Total No. of Questions : 8]

SEAT No. :

PE-5969

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S.E. (Electronics/ET&C/Electronics (VLSI Design & Tech.)/E.C (A.C.T.))

DATA STRUCTURES

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

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable additional data if necessary.***
5) ***Use of Calculator is allowed.***

Q1) 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]**

OR

Q2) 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]**

Q3) 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]**

OR

Q4) 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]**

P.T.O.

Q5) 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.

OR

Q6) a) Construct Binary search tree for the following : **[6]**

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

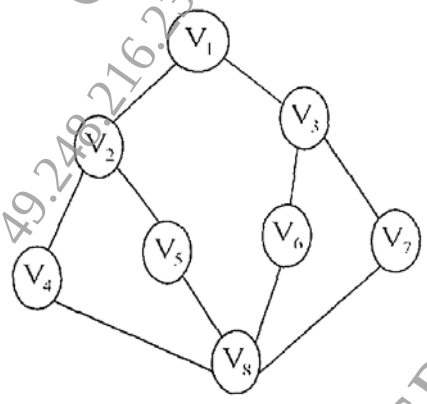
b) Write a pseudo code to search an element in binary search tree using arrays. **[6]**

c) Explain with suitable example how binary tree can be represented using:

i) Array

ii) Linked List **[6]**

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

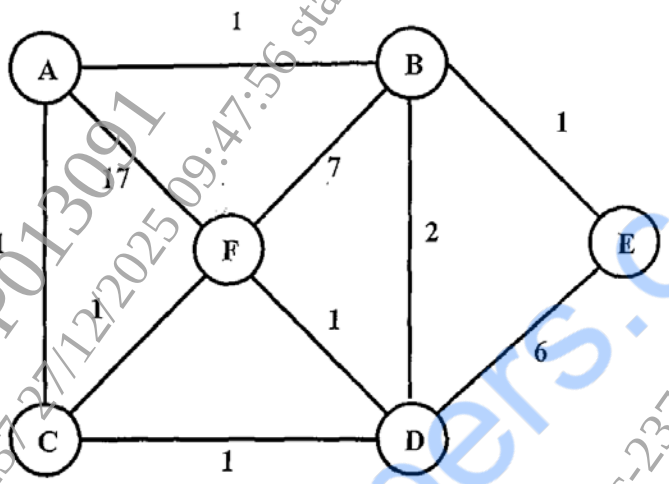


b) What is MST? Explain with suitable example Kruskal's Algorithm to find out. MST **[6]**

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 5 vertices

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