Roll No. .....

E–572

M. Sc. (IT) (Second Semester) (Main/ATKT) EXAMINATION, May-June, 2021

Paper Second

DATA STRUCTURE

(202)

Time : Three Hours] [*Maximum Marks : 100*

Note : Attempt all Sections as directed.

Section—A 1 each

(Objective/Multiple Choice Questions)

Note : Attempt all questions.

Choose the correct answer :

1. An array is a :
   (a) Collection of homogeneous data elements
   (b) Collection of heterogeneous data elements
   (c) Both (a) and (b)
   (d) None of the above
2. Following is a non-linear data structure :
   (a) Stack

   (b) List
   (c) Array
   (d) Graph
3. A linear data structure in which pointers are used to find next element in order is :
   (a) Array
   (b) Linked List
   (c) Big O
   (d) None of the above
4. In double Linked List the traversal can be performed :
   (a) Only in forward direction
   (b) Only in backward direction
   (c) Both (a) and (b)
   (d) None of the above
5. Stack is also called :
   (a) Last in first out
   (b) First in first out
   (c) Both (a) and (b)
   (d) None of the above
6. Which data structure allows insertion from last and deletion from first position ?
   (a) Stack
   (b) Queue
   (c) Both (a) and (b)
   (d) None of the above

7. The data structure which can be used to check weather a given expression contains balanced parenthesis is :
   (a) Stack
   (b) Queue
   (c) Array
   (d) Tree

8. Process of inserting the element at the end of queue is known as :
   (a) Deque
   (b) Enqueue
   (c) Push
   (d) Pop

9. To represent hierarchical relationship between elements of data structure we use :
   (a) Deque
   (b) Priority Queue
   (c) Stack
   (d) Tree

10. Header node is used as a sentinel in :
   (a) Stack
   (b) Queue
   (c) Binary Tree
   (d) None of the above

11. A node in the path from root node to any given node is called :
   (a) Successor
   (b) Ancestor
   (c) Internet node
   (d) None of the above

12. Traversing the binary tree in order of first the root then left sub-tree the right sub-tree is called :
   (a) Postorder
   (b) Preorder
   (c) Inorder
   (d) None of the above

13. A degree of any vertex of a graph is :
   (a) The number of edges incident with vertex
   (b) Number of vertex in graph
   (c) Both (a) and (b)
   (d) None of the above

14. A graph is a collection of :
   (a) Rows and columns
   (b) Vertices and edges
   (c) Equations
   (d) None of the above

15. A Null graph has :

    (a) No nodes

    (b) No vertices

    (c) No edges

    (d) All of the above

16. A graph can be called a tree if it is :

    (a) Directed

    (b) Acyclic

    (c) Planar

    (d) Completely connected

17. Binary search requires :

    (a) A heap

    (b) Array size to be power of 2

    (c) Sorted array

    (d) None of the above

18. The worst case of linear search happens when :

    (a) Item is near middle of array.

    (b) Item is either at last or not at all in the list.

    (c) Both (a) and (b)

    (d) None of the above

19. ..... Algorithm is used when number of elements to be sorted is small.

    (a) Heap Sort

    (b) Insertion Sort

    (c) Bubble Sort

    (d) Quick Sort

20. Merge Sort is based on the following technique :

    (a) Dynamic Programming

    (b) Backtracking

    (c) Divide and Conquer

    (d) Greedy Method

Section—B 2 each

(Very Short Answer Type Questions)

Note : Attempt all questions in 2-3 sentences.

1. Explain time and space analysis of algorithm.
2. What are Multidimensional Arrays ?
3. What is Polish Notation ?
4. Describe Recursion.
5. What is a Complete Binary Tree ?
6. Describe Heap.
7. Describe Minimum Spanning Tree.
8. Describe Adjacency List.
9. What is Selection Sort ?
10. What is Collision ?

Section—C 3 each

(Short Answer Type Questions)

Note : Attempt all questions using less than 75 words.

1. Describe the Representation of Linked List in Memory.
2. Explain Header Linked List.
3. Describe the Concept of Queue.
4. Explain Linked Representation of Stack.
5. Describe Threads in Binary Trees.
6. Explain Expression Trees.
7. Explain Adjancy Matrix with example.
8. Describe shortest path algorithm.
9. Explain the advantages of Heap Sort.
10. Describe disadvantages of Radix Sort.

Section—D 6 each

(Long Answer Type Questions)

Note : Attempt all questions using 150 words.

1. Explain Data Structure Concept and its types.
2. Explain Stack Push algorithm.
3. Explain Tree and Tree types.
4. Explain Traversal Schemes in graphs.
5. Explain Linear Search.