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CSIT124
[ET]

Enrol. No. .....

END SEMESTER EXAMINATION : NOV.–DEC., 2018

DATA STRUCTURES USING C

Time : 3 Hrs. *Maximum Marks : 70*

Note: ***Attempt questions from all sections as directed.***

SECTION – A **(30 Marks)**

Attempt any **five** *questions out of* **six.**
Each question carries **06** *marks.*

1. Construct the AVL tree by inserting the following elements in the order of their occurrence.

   58, 10, 36, 22, 18, 150, 89, 72

2. (a) An array A(–10:20, 0:15, 5:18) is given. Base address of an array A is 4950 and number of words per memory cell is 4. Find the location of A[15,12,13] of an array using

   (i) Row major Order

   (ii) Column major Order (3)

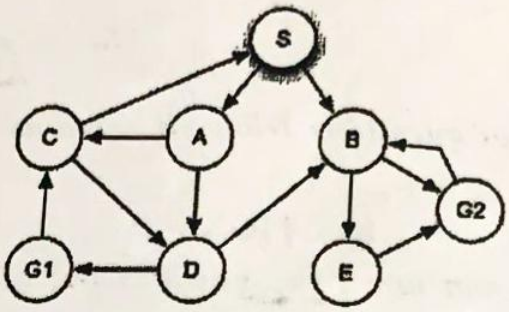
   (b) Write an algorithm to insert an element at the beginning of an array. (3)

P.T.O.

3. Evaluate the given expression using postfix expression evaluation algorithm.

   65+(3↑4/9–4*9/6)–38

4. State depth first search (DFS) algorithm and use the algorithm to find a path from node A to node G.



5. Write a program in C to delete a node with an item of information from the linked list.

6. Sort the given list in ascending order using Heap sort algorithm. Also find the complexity of heap sort.

   74, 39, 64, 12, 45, 28, 08, 56, 93, 84

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

(a) A binary tree has 9 nodes. The Preorder and Inorder traversals of the tree are given below.

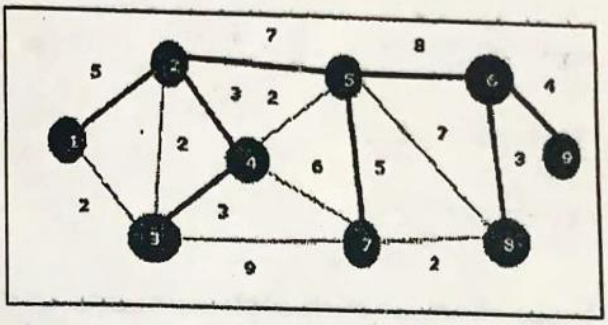
Preorder – A B C D E F G H I

Inorder – B C A E D G H F I

Draw the tree. (5)

(b) Write an algorithm to insert an element in a circular queue. (5)

8. (a) State Kruskal's Algorithm. Use the algorithm to obtain the minimum spanning tree for the following graph. (5)



(b) Write an algorithm to search for an item of information using Binary Search. Under what condition this particular method can be applied. (5)

9. (a) Write an algorithm to perform matrix multiplication. (4)

(b) Build a B-Tree of order 5 for the given list of elements. 8, 96, 7, 55, 86, 104, 116, 110, 37, 2, 145, 137, 4, 5, 58, 6 (6)

P.T.O.

SECTION – C (20 Marks)

(Compulsory)

10. (a) Imagine an effective dynamic structure for storing polynomials. Write program for addition, subtraction, and multiplication of polynomials.

I/O description.

(i) p1 = 3x^7 + 5x^6 + 22.5x^5 + 0.35x – 2

(ii) p2 = 0.25x^3 + .33x^2 – .01

(iii) p1 + p2

(iv) p1 – p2

(v) p1 * p2. (12)

(b) State shortest path algorithm and use the algorithm to find out weighted path matrix for the given graph. (8)