Total No. of Questions—**8**] [Total No. of Printed Pages—**4**

Seat No.	

[4657]-583

S.E. (Information Technology)

(First Semester) EXAMINATION, 2014

FUNDAMENTALS OF DATA STRUCTURES

(2012 PATTERN)

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

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**, Q. No. **7** *or* Q. No. **8**.

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

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

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

1. (*a*) Differentiate between pass by reference and pass by value. [4]

(*b*) Explain the different modes of opening a file in C using fopen( ) function. [6]

(*c*) What will be the output of the following code snippets ? [2]

(1)
```
#define M(x) x * x
main( )
{
    printf("%d", M(2+3))
}
```

P.T.O.

(2) Main( )

```
{
    int x;
    x = 4 + 2% – 8;
    printf("%d", x);
}
```

Or

2. (*a*) What is macro ? What are its advantages and disadvantages ? [4]

(*b*) Explain the use of break and continue keywords in C with suitable example. [4]

(*c*) Write a C function to compare two strings. [4]

3. (*a*) Show the output of each pass using bubble sort to arrange the following numbers in ascending order.

90, 87, 76, 65, 43, 32, 19, 7, 0, –17. [6]

(*b*) Explain the following terms : [3]

(*i*) Data Object

(*ii*) Data Type.

(*c*) What is space complexity of an algorithm ? Explain its importance with example. [3]

Or

4. (*a*) Explain the following terms : [6]

(*i*) Internal sorting

(*ii*) External sorting

(*iii*) Sort stability.

(*b*) Explain the different asymptotic notations. [3]

(*c*) Explain with example the linear data structure. [3]

5. (*a*) Represent the sparse matrix using suitable data structure and write a pseudo C code to find transpose of a spare matrix using slow transpose. [7]

(*b*) Explain the concept of column major address calculation for multidimensional array with suitable example. [4]

(*c*) Represent the following polynomials using arrays : [2]

(*i*) $x^3 + 2xy + y^3 - y + x$

(*ii*) $5x^2 + 10xy + y^2 - 20$.

Or

6. (*a*) Write a pseudo C algorithm for addition of two sparse matrices. Analyze its time complexity. [7]

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

(*c*) What is sparse matrix ? Explain how it is represented. [2]

7. (*a*) Suppose a Linked List consists of numerical values. Write a function for finding the maximum element of the List and the product of all the numbers in the List. [7]

(*b*) Write a C code for reversing the Singly Linked List without using additional data structure. [6]

Or

8. (*a*) Write a pseudo code to merge two Sorted Linked Lists into the third. [7]

(*b*) Explain GLL. Represent following polynomial using GLL [6]

(L, (M, (N, (O, P)), Q), R, (S, T), (A, (B, C)))