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Total No. of Printed Pages: 1

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M. Tech CSE (Semester – 1st)
ADVANCED DATA STRUCTURES
Subject Code: MCSES1102
Paper ID: [23190202]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It carries 16 marks. It consists of 4 questions of 4 marks each.
2. Section B consist of 4 questions of 8 marks each. The student has to attempt any 3 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(4 marks each)

- Q1. Explain abstract data type.
- Q2. Explain in detail splay tree with an example and diagram.
- Q3. What are the different types of string operations, explain in detail.
- Q4. What are the recent trends on hashing techniques?

Section – B

(8 marks each)

- Q5. Explain rehashing and extendible hashing techniques in detail with an example.
- Q6. Write an algorithm for Huffman coding and the complexity of Huffman coding
- Q7. Given the Post-order and In-Order traversals, construct the Binary tree. Write the steps clearly for construction.
Post-Order: 18 26 34 42 30 15 10
In-Order: 18 10 30 15 42 26 34.
- Q8. Differentiate between one dimensional range searching and two dimensional range searching.

Section – C

(10 marks each)

- Q9. List the operations, rotations, and applications of an AVL tree. Explain step-by-step construction of the AVL tree for the given sequence 21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7.
- Q10. Suppose a data file has the following characters and the frequencies. If huffman coding is used, calculate: Huffman Code of each character, average code length, length of Huffman encoded data

Symbol	Frequencies
A	12
B	15
C	7
D	13
E	9

- Q11. The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function $h(k) = k \bmod 10$ and quadratic probing. What is the resultant hash table