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

Seat No.	

[5352]-574

S.E. (I.T.) (I Sem.) EXAMINATION, 2018
FUNDAMENTALS OF DATA STRUCTURE
(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. :— (*i*) Answer *four* questions.
(*ii*) Neat diagrams must be drawn wherever necessary.
(*iii*) Figures to the right indicate full marks.
(*iv*) Assume suitable data, if necessary.

1. (*a*) Explain working of different logical operators in C with examples. [3]

(*b*) Explain use of "break" and "continue" keywords in C with suitable examples. [3]

(*c*) Explain the different modes of opening text and binary files in C using fopen() function. [6]

OR

2. (*a*) What is ouput of following code: [2]

```
int aaray[]={45,67,89};
int *p=array;
printf("%d", *(p++));
printf("%d", *p);
```

(*b*) What is purpose of structure in C? Is it possible to define structure into the structure? Explain with suitable examples. [4]

(*c*) What are different methods for passing parameters to function? Write how array can be efficiently passed to a function with example. [6]

3. (*a*) Explain the following terms i)malloc() ii)calloc() iii)realloc() iv) free() [6]

(*b*) What is the importance of pivot elements in the quick sort method? [2]

(*c*) Write pseudo C code for bubble sort? Show its working pass by pass for following data : 10, 4, 55, 21, 6 [4]

P.T.O.

OR

4. (*a*) Explain the following terms [3]

   i) Big Oh notation
   ii) Omega Notation
   iii) Theta Notation

   (*b*) What is Persistent and Ephemeral data structure? [3]

   (*c*) Write pseudo code for non-recursive binary search function and comment on its time complexity in best, average and worst cases. [6]

5. (*a*) Write address calculation for elements of one dimensional array. [2]

   (*b*) Explain sequential memory organization with example. [4]

   (*c*) Write an algorithm to add two sorted polynomial in a single variable. Analyze its time complexity. [7]

OR

6. (*a*) Explain the two dimensional arrays in details with column and row major implementation and address calculation in both the cases. [6]

   (*b*) What is sparse matrix? Explain how it is represented. Write C pseudo code for addition of two sparse matrices. What is its time complexity? [7]

7. (*a*) Explain concept of generalized linked list with example? [4]

   (*b*) Write advantages of circular linked list over linear linked list. [2]

   (*c*) What is Doubly Linked List? Write C code to delete a node from DLL.at following positions: [7]

   i) At the beginning

   ii) In the middle

   iii) At the end

OR

8. (*a*) Compare linked list with arrays with reference to the following aspects: [6]

   i) Accessing any element randomly

   ii) Insertion and deletion of an element

   iii) Utilization of memory

   (*b*) What is Singly Linked List (SLL)? Write C pseudo code for performing following operations on SLL: [7]

   i) Insert element at any position

   ii) Reverse the list without using additional data structure