Total No. of Questions : 8]

SEAT No. :

**PC2805**

**[6352]-29**

[Total No. of Pages : 3

# S.E. (Electronics/Electronics & Telecommunication)

## DATA STRUCTURES

## (2019 Pattern) (Semester - III) (204184)

*Time : 2½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of calculator is allowed.***
5) ***Assume suitable data if necessary.***

***Q1)*** a) Compare Stack and Queue. What are the advantages of circular queue over liner queue? **[6]**

b) Write a function PUSH and POP in 'C' for stack using linked list. **[6]**

c) What are the applications of Queue? Explain two applications in detail. **[5]**

OR

***Q2)*** a) Write a short note on circular queue. Compare it with linear queue. **[5]**

b) Convert the following prefix expression into infix form. Show all the steps and stack contents: **[6]**

*-A/BC-/AKL

c) Write ADD and DETETE function in 'C' for Queue using array. **[6]**

***Q3)*** a) Compare array and linked list. **[5]**

b) Write a 'C' function to delete a number from singly linked list. **[6]**

c) Explain doubly linked list (DLL). What are the advantages of DLL over SLL. **[6]**

OR

***P.T.O.***

***Q4)*** a) Draw and explain circular linked list. State the limitations of single linked list. **[5]**

b) Write a 'C' function to insert a number at end in to the singly linked list. **[6]**

c) Differentiate singly linked list and doubly linked list. **[6]**

***Q5)*** a) Construct Binary search tree for the following : **[6]**

MAR, OCT, JAN, APR, NOV, FEB, MAY, DEC, JUN, AUG, JUL, SEP

b) Write a pseudo code to search an element in binary search tree using arrays. **[6]**

c) Explain with suitable example how binary tree can be represented using: **[6]**

i) Array

ii) Linked List

OR

***Q6)*** a) Define BST? Create a BST for the following data: **[6]**

14, 15, 4, 9, 7, 18, 3, 5, 7.

b) Define binary tree. Name and explain with suitable example the following terms **[6]**

i) Root node

ii) Left sub tree and right sub tree

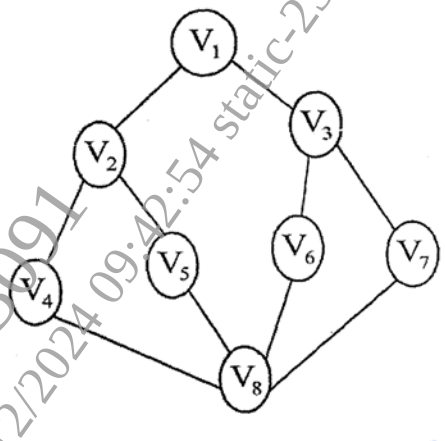
iii) Depth of tree

c) Construct the binary search tree from the following elements: **[6]**

15, 4, 16, 8, 2, 18, 14

Also show preorder, inorder and postorder traversal for the same.

***Q7)*** a) Draw adjacency list and adjacency matrix for the following graph: **[6]**

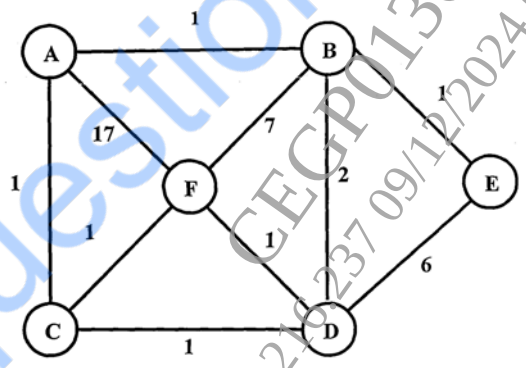



b) What is MST? Explain with suitable example Kruskal's Algorithm to find out MST. **[6]**

c) Define DFS and BFS graph with example. **[6]**

OR

***Q8)*** a) Explain Kruskal algorithm? Find the minimum spanning tree for below figure. Using Kruskal's Algorithm. **[6]**




b) Explain Dijkstra's algorithm with example. **[6]**

c) Explain with suitable example the techniques to represent a Graph. **[6]**

Note: consider graph of minimum 6 vertices