

G-2/226/21

Roll No.

M.Sc. II Semester Examination, 2021

INFORMATION TECHNOLOGY

Paper II

(Data Structures)

Time : 3 Hours]

[Max. Marks : 100

Note : All questions are compulsory. Question Paper comprises of 3 sections. Section A is objective type/multiple choice questions with no internal choice. Section B is short answer type with internal choice. Section C is long answer type with internal choice.

SECTION A

1×10=10

(Objective Type Questions)

Choose the correct answer :

1. Elements in an array are accessed
(a) Randomly (b) Sequentially
(c) Exponentially (d) Logarithmically
2. Linked list are not suitable to for the implementation of :
(a) Insertion sort
(b) Radix sort
(c) Polynomial manipulation
(d) Binary search

P.T.O.

[2]

3. Which one of the following is the process of inserting an element in the stack ?
(a) Insert (b) Add
(c) Push (d) None of the above
4. Which one of the following is not the type of the queue ?
(a) Linear queue
(b) Circular queue
(c) Double ended queue
(d) Single ended queue
5. Which of the following is the infix expression ?
(a) $A + B * C$ (b) $+ A * BC$
(c) $ABC + *$ (d) $* + ABC$
6. Which one of the following techniques is not used in the Binary tree ?
(a) Randomized traversal
(b) Preorder traversal
(c) Postorder traversal
(d) In order traversal
7. An Adjacency matrix representation of a graph cannot contain information of :
(a) Nodes (b) Edges
(c) Direction of edges (d) Parallel edges

G-2/226/21

8. The data structure required for Breadth First Traversal on a graph is :

- (a) Queue (b) Array
(c) Stack (d) Tree

9. Complexity of linear search algorithm is

- (a) $O(n)$ (b) $O(\log n)$
(c) $O(n_2)$ (d) $O(n \log n)$

10. Which of the following sorting algorithm is of divide and conquer type ?

- (a) Bubble sort (b) Insertion sort
(c) Merge sort (d) Selection sort

SECTION B

6×5=30

(Short Answer Type Questions)

Note : Answer the following questions in 250 words.

Unit-I

1. What is Data structure ? What are different classification of data structure ? Explain with example.

Or

Discuss the insertion and deletion for circular linked list.

Unit-II

2. What do you understand by a stack ? Describe stack operations.

Or

Define queue. How insertion and deletion operations are performance over a queue.

Unit-III

3. What are AVL tree ? What are its advantages ?

Or

What is tree ? Explain Binary tree, complete binary tree and almost complete binary tree.

Unit-IV

4. Write Dijkstra's algorithms to find the shorted path.

Or

Differentiate between depth first search and breadth first search.

Unit-V

5. Write an algorithm for selection sort.

Or

What is Hosting ? Explain different Hash function method in detail.

(Long Answer Type Questions)

Note : Answer the following questions in 500 words.

Unit-I

1. What do you mean by Array ? Describe the storage structure of array. Also explain various types of array in detail.

Or

What is linked list ? Write an algorithm for deleting an item from a linked list.

Unit-II

2. What is Queue ? Why it is known as FIFO ? Write an algorithm to insert and delete an element from a simple queue.

Or

What is stack ? Why it is known as LIFO ? Write an algorithm using PUSH and POP.

Unit-III

3. Explain inorder, preorder and postorder traversals operations on binary tree with example.

Or

What is Binary search tree ? Explain its types with example.

Unit-IV

4. What is spanning tree ? Explain spanning tree in detail with example.

Or

Explain the various graph representation methods. List merits and demerits of each.

Unit-V

5. What do you mean by searching ? Explain linear search and binary search with example.

Or

Define insertion sort. How insertion sort work ? Write an algorithm for insertion sort.

★ ★ ★ ★ ★ c ★ ★ ★ ★ ★