School of Computing Science and Engineering
Department of Computer Application
Mid Term Examination

Exam Date: 27 Sep 2023
Time : 90 Minutes
Marks : 50

Sem III - MCAN2330 - Design and Analysis of Algorithm
Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1) What is complexity of an algorithm? Explain the three popular asymptotic notations used in expressing the running time of an algorithm — K2 (2)

2) What are Binomial Heaps? How many Binomial Trees are there in a Binomial Heap with 19 nodes? What are they? — K1 (3)

3) Describe how Greedy Algorithms are designed, taking a suitable example. — K2 (4)

4) Explain the working of Merge Sort on the following set of keys 12, 3, 34, 78, 14, 5, 9, 106, 33, 78, 11,23, 8, 44, 55, 6 — K2 (6)

5) Execute Radix sort on the following set of numbers 9415, 8436, 7619, 4002, 9672, 5943, 1267, 4375, 6951, 4328, 8917, 2879, 3276, 6219, 4375 — K3 (6)

6) Write an algorithm for counting sort. Execute your algorithm on the following set of data and show the status of all the three arrays used. — K3 (9)

   2, 5, 6, 2, 7, 4, 3, 6, 9, 1, 8, 2, 5, 7, 9, 3, 2, 6

7) Here are sixteen integer numbers: — K4 (8)
22, 36, 6, 79, 26, 45, 75, 13, 31, 62, 27, 76, 33, 16, 63, 47.
Make a Max-heap and a Min-heap out of these numbers. Do re-heaping of the heaps when the root node is deleted in both the cases.

8) Define B.Tree. Construct a B.Tree of minimum degree 3 with the alphabets of English as its key values. Assume that a<b<c…. and so on. — K4 (12)

OR

Write down the algorithm for Quick Sort. Execute your algorithm on the following list of numbers till 3 elements are placed in their proper positions. — K4 (12)
{ 10, 2, 1, 5, 3, 8, 11, 24, 7 }