

FACULTY OF SCIENCE
B.Sc. (CBCS) III – Semester (Backlog) Examination, August 2022

Subject: Computer Science
Paper – III: Data Structures

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer any five questions

(5 x 4 = 20 Marks)

1. Describe Pseudo-code with an example.
2. How many values can be held by an array with dimensions $C[-n...0, 1...2]$?
3. Explain Linked List Abstract Data Type.
4. What are Variants of Recursion?
5. What are the applications of Binary Tree?
6. What is Hashing? Write the importance of Hashing.
7. Write short notes on Heap Sort.
8. Explain sequential search with an example.

PART – B

Note: Answer all the questions

(4 x 15 = 60 Marks)

9. a) Write an algorithm to convert infix to postfix using stack. Explain with an example.
(OR)
b) What is Transpose? Write a C++ program for Transpose of a matrix of order 3×3 .
10. a) What is a Circular Queue? Write an algorithm to implement Circular Queues using enqueue(), dequeue() and display() operation.
(OR)
b) What is Doubly Linked List? Describe the procedures for Inserting and Deleting nodes from a Doubly Linked List with an example.
11. a) (i) Give any two representations of graphs. What do you mean by in-degree and out-degree of a graph?
(ii) Explain Depth-First-Search (DFS) using suitable example.
(OR)
b) Suppose the following list of numbers are inserted in order into an empty binary search tree:
64, 27, 88, 10, 8, 72, 17, 24, 39, 67, 11, 69, 15
(i) Construct the binary search tree.
(ii) Find the in-order, pre-order and post-order traversal of Binary Search Tree created.

12. a) Define Sorting. Write a C++ function for insertion sorting technique. Apply the function to sort the elements 61, 37, 130, 9, 89, 22, 46.

(OR)

b) (i) Compare Binary Search and Linear Search.

(ii) Write an algorithm to perform binary search on a given set of 'n' numbers using the algorithm for the element 34 in the set [22, 13, 34, 63, 48, 53, 89, 62]

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