S.Y.B.Sc(IT) (Sem-III) April-2023

Q.P. Code: 00000682

Data Structures

[Time:2.30 Hrs]	**[Marks:75]**
Please check whether you have got the right question paper.	
N.B:	1. All question are compulsory. 2. Figures to the right indicate full marks. 3. Students answering in the regional language should refer in case of doubt to the main text of the paper in English.

Q.1		Attempt **any three** of the following: a. What is data structure? Explain different categories of data structure. b. What is sparse matrix? Explain different ways of representing sparse matrix into memory. c. What are the limitations and advantages of Arrays? d. Explain the complexity of an algorithm with its types. e. Explain how to insert an element in an array with example. f. Explain memory representation of two dimensional array.	15
Q.2		Attempt **any three** of the following: a. Explain One-Way Linked List with its operation and implementation. b. What are the applications and implementation of Circular Linked List? Give its advantages. c. How to insert new node in existing linked list? Give example. d. How to traverse a two way linked list? Give its algorithm. e. How to copy one Linked List into another Linked List. Give example. f. Give applications of Linked List.	15
Q.3		Attempt **any three** of the following: a. Explain different types of Queue. b. Evaluate: 7, 5, +, 4, *, 8, 11, 9, - , + , - c. What are different ways of implementing Stack? d. Enlist the applications of Queue. e. Explain different applications of Stack. f. What are different ways of representing Queue?	15
Q.4		Attempt **any three** of the following: a. Explain the concept of Insertion sort with example. b. Explain the linear search technique with appropriate example. c. Enlist the operations which can be performed on Binary Tree. d. Explain Max Heap with example. e. Explain the postorder traversal of tree with example.	15

		f. What is Red Black Tree? Explain with an example.	
Q.5		Attempt **any three** of the following: a. Explain the Division-Remainder address calculation method for hashing b. Explain Quadratic Probing collision resolution technique c. Explain the concept of Re-Hashing d. Explain the directed graph and undirected graph with example e. Create an adjacency list of graph with example f. Write steps for Kruskal's Algorithm for Minimum Spanning Tree	15