

Roll No.....

Total No. of Printed Pages: 1

Total No. of Questions: [11]

**M. Tech CSE (Semester – 1<sup>st</sup>)**  
**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 dictionary data type.
- Q2. Explain deterministic skip lists with an example.
- Q3. Explain the boyer-moore algorithm in detail.
- Q4. What are the various computational geometry methods used for efficiently solving the new evolving problem? Describe these methods.

**Section – B**

**(8 marks each)**

- Q5. Explain different types of collision resolution techniques used in hashing with an example.
- Q6. The characters a to h have the set of frequencies based on the first 8 Fibonacci numbers as follows:  
a : 1, b : 1, c : 2, d : 3, e : 5, f : 8, g : 13, h : 21  
A Huffman code is used to represent the characters. What is the sequence of characters corresponding to the following code? 110111100111010
- Q7. Construct a Binary Search Tree (BST) for the following sequence of numbers-  
50, 70, 60, 20, 90, 10, 40, 100.
- Q8. Differentiate between one dimensional range searching and two dimensional range searching.

**Section – C**

**(10 marks each)**

- Q9. 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. Explain construction of a priority search tree and searching an element in a priority search tree in detail with an example and a diagram.
- 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 linear probing. What is the resultant hash table?