



Seat No. _____

HN-003-3042001

B. Sc. I. T. (Sem. II) (CBCS)

(W.E.F. 2022) Examination

April - 2023

CS-07 : Data Structure Using C - Language

(New Course)

Faculty Code : 003

Subject Code : 3040001

00167

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

- 1 (a) Attempt the following : 4
- (1) Backtracking algorithm is improvement of ____ algorithm.
 - (2) Define algorithm.
 - (3) Space complexity includes _____ and _____.
 - (4) _____ Asymptotic notation is an average case analysis of an algorithm.
- 1 (b) Answer in Brief : (Any One) 2
- (1) Explain dangling pointer problem.
 - (2) Explain enum.
- 1 (c) Answer in detail : (Any One) 3
- (1) Explain Big - O notation.
 - (2) List out classes of algorithm. Explain any one.
- 1 (d) Write a note on following : (Any One) 5
- (1) Write short note on DMA.
 - (2) Explain time and space complexity.

HN-003-3042001]

1

[Contd...

- 2 (a) Attempt the following : 4
- (1) Merge sort algorithm is based on _____ paradigm.
 - (2) What is pivot in quick sort algorithm ?
 - (3) What is the basic idea of shell sort ?
 - (4) Write advantage of quick sort.
- 2 (b) Answer in Brief : (Any One) 2
- (1) Write bubble sort algorithm.
 - (2) Write Linear search algorithm.
- 2 (c) Answer in detail : (Any One) 3
- (1) Write a program of insertion sort.
 - (2) Write a program that search a value from the list using index search.
- 2 (d) Write a note on following : (Any One) 5
- (1) Explain binary search algorithm.
 - (2) Write a program that arranges 10 numbers in ascending order using merge sort.
- 3 (a) Attempt the following : 4
- (1) Write full form of TOS.
 - (2) In queue deletion is performed at which point ?
 - (3) What is the main difference between Queue and Deque ?
 - (4) Stack can be implemented using _____ and _____.
- 3 (b) Answer in Brief : (Any One) 2
- (1) List out stack applications.
 - (2) List out queue applications.

- 3 (c) Answer in detail : (Any One) 3
- (1) What is data structure? Explain types of data structure.
 - (2) Write short note on priority queue.
- 3 (d) Write a note on following : (Any One) 5
- (1) Write a program that performs following operations on stack.
push(), pop(), and display()
 - (2) Write a program that performs following operations on queue.
Insert(), delete() and display().
- 4 (a) Attempt the following : 4
- (1) In linked list first node is also known as_____.
 - (2) In header linked list head node contains which types of values.
 - (3) In circular linked list next of last node contains_____.
 - (4) In doubly linked list node contains which type of values.
- 4 (b) Answer in Brief : (Any One) 2
- (1) List out application of linked list.
 - (2) Write an algorithm that insert new node at first position in singly linked list.
- 4 (c) Answer in detail : (Any One) 3
- (1) Write a program that reverses the singly linked list.
 - (2) Differentiate singly linked list and doubly linked list.

- 4 (d) Write a note on following : (Any One) 5
- (1) Write a program that performs following operations on circular linked list.
- (1) Create() (2) Display()
(3) Insert_last() (4) Delete_specific()
- (2) Write a program that performs following operations on doubly linked list.
- (1) Create()
(2) Display()
(3) Insert_specific()
(4) Delete_first()
- 5 (a) Attempt the following : 4
- (1) Define leaf node.
(2) Define Sibling.
(3) Define Vertex.
(4) Another name for the directed graph is.....
- 5 (b) Answer in Brief : (Any One) 2
- (1) Explain adjacency matrix with example.
(2) Explain B-Tree.
- 5 (c) Answer in detail : (Any One) 3
- (1) Write short note on height balanced tree.
(2) Explain depth first traversal with example.
- 5 (d) Write a note on following : (Any One) 5
- (1) Explain binary tree traversal techniques.
(2) Write short note on minimum spanning tree.