Paper Code -TCS 303/TIT303 121 Printed page: 2

Paper ID and Roll No. to be filled in your Answer book
Roll. No.

B. Tech.
Data Structures

[Time: 3Hours] *Total Marks: 100*

Note: Attempt all question

Q:-1 Attempt any 4 questions **5X4**

(a) Diffrentiate between stack and queue? Write algorithm for deletion of element in satck.
(b) What do you mean by Insertion and Bubble sort? Explain these with the help of suitable example.
(c) Explain Asymptotic notation big oh, big omega ,big theata.
(d) What are advantages of linked list over array?
(e) What are various applications of Linked-list? Also write an algorithm to insert an item in two-way list.
(f) Define Complete Binary Tree. Explain the different ways of traversing a binary tree.

Q:-2 Attempt any 4 questions **5X4**

(a) Explain address calculation in array with suitable example.
(b) Evaluate the following expression.Assume a=1,b=2,c=3,E= abc+*cba-+*.
(c) Convert infix to prefix: - a+ (b+c*d+e) +f/g
(d) Convert infix to postfix:- (A$B)*C-(C+D)/A/(E+E)
(e) Write a Pseudo Code for insertion and deletion in Binary Search Tree. Find out running time of insertion and deletion in BST.
(f) What do you mean by Huffman Algorithm and also show its working?

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Q:-3 Attempt any 2 questions **10X2**

(a) What are the limitations of linear queue? How it is eliminated by circular queue. Write algorithm for insertion of element in circular queue.

(b) What is circular queue? Write a program to delete an item in the circular queue.

(c) What is Binary search Tree? Explain with example. Consider the postorder and inorder for a binary tree:
Postorder: 4, 11,5,3,8,5,10,9,2,1
Inorder: 4,3,11,5,1,8,2,17,10,9

Q:-4 Attempt any 2 questions **10X2**

(a) What do you mean by merge sort? Apply merge sort on the following list:
85,24,63,45,17,31,96,50.

(b) What do you mean by quick sort? Apply quick sort on the following list:
85,24,63,45,17,31,96,50.

(c) What do you mean by Hash Table? Explain implementation of Hash Table with the help of suitable example.

Q:-5 Attempt any 2 questions **10X2**

(a) Find the binary tree for the following epression: $E= (4*x-6y)*(5*a+3*b)^2$

(b) Write pseudo code for heap sort. Analyze its running time. Perform heap sort on following list of integers.
21,1,34,28,6,85,23,17,22,80,11,2,7,25.

(c) Write short notes on any THREE:
i) Indexing
ii) Hashing
iii) Spanning tree
iv) BFS Vs DFS