



### Question - 1

#### Sorting Algo for almost sorted array

SCORE: 5 points

As a developer of your company, you are asked to implement sorting method for processing business data.  
If the input data are already sorted in **\*\*\*most cases\*\*\***, which one would you choose?

- ☒ Insertion Sort
- ☐ Selection Sort
- ☐ Merge Sort

### Question - 2

#### Sorting Algo performance for small dataset

SCORE: 5 points

Which one of the following performs better when the dataset is small?

- ☐ Merge Sort
- ☒ Quick Sort

### Question - 3

#### MaxPriorityQueue Output

SCORE: 5 points

Suppose that the sequence `P R I O * R * * I * T * Y * * * Q U E * * * U * E` (where a letter means insert and an asterisk means remove the maximum) is applied to an initially empty priority queue. Give the sequence of letters returned by the remove the maximum operations.

- ☐ I O P I R R T Y E Q U U
- ☐ I O P I R T R Y Q E U U
- ☒ R R P O T Y I I U Q E U
- ☐ R R P O Y T I U I Q E U

### Question - 4

#### Binary heap

SCORE: 5 points

Please select which of the following statements are true about a binary heap:



A binary heap is an efficient data structure with which to implement a priority queue.



A binary heap is a type of binary tree which is implemented in an array rather than with pointers.



"Heap order" requires that the two child nodes of a node are ordered: smallest on the left, largest on the right.



A binary heap is a "complete" binary tree, by which we mean that all nodes have either two or zero children.



A binary heap is an implicit data structure.

## Question - 5

### Unordered Array MIN Priority Queue

SCORE: 15 points

**Minimum Priority queues** are characterized by the *remove the minimum* and *insert* operations.

Unordered Array MIN Priority Queue does not maintain the elements in sorted order.

It simply appends the element in the array and searches for the minimum element on each delete call.

Implement insert and delete methods for MinPQ.  
Get all Unittests to pass.