

[Time:2.30 Hrs]		[ Marks:75 ]
Please check whether you have got the right question paper.		
N.B:	1. All questions 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 <b>any three</b> of the following: a. What is an algorithm? What are the characteristic of an algorithm? b. Define ADT (Abstract Data Type) and mention the features of ADT. c. What is data structure? Differentiate linear and non-linear data structure. d. Write an algorithm to insert an element into the array and to delete an element from the array. e. What do you mean by Array? Describe the storage structure of array. Also explain various types of array in detail. f. Distinguish between primitive and non-primitive data structures?	15
Q.2	Attempt <b>any three</b> of the following: a. What is linked list? Explain its type with suitable diagram. b. What is a circular linked list? How to traverse a circular linked list? c. List out the different ways to implement the list? d. Explain algorithm to delete element from singly linked list. e. Write and explain an algorithm to split a link list into two linked list. f. State the advantage and disadvantage of linked list?	15
Q.3	Attempt <b>any three</b> of the following: a. Define Stack? What are the operations of stack? b. Write an algorithm to implement the stack operations using an array. c. Discuss the use of stack in implementing recursive procedures. d. Define queue. What are the operations of a queue? e. Distinguish between stack and queue. f. Convert following expression $(A+B)*(C+D)/F$ in prefix and postfix notation.	15
Q.4	Attempt <b>any three</b> of the following: a. What is tree? Explain binary tree with their properties. b. What is AVL tree? How balancing is done in AVL tree? Explain with example. c. Explain Selection sort and Bubble sort with example. d. Sort the following data elements using heap sort algorithm 22,35,17,8,13,44,5,28. e. What are the algorithmic steps of insertion sort method? Sort following data element using insertion sort method: - 7,8,5,2,4,6,3.	15

	f. What is Red Black tree? Explain operation on Red black tree.	
Q.5	<p>Attempt <b><u>any three</u></b> of the following:</p> <p>a. List different hashing methods. Explain with example any two of them.</p> <p>b. Define Hashing. What are the collision resolution methods in hashing?</p> <p>c. List different techniques of open addressing. Explain any one.</p> <p>d. List out the graph traversals of graph search.</p> <p>e. Define Shortest Path problem and Spanning tree with example.</p> <p>f. List graph traversal technique. Write and explain algorithm for anyone. Give suitable example.</p>	15