Total No. of Questions—**12**] [Total No. of Printed Pages—**4**

Seat No.	

[4957]-212

S.E. (IT) (I Sem.) EXAMINATION, 2016

FUNDAMENTAL OF DATA STRUCTURE

(2008 PATTERN)

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

N.B. **:—** (*i*) Answer Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6** from Section I and Q. No. **7** *or* Q. No. **8**, Q. No. **9** *or* Q. No. **10**, Q. No. **11** *or* Q. No. **12** from Section II.

(*ii*) Answers to the two Sections should be written in separate answer-books.

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

(*iv*) Figures to the right indicate full marks.

(*v*) Assume suitable data, if necessary.

SECTION I

1. (*a*) Explain arrays with example. [6]

(*b*) Explain enumerated data type with example. [4]

(*c*) What is Macro ? What are its advantages and disadvantages ? [6]

P.T.O.

Or

2. (*a*) Write a C program to swap two numbers using call by reference. [6]

(*b*) Compare structure and union. [4]

(*c*) What is Static variable in 'C' ? Explain the use of static variable with suitable example. [6]

3. (*a*) Explain call by value and call by reference with example. [8]

(*b*) Write a C program to accept, display and find topper from a list of n students using functions. [8]

Or

4. (*a*) Write a C program to compare two strings without using library function. [8]

(*b*) What is a pointer variable ? Explain declaration, initialization and accessing a pointer variable with an example. [8]

5. (*a*) Explain the following terms with examples : [6]

(*i*) Data object

(*ii*) Data type

(*iii*) Data structure.

(*b*) Write C functions for the following on a list of n numbers stored in an array : [12]

(*i*) Find sum of all elements

(*ii*) Find maximum number

(*iii*) Print reverse recursively.

Or

6. (*a*) Explain non-linear data structures with example. [6]

(*b*) Define time and space complexity of an algorithm. Write C program for bubble sort and analyze its time complexity using big-oh notation. [12]

SECTION II

7. (*a*) Write a C program for selection sort. Analyze its time complexity. Compare selection and bubble sort. [10]

(*b*) What are advantages of sorting data ? Explain insertion sort with an example. [6]

Or

8. (*a*) Write C program for bubble sort. Show output of each pass to arrange the following numbers in ascending order : [10]

–10, 29, 38, –67, 6, 65, 84, 3, 2, –1.

(*b*) Explain linear and binary search techniques with examples. [6]

9. (*a*) Represent sparse matrix using suitable data structure. Write a C program for addition of two sparse matrices. Analyze its time complexity. [12]

(*b*) Explain the concept of row major address calculation for multidimensional array with the suitable example. [6]

Or

10. (*a*) Write a C program to obtain transpose of sparse matrix using fast transpose algorithm. Discuss its time complexity. [12]

(*b*) What is sparse matrix ? What are its applications ? [6]

11. (*a*) Write a C program for inserting a node at start and at the end in SLL. [10]

(*b*) Explain applications of circular linked list. [6]

Or

12. (*a*) Write a C program for deletion of node from DLL from first and last position. [10]

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

(*i*) G = ((*a*, *b*), ((*c*, *d*), *e*))

(*ii*) (*p*, *q*, (*r*, *s*, (*t*, *u*, *v*), *w*), *x*, *u*).