Reg. No. :

Question Paper Code: 53802

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Information Technology

19UIT302 - DATA STRUCTURES AND ALGORITHMS

(Regulation 2019)

Duration: One hour   Maximum: 30 Marks

Answer ALL Questions

PART A - (5 x 6 = 30 Marks)

1. (a) Write an algorithm for the following operations with   App   (6)
         diagrammatic illustrations using singly linked list

         (i) insertmiddle()

         (ii) deletemiddle()

Or

    (b) Write an algorithm for the following operations with   App   (6)
         diagrammatic illustrations using singly linked list

         (i) insertlast()

         (ii) deletelast()

2. (a) Develop an algorithm and diagrammatic illustrations the push and   App   (6)
         pop operations that can be performed on a Stack using Array
         based implementation

Or

    (b) Develop an algorithm and diagrammatic illustrations the push and   App   (6)
         pop operations that can be performed on a Linked Stack
         implementation

13. (a) Draw a binary search tree with the input given below.   App   (6)
45, 56, 78, 54, 39, 67, 12, 34, 89, 32, 81, 10.
Consider the above drawn binary search tree do the following operations
    (a) Find in-order, Pre-order, Post-order traversal
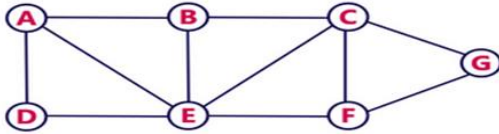   (b) Show the deletion of root node.

Or

(b) Draw a Red Black tree with the input given below.   App   (6))
45, 56, 78, 54, 39, 67, 12,.
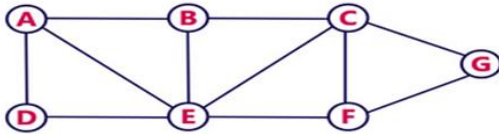Consider the above drawn tree do the following operations
    (a) Find in-order, Pre-order, Post-order traversal
    (b) Insert 11

14. (a) Design and apply BFS based algorithm for checking if a graph is cyclic or not.   App   (6)

Or

(b) Design and apply DFS based algorithm for checking if a graph is cyclic or not.   App   (6)

15. (a) Perform searching of an array of numbers using binary search algorithm and show how to perform searching for the input **7, 9, 23, 54, 82, 101, 112, 125 and 131** if you are searching for the element 9.   App   (6)

Or

(b) Perform searching of an array of numbers using sequential search algorithm and show how to perform searching for the input **7, 9, 23, 54, 82, 101, 112, 125 and 131** if you are searching for the element 125.   App   (6)

53802