elements.