CB
(Batch 2023-24)

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MASTER OF COMPUTER APPLICATIONS

(Specialization in Artificial Intelligence & Machine Learning) / (Specialization in Data Science)

EXAMINATION :MAY - 2024

SEMESTER - I

Sub: Data Structures & Algorithms (MCAI 23-103/MCDS23-103)

Date :24/05/2024 **Total Marks :60** **Time: 2.00 pm to 4.30 pm**

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.*

Q.1. Answer the following in 2-3lines. (Any 5) **(10)**

1. What is the need for an algorithm?
2. What is searching?
3. What is an array? Enlist operations in the array.
4. Write the time complexities of Insertion sort and Merge sort.
5. Define Strictly binary tree
6. What is unweighted graph?
7. Define the term time complexity.

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

1. What is asymptotic notation? Explain the term big O(O) notation.
2. Write a short note on linear search.
3. Write a short note on singly linked list.
4. Explain the different tree representation methods.
5. Explain the difference between tree and graph.
6. Write a short note on priority queue.

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

1. What is sorting? Describe merge sort in detail.
2. Differentiate between greedy method and dynamic programming.
3. What is stack? Write an algorithm for operations of stack with examples.
4. Write insertion, deletion and searching operations on AVL trees.
5. What is graph? How to represent graph storage using Adjacency matrix.
