

# END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY-JUNE 2014

Paper Code: BCA-108

Subject: Data Structure Using C  
(2011 Onward)

Time : 3 Hours

Maximum Marks: 75

Note: Attempt any five question, including Q.no.1 which is compulsory.  
Select one question from each Unit.

- Q1 (a) What do you mean by data structure? Explain the difference between linear and non-linear data structures.  
(b) Explain the sparse matrix & its representation.  
(c) Prove that in a complete binary tree of height h, total no. of nodes are  $2^{h+1}-1$ .  
(d) What is an AVL tree? Why is it useful in searching?  
(e) Explain binary search with suitable example. (5x5=25)

## Unit-I

- Q2 (a) Write a c program that takes an input expression in infix notation and convert it into postfix notation. (8)  
(b) Give an algorithm for insertion of an element in circular queue. (4.5)
- OR
- Q3 (a) Write a c function that reverse a string and finds its length. (6)  
(b) Implement an stack using linked list. (6.5)

## Unit-II

- Q4 (a) Write a c function that takes a linear linked list as its input and display it in the reverse order. (6)  
(b) Write a c-function that concatenates two linear linked list. (6.5)
- OR
- Q5 Define binary search tree. Write algorithms for pre-order, post-order & in-order traversal of a binary tree. (12.5)

## Unit-III

- Q6 (a) Define the time complexity & search a node in a binary search tree. Whether your time complexity is ratio for left or right skew & binary search tree? Justify. (6)  
(b) Explain the insertion of a node in B-tree. (6.5)
- OR
- Q7 What do you mean by binary search tree based indexing? How is it different from multilevel indexing? (12.5)

## Unit-IV

- Q8 Explain selection sort and merge sort with suitable example. Show various stages. (12.5)
- OR
- Q9 (a) How linear search is used to find an element? (6)  
(b) Explain the concept of collision in hashing and its remedies. (6.5)

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