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1. For a minHeap implementation, assume we use the 0th index of the array to store the root (instead of index 1). Given an element at position i, what would be the position of its parent (assume $i \neq 0$)?

A. [Correct Answer] [Your Answer] $\lfloor \frac{i-1}{2} \rfloor$
B. $\lfloor \frac{i}{2} \rfloor$
C. $\lceil \frac{i-1}{2} \rceil$
D. $\frac{i-1}{2}$
E. None of other options

2. Consider a max heap, represented by the array: 40, 30, 20, 10, 15, 16, 17, 8, 4. Now consider that a value 52 is inserted into this heap. After insertion, the new heap is

A. 40, 30, 20, 10, 52, 16, 17, 8, 4, 15
B. [Correct Answer] [Your Answer] 52, 40, 20, 10, 30, 16, 17, 8, 4, 15
C. 40, 30, 20, 10, 15, 16, 17, 8, 4, 52
D. 40, 52, 20, 10, 15, 16, 17, 8, 4, 30
E. None of the other options

3. What is the worst case running time of `insert (Object)` on a min heap? In answering this question you should assume the best possible implementation given the constraints, and also assume that every array is sufficiently large to handle all items (unless otherwise stated). The variable n represents the number of items.

A. $O(1)$
B. $O(n)$
C. None of the other options
D. [Correct Answer] [Your Answer] $O(\log n)$
E. $O(n^2)$
F. $O(n \log n)$

4. Complete the statement: In a maxHeap, the nodes on any ________

A. [Correct Answer] [Your Answer] path from root to leaf are non-increasing.
B. path from root to leaf are non-decreasing.
C. None of the other choices is accurate.
D. level from left to right are non-decreasing.
E. level from left to right are non-increasing.

5. Fill in the blanks: For a perfect tree of height h containing $n = 2^{h+1} - 1$ nodes, an efficient implementation of `BuildHeap` will call _______ at most _______ times.

A. [Correct Answer] [Your Answer] `HeapifyDown`, n
B. `HeapifyDown`, h
C. `HeapifyUp`, h
D. `HeapifyUp`, n