

Roll No.

Total No. of Pages : 02

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**B.Tech.(AI&DS/AI&ML/Block Chain/CSE/Cyber Security/DS/
CSD/Internet of Things and Cyber Security including Block Chain
Technology) (Sem.-3)**

DATA STRUCTURE & ALGORITHMS

Subject Code : BTCS301-18

M.Code : 76436

Date of Examination : 18-06-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION - A

1. **Write briefly :**
 - a) Define Asymptotic notations.
 - b) Write about linear search.
 - c) Discuss double Linked List.
 - d) What are postfix expressions?
 - e) List out the basic operations that can be performed on a stack.
 - f) Difference between array and linked list.
 - g) Define binary tree.
 - h) Write a short note on AVL tree.
 - i) Define sets.
 - j) What is Heap?

SECTION - B

2. Discuss some of the common operations that can be performed on data structures by taking suitable example.
3. Define recursion. Which data structure can be used to implement it? Give example.
4. Discuss various operations on queues. What are the advantages of circular queue?
5. Show the algorithm of Selection sort.
6. Illustrate the concept of breadth-first search traversing of graph.

SECTION - C

7. Write an algorithm to implement the insertion and deletion in Link List.
8. How a linear array is represented in memory? Explain the program which reads two matrixes.
9. What do you mean by hashing? Explain any one popular hash function.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.