National University of Computer and Emerging Sciences, Lahore Campus

Course:	Design and Analysis of Algorithms	Course Code:	
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Section:	BSE-6C	Page(s):	02
Exam:	Quiz 3 Version 2	Roll. No.	22L-7092
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Instruction/Notes: Honesty always gives fruit and Dishonesty is always harmful.

1. Which sorting algorithm is best suited for sorting large numbers with a fixed digit length?
   a) Count Sort
   b) Quick Sort
   c) Radix Sort
   d) Bucket Sort

2. Which sorting algorithm is NOT stable by default?
   a) Bucket Sort
   b) Quick Sort
   c) Counting Sort
   d) Radix Sort

3. What is the worst-case time complexity of Quick Sort?
   a) O(nlogn)
   b) O(n^2)
   c) O(n)
   d) O(logn)

4. Bucket Sort is most effective when:
   a) The input values are uniformly distributed
   b) The input values are already sorted
   c) The input contains duplicate elements
   d) The input is in reverse order

5. Which sorting algorithm is typically preferred when memory usage is a major constraint?
   a) Bucket Sort
   b) Quick Sort
   c) Counting Sort
   d) Radix Sort

6. If Heap Sort takes 1 second for an input of size 100,000, how long will it take for an input of size 1,000,000?
   a) 2 seconds
   b) 10 seconds
   c) 20 seconds
   d) 50 seconds

7. In a comparison sort, how many comparisons are needed in the worst case to sort 10,000 elements?
   a) O(10^4)
   b) O(10^4log10^4)
   c) O(10^8)
   d) O(log10^4)

8. Radix Sort sorts numbers using Counting Sort as a subroutine. If we have 1 million numbers, each with 5 digits, how many times will Counting Sort run?
   a) 1
   b) 5
   c) 10
   d) 10

9. If a dataset contains 50,000 numbers in the range 1 to 500,000, which sorting algorithm will perform best?
   a) Quick Sort

b) Bucket Sort
c) Counting Sort
d) Radix Sort

10. Given an array of 1 million integers where each number is between 1 and 10,000, what is the best sorting approach?
a) Quick Sort
b) Bucket sort
● Counting Sort
d) Radix Sort

11. An array contains 18 elements with values ranging from 100 to 125. How many slots are required in the auxiliary count array for Counting Sort?

●. 18
b). 25
c). 26
d). 27

12. After applying Counting Sort to the array 4,2,2,8,3,3,14, 2, 2, 8, 3, 3, 14,2,2,8,3,3,1, what will be the last two elements of the sorted array?

wrong Question

a. 8,48, 48,4
b. 3,83, 83,8
● 4,84, 84,8
d. 8,38, 38,3

13. for i in range(1, k+1):

C[i] = C[i-1] + C[i]

What is missing in this loop that could cause incorrect sorting?

a. Initialization of C[i] before this loop
● Incrementing C[i] instead of summing
c. Loop should run from 0 to k instead of 1 to k
d. Using C[i−1] instead of C[i+1]