

1128
B. E. (Computer Science and Engineering)
Third Semester
CS-301: Data Structures

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting two questions from each Section B-C.

x-x-x

SECTION -A

Q1)

- Give differences in AVL and B trees.
- Compare B tree based and Hash indexing.
- Which is best data structure to store records in memory?
- Give structure of two way circular header linked list.
- Give memory representation for deque.

(5x2=10 marks)

SECTION -B

- Q2) a) Write functions to implement recursive version of Preorder traversal of binary tree. (6 marks)
b) Draw a binary tree for the following algebraic expression:
 $[a + (b - c)] * [(d - e) / (f + s - h)]$ (4 marks)
Write pre order and post order traversals of the binary tree (by using example of constructed binary tree for the above expression).

- Q3) a) What is Big O notation? What is its significance? (3 marks)
b) Apply merge sort on given series and specify its complexity.
44,33,11,55,77,90,40,60,99,22,88,66 (7 marks)

- Q4) a) Write an algorithm which reverses the order of elements of stack using one dimensional stack and some additional variables. (5 marks)
b) Write algorithm for insertion in priority queue. (5 marks)

SECTION- C

- Q5) a) Give polish notation representation of the following expressions?
(i) $(a * (b + a)) + (b / d) * a + z$
(ii) $(a + (b + c * (d + e))) + f$ (4 marks)
b) Explain various operation possible on a doubly link list with algorithm. (6 marks)

- Q6) Write short note on any Two: (10 marks)
(i) Insertion and Deletion in B-trees.
(ii) Huffman's Algorithm
(iii) Collision resolution techniques for hashing.

- Q7) a) What is breadth first search? Write an algorithm with the help of a suitable example for breadth first search. (5marks)
b) Describe an algorithm to find the minimum spanning tree T of weighted Graph G. (5marks)

x-x-x