

**TILAK MAHARASHTRA VIDYAPEETH, PUNE**  
**MASTER OF COMPUTER APPLICATIONS**  
**(Specialization in Cloud Technology)**  
**EXAMINATION :MAY - 2024**  
**SEMESTER - I**  
**Sub: Advanced Data Structures (MCCL23-103)**

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**Date : 24/05/2024**

**Total Marks : 60**

**Time: 2.00 pm to 4.30 pm**

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**Instruction:**

1. All questions are compulsory unless and otherwise stated.
  2. Bold figures to the right of every question are the maximum marks for that question.
  3. Candidates are advised to attempt questions in order.
  4. Answers written illegibly are likely to be marked zero.
  5. Use of scientific calculators, Log tables, Mollier Charts is allowed.
  6. Draw neat and labelled diagram wherever necessary.
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**Q.1. Answer the following in 2-3lines. (Any 5) (10)**

1. Give an applications of stack.
2. What is deterministic skip list?
3. Construct binary search tree for: 8,10,6,15,4,20,18.
4. What is need of trie data structure?
5. Define hash function.
6. What is quad tree?
7. Define linked list.

**Q. 2. Answer the following in short. (Any 4) (20)**

1. Write a short note on singly linked list.
2. Explain need for randomizing data structure and algorithm.
3. What is binary tree? Define: i) Full binary tree ii) Skewed binary tree  
Consider the following string and pattern,  
String : "Nobody Noticed Him"
4. Pattern : "Not"  
Search the given pattern in the string using Brute-Force Pattern Matching.
5. Write a short note on priority search tree.
6. Describe collision resolution techniques in hashing?

**Q. 3. Answer the following in detail. (Any 3) (30)**

1. What is queue? Enlist types of queue.
1. Write a short note priority queue.
2. Define skip list. How can we update an element in the skip list?
3. What is AVL tree? How to construct AVL tree. Explain rotations used to balance the AVL Tree.
4. Explain the longest common subsequence problem (LCS).
5. What are the geometric problems? What are the solutions to the geometric problems?

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