Aliah University

End Semester Examination(Autumn Semester) 2021

(For 2nd Year 3rd Semester B.Tech)

Paper Name: Data Structures and Algorithms **Full Marks:80**

Paper Code:CSEUGPC01 **Time:3 hours**

Group A

(Answer all questions) **5X2=10**

1. Why is queue data structure called FIFO?
2.What is ADT?
3. Which data structure is used to perform recursion? Why?
4. Define binary tree.
5.Arrange the given array using bubble sort {12,4,5,10,1}.

Group B

(Answer any 5 questions) **6X5=30**

1.Formulate an algorithm to search a node in a binary search tree.
2.Write an algorithm to search a particular data in a single linked list.
3. Convert the following infix expression to postfix expression using stack:

(A+ B) * C- (D - E) / (F + G)

4. Write the binary search algorithm and give its time complexity.
5. Define recursion.Write a recursive function to reverse a string.
6. Differentiate Single linked list and doubly linked list. State the advantages of doubly linked list over single linked list.

Group C

(Answer any 4 questions) **(4X10=40)**

1. Suppose the following eight numbers are inserted in order into an empty binary search tree T : 50, 33, 44, 22, 77, 35, 60, 40.

i) Draw the tree T.
ii) Write the inorder, preorder and postorder traversals for the tree T.
iii) Delete 33 from the tree. Show the resulting tree.
iii) Write the algorithm for inorder traversal of a tree. (2+3+2+3)

2.What are the drawbacks of using sequential storage to represent stacks? Describe the linked representation of stacks. Write an algorithm for PUSH operation on stack using linked list. (3+4+4)

3. Write algorithms for inserting a node in a doubly linked list and deleting a node from a doubly linked list. Consider all cases. (5+5)

4. i) Write algorithms for inserting an element into a queue and deleting an element from a queue. What is a Circular queue? (4+4+2)

5.Write short notes on: (5+5)

i)AVL Tree
ii)Circular Doubly linked list