



Seat No. _____

HN-003-2042001

**B. Sc. (IT) (Sem. II) (CBCS)
(W.E.F. 2019) Examination**

April - 2023

**CS - 07 : Data Structure Using C-Language
(Old Course)**

Faculty Code : 003

Subject Code : 2042001

Time : $2\frac{1}{2}$ Hours / Total Marks : 70

- 1 (a) Attempt the following : 4
- (1) Write full form of DFS.
 - (2) Define algorithm.
 - (3) Define Vertex.
 - (4) Explain enum.
- (b) Answer in brief : (any **one**) 2
- (1) Explain dangling pointer problem.
 - (2) Explain adjacency matrix and adjacency list.
- (c) Answer in detail : (any **one**) 3
- (1) Explain Time Complexity.
 - (2) Explain shortest path problem.
- (d) Write a note on following : (any **one**) 5
- (1) Write short note on Asymptotic notation.
 - (2) Write short note on Dynamic Memory Allocation.
- 2 (a) Attempt the following : 4
- (1) _____ Sorting algorithm is also known as bin sort.
 - (2) _____ Sort uses recursion for implementation.
 - (3) Binary search cannot be applied to _____.
 - (4) _____ sort is also known as in place comparison sort.

- (b) Answer in brief : (any **one**) **2**
 (1) Write insertion sort algorithm.
 (2) Write a program of sequential search.
- (c) Answer in detail : (any **one**) **3**
 (1) Write bucket sort algorithm.
 (2) Explain index search algorithm.
- (d) Write a note on following : (any **one**) **5**
 (1) Write a program of quick sort.
 (2) Write a program of binary search.
- 3** (a) Attempt the following : **4**
 (1) Write full form of FCFS.
 (2) In queue insertion is performed at which point?
 (3) Stack follows _____ order.
 (4) List out non-linear data structure.
- (b) Answer in brief : (any **one**) **2**
 (1) List out linear data structure.
 (2) List out applications of queue.
- (c) Answer in detail : (any **one**) **3**
 (1) Explain recursion and stack.
 (2) Explain priority queue.
- (d) Write a note on following : (any **one**) **5**
 (1) Write a program that performs all the operations on stack.
 (2) Write a program to insert, delete and display element of circular queue.
- 4** (a) Attempt the following : **4**
 (1) What is node?
 (2) Insertion of an element at the middle of a singly linked list requires the modification of how many pointers?
 (1 / 2 / 3 / 4)
 (3) Which type of linked list stores the address of the head node in the next pointer of the last node?
 (4) In which type of linked list traversals can be performed in both directions?

- (b) Answer in brief : (any **one**) **2**
- (1) Write a program that traverse the entire singly linked list.
 - (2) Write advantages of linked list over array.
- (c) Answer in detail : (any **one**) **3**
- (1) Write a C program that reverses the singly linked list.
 - (2) Write an algorithm to manipulate following operations on circular linked list.
Create, Display, Insert Last and Delete First.
- (d) Write a note on following : (any **one**) **5**
- (1) Write a menu driven singly linked list program which performs following linked list operations.
Create, Display, Insert at specific position, Delete First.
 - (2) Write a menu driven doubly linked list program which performs the following linked list operations.
Create, Display, Delete Specific, Insert Last.
- 5** (a) Attempt the following : **4**
- (1) Which type of traversal of binary search tree outputs the value in sorted order?
 - (2) Define Internal Node.
 - (3) Define Sibling.
 - (4) Define Height of a tree.
- (b) Answer in brief : (any **one**) **2**
- (1) Explain advantages of using binary search tree.
 - (2) Explain applications of tree data structure.
- (c) Answer in detail : (any **one**) **3**
- (1) Explain linked list representation of binary tree.
 - (2) Write short note on AVL tree.
- (d) Write a note on following : (any **one**) **5**
- (1) Write short note on B - Tree.
 - (2) Create a binary tree from the following and also display in order, pre order and post order traversal.
50, 40, 60, 55, 45., 35, 30, 70, 65, 25, 80