Exam.Code:0929
Sub. Code: 33670

2076

B.E. (Electronics and Communication Engineering)

Fifth Semester

EC-507: Data Structure and Algorithms

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

Q1. (a) Give a brief description of traversing, sorting and searching operations in data structures.

(b) What is the difference between local variables, parameters and global variables?

(c) List one advantage and disadvantage of using linked lists.

(d) Define a complete binary tree. Show a suitable example.

(e) What is significance of garbage collection? (5x2)

Part-A

Q2. (a) Simulate the following arithmetic infix expression, Q into its equivalent postfix expression, P.

Q: A + (B * C – (D / E ↑ F) * G) * H

(b) Consider multi-dimensional arrays A and B declared using A (-2:2, 2:22) and B (1:8, −5:5, -10:5)

(i) Find the length of each dimension.

(ii) Find the number of elements in arrays A and B. **(2x5)**

Q3. (a) What do you understand by the term algorithm complexity? Elaborate the time and space complexity representations used to represent various sorting algorithms.

(b) Suppose a data set S contains n elements. (a) Compare the running time T1 of the linear search algorithm with the running time T2 of the binary search algorithm when (i) n = 100 and (ii) n = 1000. (b) Discuss searching for a given item in S when S is stored as a linked list. **(2x5)**

P.T.O.

Q4. (a) Draw and explain the procedure of insertion and deletion operations in a linked list.

(b) Explain the concept of bubble sort algorithm. Find the number C of comparisons and the number D of interchanges which alphabetize the n = 5 letters in ARRAY.

(2x5)

Part-B

Q5. (a) Apply insertion sort algorithm for an array, A having 8 elements as follows: 77, 33, 44, 11, 88, 22, 66, 55

(b) Explain how the following list of numbers can be sorted using radix sort: 348, 143, 361, 423, 538, 128, 321, 543, 366 **(2x5)**

Q6. (a) A binary tree, T has 9 nodes. The inorder and preorder traversals of T yield the following sequence of nodes: Inorder: E A C K F H D and Preorder: F A E K C D H. Construct the binary tree, T.

(b) Define a heap and discuss its types using suitable examples. **(2x5)**

Q7. (a) Explain the process of Depth first search with the help of an example.

(b) Write a short note on AVL trees and its various operations to balance the tree.

(2x5)

x-x-x