

Code No.: CS8102PC

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**CMR ENGINEERING COLLEGE: : HYDERABAD**  
**UGC AUTONOMOUS**  
**I-M.TECH-I-Semester End Examinations (Regular) – April - 2022**  
**ADVANCED DATA STRUCTURES USING PYTHON (PC- II)**  
**(CSE)**

[Time: 3 Hours]

[Max. Marks: 70]

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART-A**

(20 Marks)

1. a) What is the difference between big-oh notation and little-oh notation? [2M]
- b) Define collision in hashing. [2M]
- c) What is the necessity to moving towards skip list? [2M]
- d) Define node Structure of skip list. [2M]
- e) Define double rotation in AVL Trees. [2M]
- f) Explain the advantages of B-trees. [2M]
- g) List the properties of standard tries. [2M]
- h) Differentiate compressed tries and suffix tries. [2M]
- i) List advantages of Priority Range Trees. [2M]
- j) Define Quad trees? [2M]

**PART-B**

(50 Marks)

2. Explain linked list collision resolution techniques. [10M]
- OR**
3. Given input (371, 323, 173, 199, 344, 679, 989) and has function  $h(x) = x \text{ mod } 10$ , show the result using: (i) Separate chaining. (ii) Closed hashing using linear probing, quadratic probing, and double hashing  $h_2(x) = 7 - (x \text{ mod } 7)$ . [10M]
4. Explain various operations that can be performed on skip list. [10M]
- OR**
5. Explain the necessity of randomizing data structures and algorithms. [10M]
6. Discuss about height balanced trees and their operations with an example. [10M]
- OR**
7. a) Describe the B-trees? Explain the advantages of B-trees. [5M]
- b) Prove that let T be a Red Black Tree with n interval nodes then no node has depth greater than  $2 \log(n+1)$ . [5M]
8. a) Explain the construction of the KMP flow chart with an example. [5M]
- b) Explain the search engines. [5M]
- OR**
9. Write an algorithm for Brute Force pattern matching and analyze its time complexity with suitable example? [10M]
10. Explain the one dimensional Range search with an example? [10M]
- OR**
11. Write the various computational geometry methods for efficiently solving the new evolving problem? [10M]

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