Seat	
No.	

[4657]-583

S.E. (Information Technology) (First Semester) EXAMINATION, 2014 FUNDAMENTALS OF DATA STRUCTURES (2012 **PATTERN**)

Time : Two Hours

- 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.
 - Neat diagrams must be drawn wherever necessary. (ii)
 - Figures to the right indicate full marks. (iii)
 - (iv)Assume suitable data, if necessary.
- 1. Differentiate between pass by reference and pass by value. [4] (a)
 - *(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.

Maximum Marks : 50

```
(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]

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- Explain the following terms : [6] **4**. (a)*(i)* Internal sorting (*ii*) External sorting (iii) Sort stability. *(b)* Explain the different asymptotic notations. [3] Explain with example the linear data structure. [3] (c)5. *(a)* Represent the sparse matrix using suitable data structure and write a pseudo C code to find transpose of a spare matrix
 - (b) Explain the concept of column major address calculation for multidimensional array with suitable example. [4]

using slow transpose.

(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]

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P.T.O.

[7]

- (b) Explain sequential memory organization with example. [4]
- (c) What is sparse matrix ? Explain how it is represented. [2]
- (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)))