

5085/2
FACULTY OF SCIENCE
B.Sc. (III-Semester) Examination
COMPUTER SCIENCE
Paper-III
Data Structures Using C++

Time: 3 Hours]

[Max. Marks: 80

Section-A (Marks: 8x4=32)

1 Answer any **Eight** questions.

- a) Define Data Structure. Give a brief note on the different types of data structures.
- b) Convert the $(a + b) * c - \frac{a}{e}$ expression to postfix and prefix
- c) What is Sparse Matrix?
- d) Give a brief note on Analysis of Algorithms.
- e) State the advantages and disadvantages of single Link List over Doubly Linked List.
- f) Write the differences between Iteration versus Recursion.
- g) Construct a binary search Tree for the list 45,78,43,23,78,90,34,65,12.
- h) Write a short note on Threaded Binary Tree.
- i) Write about Symbol Tree.
- j) What is Spanning Tree.
- k) Define directed Graph?
- l) Write Heap Sort algorithm?

Section-B (Marks: 4x12=48)

Answer all questions

- 2 a) Define stack. Why is it known as LIFO? Write algorithm to perform PUSH and POP operation on stack.

(OR)

b) Explain how infix expressions are converted to polish notation. Illustrate your answer with suitable example.
- 3 a) Define Queue. Discuss about different types of Queues. Write algorithm for inserting an element in to Queue using Arrays.

(OR)

b) Define Single linked list. Write the pseudo code to insert and delete element from beginning of linked list.
- 4 a) Illustrate the binary search tree traversals with suitable examples.

(OR)

b) Write the comparison of all sorting methods with respective to time complexity.
- 5 a) Discuss in detail the Graph representation mechanisms and write the algorithm for depth first search.

(OR)

b) Define a Heap. Discuss how heap can be implemented and what are applications of Heap.
