

Th-2 Data Structure

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. Name two linear and nonlinear data structure.
 - b. What are the methods to implement queue in memory?
 - c. Convert the infix expression $(A-B/C)*(D/E-F)$ into a postfix.
 - d. Name two searching technique. In a sorted array, which searching technique can be used?
 - e. Write the output.
`int a[] = {1,2,3,4}; int b[4] = {5,6,7,8};
printf("%d,%d", a[0], b[0]);`
 - f. `char str1[20]="hello", str2="world";
printf("%s\n",strcat(str2,str1));`
 - g. Define garbage collection.
 - h. What is complete binary tree?
 - i. Define adjacent nodes?
 - j. What do you mean by open addressing?
2. Answer **Any Six** Questions 6 x 5
 - a. Define array. Write an algorithm for insertion in an array.
 - b. State the difference between stack and queue.
 - c. Define string and discuss about different string function with example.
 - d. Define tree. Discuss how tree can represent in memory.
 - e. Define linked list. Discuss about different type of linked list. Write the advantages of Linked List over an array.
 - f. Discuss about different hashing functions.
 - g. Explain complexity of an algorithm and the space time trade off of an algorithm.
3. Write an algorithm for bubble sort and explain it with an example. 10
4. List various fundamental file organization techniques and explain each in brief. 10
5. Define queue and write an algorithm for insertion and deletion from a queue. 10
Discuss about circular queue insertion and deletion with example.
6. Discuss following with reference to graphs. 10
 - (i) Directed graph (ii) Undirected graph (iii) Degree of vertex
 - (iv) Null graph (v) Acyclic Graph.
7. Create a Binary Search Tree for the following data and do in-order, Preorder and 10
Post-order traversal of the tree. 50, 60, 25, 40, 30, 70, 35, 10, 55, 65, 5