5. A sorting algorithm is said to be stable if two objects with equal keys appear in the same order in the sorted output. as they appear in the unsorted input.

Whereas a sorting algorithm is said to be unstable if there are two or more objects with equal keys which don't appear in same order before and after sorting.

$$\begin{array}{ccccccccccc} & 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ \text{Input} = [& 35 & 33 & 42 & 10 & 14 & 19 & 26a & 44 & 26b & 31 &] \end{array}$$

$$\Rightarrow [\ 10 \quad 14 \quad 19 \quad 26a \ 26b \quad 31 \quad 33 \quad 35 \quad 42 \quad 44\ ]$$

Above is an example of stable sorting here 26 appears twice at position 6 and 8 and their order is pressed in unsorted and sorted array. i.e. element 26 at position 6 appears first in unsorted and sorted array (before and after sorting). In the case of unstable sort. this order of appearance before and after sorting is not necessarily preserved.