(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY-JUNE 2019

Paper Code: BCA-108 **Subject: Data Structures Using C**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions including Q.no.1 which is compulsory.

Q1 Attempt following in brief **(Any Five)**: **(5x5=25)**

(a) Explain array implementation of Priority queues and list implementation of Priority queues.
(b) Describe Multi way search trees and its operations in detail.
(c) Illustrate the linked list representation of list.
(d) Explain the algorithms for Garbage collection.
(e) Write a program to insert an element in sorted array at its deserving position and explain.
(f) Explain Sparse Matrices and their types with the help of suitable example.
(g) Write a program to implement linear link list, showing all the operations that can be performed on a linked list.

Q2 (a) The in-order and pre-order traversal of a tree are given below. Construct corresponding binary tree. Write its equivalent post order traversal. **(6)**

Inorder : DBMINEAFCJGK

Preorder : ABDEIMNCFGJK

(b) Create a stack of integer using a program. Make provision for checking overflow and underflow conditions. **(6.5)**

Q3 (a) Write an algorithm which convert infix expression into postfix expression. **(6)**

(b) Convert following infix expression into equivalent post fix expression **(6.5)**
A+B*C-D/E

Q4 (a) Insert following values in BST and show the resultant tree **(6)**

12, 3, 4, 5, 11, 20, 54

(b) Traverse the binary search tree made in section (a) in pre-order, in-order and post-order. **(6.5)**

Q5 (a) Write a neat algorithm for Merge Sort and explain. **(6)**
(b) Perform the Merge Sort on following data: **(6.5)**
12, 34, 43, 2, 1, 5, 6, 32, 90, 18

Q6 (a) How two dimensional errors are internally stored? What is column major and row major matrixes? **(6)**
(b) Write a neat algorithm for selection short and perform it on the following data: **(6.5)**
12, 23, 3, 4, 5, 65, 76, 6, 54, 43, 32, 2

Q7 (a) Differentiate between left skew and right skew binary search tree. **(6)**
(b) What are the disadvantages of binary search tree? How AVL tree can compensate for these disadvantages? Explain using suitable example. **(6.5)**

Q8 (a) Explain B+tree. How multi-level indexing can be achieved using B+ tree? Explain any one application of B+tree. **(6)**
(b) Create the B+ tree for the following insertions when the order is 3. **(6.5)**
12,24,35,46,68,77,82,19,11,90,13,87,65,54,23,88,33,99,22

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