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Seat No.	
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S.E. (information Technology) (Semester – I) Examination, 2014
FUNDAMENTALS OF DATA STRUCTURES
(2012 Course)

Time : 2 Hours

Max. Marks : 50

Instructions : 1) Answer **four** questions.
2) **Neat** diagrams must be drawn **wherever** necessary.
3) Figures to the **right** side indicate **full** marks.
4) Use of calculator is **allowed**.
5) Assume suitable data if **necessary**.

1. a) Explain entry controlled loop structures in C. 4
b) Write pseudo C/C++ algorithm to concatenate two strings using pointers without using library functions. 4
c) Explain any four bitwise operators in C with example. 4

OR

2. a) Explain use of pointer to array of structure with suitable example. 4
b) Explain different storage classes in C. 6
c) Write use of void data type. 2
3. a) Explain Big-oh, omega and theta notation with example. 6
b) Sort the following list in ascending order using bubble sort. Show all passes. Analyze time complexity. 6
9, 7, -2, 4, 5, 3, -6, 2, 1, 8

OR

4. a) Write different types of data structures. Give one example of each type. 6
b) Sort the following list using merge sort 4
38, 27, 43, 3, 9, 82, 11, 10
c) Compare linear and binary search. 2
5. a) What is recursion ? Explain role of stack in recursion. Write recursive function to add digits of a given positive integer. 6
b) Write a C/C++ function to add two sparse matrices. Analyse its time complexity. 6
c) Write address calculation for elements of one dimensional array. 2

OR

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6. a) Write pseudo C/C++ algorithm to find transpose of sparse matrix using fast transpose algorithm. **6**
b) Explain row and column major storage representation of two dimensional array. **6**
c) Write a non-recursive algorithm to find factorial of a positive number. **2**
7. a) Write a C/C++ program to create singly inked list of integers and display it forward. **6**
b) Write node structure and represent following list using generalized linked list. **4**
(A, B, (C, D, E), F, (G, H, (I, J), K), L)
c) Write advantages of linked memory organization. **2**

OR

8. a) Write pseudo C/C++ algorithm to add two sorted polynomials represented by SLL. **6**
b) What is generalized list ? Give node structure to represent multivariable polynomial using GLL. **4**
c) Write advantages of circular singly linked list over a linear linked list. **2**
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