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.