



## ***B.Tech. Degree IV Semester Examination April 2014***

### **IT/CS 1405 DATA STRUCTURES AND ALGORITHMS** (2012 Scheme)

Time : 3 Hours

Maximum Marks : 100

#### **PART A** (Answer *ALL* questions)

(8 x 5 = 40)

- I. (a) Explain binary search algorithm with example.
- (b) Explain different hash functions. What are the properties of a good hash function?
- (c) Compare and contrast array representation and linked list representation of linear lists.
- (d) Explain stack data structure and basic operations of stack.
- (e) How is a binary tree represented using array?
- (f) What is a TBT (Threaded Binary Tree)?
- (g) Explain graph representation using adjacency matrix.
- (h) Explain minimum spanning tree.



#### **PART B**

(4 x 15 = 60)

- II. Write the algorithm for quick sort. Explain the algorithm with an example. (15)
- OR**
- III. Explain merge sort algorithm with example (15)
- IV. (a) Write a general algorithm for the conversion of infix expression to postfix expression and explain with example. (10)
- (b) Explain priority queue. (5)
- OR**
- V. (a) Implement a linked list with the following operations: (10)
  - (i) Add a node with a given value to the front of the list.
  - (ii) Traverse the list.
  - (iii) Add a node with a given value after a specified node.
  - (iv) Delete a node with a given value from the list.
- (b) Explain Dequeue. (5)
- VI. (a) Explain binary search tree with examples. Explain any of its application. (7)
- (b) Explain different binary tree traversals with examples. (8)
- OR**
- VII. (a) Explain different binary tree representation methods (8)
- (b) Explain AVL trees. Mention its properties. (7)
- VIII. Explain various graph traversal methods. (15)
- OR**
- IX. Explain B Trees and B+ Trees (15)

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