Question - 1

SCORE: **5 points**

Question 1

Given the shuffled array [J, L, E, P, A, C, T, O], what would the array look like after the first partition method call?

- [A, C, E, J, L, O, P, T]
- [A, C, E, J, P, L, T, O]
- [J, C, E, A, P, L, T, O]
- [J, A, C, E, L, O, P, T]

Question - 2

SCORE: **5 points**

Question 2

Which of the following code performs the partition operation in QuickSort?

A.

```
private static int partition(int[] arr, int low, int high)
{
 int left, right, pivot_item = arr[low];
 left = low;
 right = high;
 while(left > right)
 {
  while(arr[left] <= pivot_item)
  {
   left++;
  }
  while(arr[right] > pivot_item)
  {
   right--;
  }
  if(left < right)
  {
   swap(arr, left, right);
  }
 }
 arr[low] = arr[right];
 arr[right] = pivot_item;
 return right;
}
```

B.

```
private static int partition(int[] arr, int low, int high)
{
 int left, right, pivot_item = arr[low];
 left = low;
 right = high;
 while(left <= right)
 {
  while(arr[left] > pivot_item)
  {
   left++;
  }
  while(arr[right] <= pivot_item)
  {
   right--;
```

```
  }
  if(left < right)
  {
   swap(arr, left, right);
  }
 }
 arr[low] = arr[right];
 arr[right] = pivot_item;
 return right;
}
```

C.

```
private static int partition(int[] arr, int low, int high)
{
 int left, right, pivot_item = arr[low];
 left = low;
 right = high;
 while(left > right)
 {
  while(arr[left] > pivot_item)
  {
   left++;
  }
  while(arr[right] <= pivot_item)
  {
   right--;
  }
  if(left < right)
  {
   swap(arr, left, right);
  }
 }
 arr[low] = arr[right];
 arr[right] = pivot_item;
 return right;
}
```

D.

```
private static int partition(int[] arr, int low, int high)
{
 int left, right, pivot_item = arr[low];
 left = low;
 right = high;
 while(left <= right)
 {
  while(arr[left] <= pivot_item)
  {
   left++;
  }
  while(arr[right] > pivot_item)
  {
   right--;
  }
  if(left < right)
  {
   swap(arr, left, right);
  }
 }
 arr[low] = arr[right];
 arr[right] = pivot_item;
 return right;
}
```

- ○ A
- ○ B
- ○ C
- ● D

Question - 3
Question 3

SCORE: **5 points**

Which scenario will lead to the worst-case performance of quicksort?

- A. The array is sorted.
- B. The array is reverse sorted.
- C. All values in the array are the same.
- A, B and C.
- Only A and B
- Only B and C.
- Only A and C.

Question - 4
Question 4

SCORE: **5 points**

Which sorting methods perform better with partially-sorted arrays? Check all for which it is true.

- selection sort
- insertion sort
- mergesort
- quicksort

Question - 5
Question 5

SCORE: **30 points**

Implement merge sort.