Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[5559]-204

S.E. (I.T.) (First Semester) EXAMINATION, 2019

FUNDAMENTALS OF DATA STRUCTURES

(2015 PATTERN)

Time : 2 Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Answer Q. **1** *or* Q. **2**, Q. **3** *or* Q. **4**, Q. **5** *or* Q. **6** and Q. **7** or Q. **8**.

(*ii*) Neat diagrams must be drawn wherever necessary.

(*iii*) Figures to the right side indicate full marks.

(*iv*) Assume suitable data if necessary.

1. (*a*) Explain the need of parameter passing in functions. Demonstrate different types of parameter passing in C with example for each. [6]

(*b*) Explain how strings are represented in C. Write a psudo code for checking whether given string is a palindrome or not. [6]

Or

2. (*a*) Write a psudo code to store heights of N students dynamically and find average height. [Use Malloc( )] [6]

(*b*) Explain difference between structure and union. Demonstrate each with example. [6]

P.T.O.

3. (*a*) Discuss in detail the different asymptotic notations used to represent time complexity of an algorithm. [6]

(*b*) With example, discuss the criteria for choosing a sorting algorithm based on the input size and time complexity.

[Trade-off bubble, insertion and quicksort] [6]

Or

4. (*a*) For the following set of numbers, perform stepwise demonstration of merge-short algorithm :

91 23 48 13 97 63 27 36 57 [6]

(*b*) Demonstrate how to access elements of an array using pointer notation. Write psudo code to find max-element in an array of size, using pointer notation. [6]

5. (*a*) Describe significance of sparse matrix. With example demonstrate the steps of sparse matrix addition. [8]

(*b*) Explain representation of polynomial node using array and using structure. [6]

Or

6. (*a*) Explain the following Linear Data structures : [8]

(*i*) Stack

(*ii*) Queue.

(*b*) Represent the following polynomials using array : [6]

(*i*) $3x^{14} + 2x^{-8} + 1$

(*ii*) $15x^3y^2| - 10x^2 + 7y - 10$.

7. (*a*) What is ADT ? Explain singly linked list as ADT. [6]

(*b*) Explain with example : [6]

(*i*) Doubly linked list

(*ii*) Circular linked list.

Or

8. (*a*) Write C function for inserting and deleting a node of SLL. [6]

(*b*) Represent the following list using GLL : [6]

(*a*, (*b*, *c*), (*d*, (*c*, *f*, *g*)), *h*).