Printed Pages : 3

NEC401

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 131405

Roll No.

B.Tech

(SEM. IV) THEORY EXAMINATION 2014-15

DATA STRUCTURE

Time : 3 Hours] [Total Marks : 100

Note: Attempt All Questions. All Questions carry equal marks:-

1 Attempt any **FOUR** of the following questions: **5x4=20**

(a) Explain merits and demerits of static and dynamic memory allocation techniques.

(b) What is asymptotic notation? Explain the Big 'O' notation.

(c) What is Sparse Matrix? Discuss it's representation in term of lower triangular matrix.

(d) What is Link list? How it is different from an array?

(e) Write an algorithm to insert and delete an item from the circular link list.

(f) Differentiate between overflow and underflow condition in link list.

2 Attempt any **TWO** of the following questions: **10x2=20**

(a) Convert E=abcde^^*+ postfix expression to infix and prefix using stack.

(b) What is recursion? Write a recursive solution to solve TOWERS of HANOI problem.

(c) How would you implement a queue of stacks? Write routines to implement the appropriate operations for this data structure.

3 Attempt any **TWO** of the following questions: **10x2=20**

(a) Prove and explain that a strictly binary tree with 'n' leaves contains `2n-1' nodes.

(b) Construct a tree for the following preorder and postorder and write its inorder traversal.
Preorder: 24,14,13,19,17,15,10,5,8,6,7,20.
Postorder: 13,15,17,10,19,14,7,6,20,8,5,24

(c) Explain threaded binary tree. How it would be useful and efficient in implementing the tree traversal?

4 Attempt any **TWO** of the following questions: **10x2=20**

(a) Explain Depth First Search. Give example to support your explanation.

(b) Explain Kruskal's algorithm to find minimum spanning tree in a weighted directed graph. Can there be two minimum spanning trees of given weighted directed graph?

(c) How can you find shortest path between two nodes in a graph by Dijikstra algorithm? Explain by suitable diagram.

5 Attempt any **TWO** of the following questions: **10x2=20**

(a) With the help of algorithm explain the binary search and also discuss it's time complexity.

(b) Write and explain the bubble sort algorithms for a given set of 'n' data's where `k^{th}' is the largest data.

(c) Compare and contrast average case behavior of Quick Sort and Merge Sort.
