



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

<b>1</b>	<b>(a) Attempt the following :</b>	<b>4</b>
	(1) Write full form of DFS.	
	(2) Define algorithm.	
	(3) Define Vertex.	
	(4) Explain enum.	
	<b>(b) Answer in brief : (any one)</b>	<b>2</b>
	(1) Explain dangling pointer problem.	
	(2) Explain adjacency matrix and adjacency list.	
	<b>(c) Answer in detail : (any one)</b>	<b>3</b>
	(1) Explain Time Complexity.	
	(2) Explain shortest path problem.	
	<b>(d) Write a note on following : (any one)</b>	<b>5</b>
	(1) Write short note on Asymptotic notation.	
	(2) Write short note on Dynamic Memory Allocation.	
<b>2</b>	<b>(a) Attempt the following :</b>	<b>4</b>
	(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.	

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

(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