

Printed Pages : 3



NEC401

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

PAPER ID : 131405

Roll No.

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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**
- Explain merits and demerits of static and dynamic memory allocation techniques.
 - What is asymptotic notation? Explain the Big 'O' notation.
 - What is Sparse Matrix? Discuss it's representation in term of lower triangular matrix.
 - What is Link list? How it is different from an array?
 - Write an algorithm to insert and delete an item from the circular link list.
 - Differentiate between overflow and underflow condition in link list.

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[Contd...

- 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 Dijkstra 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 its time complexity.
- (b) Write and explain the bubble sort algorithms for a given set of 'n' data's where 'kth' is the largest data.
- (c) Compare and contrast average case behavior of Quick Sort and Merge Sort.
