Total No. of Questions : 8]

SEAT No. : [ ]

PB3624

[Total No. of Pages :3

[6261]-29
S.E. (E & TC)
DATA STRUCTURES AND ALGORITHMS
(2019 Pattern) (Semester-III) (204184)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer 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 wherever necessary.***
3) ***Figures to the right indicates full marks.***
4) ***Use of Calculator is followed.***
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 'C' function to insert a number at end in to the single linked list. **[6]**

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

Q5) a) Construct Binary search tree of 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

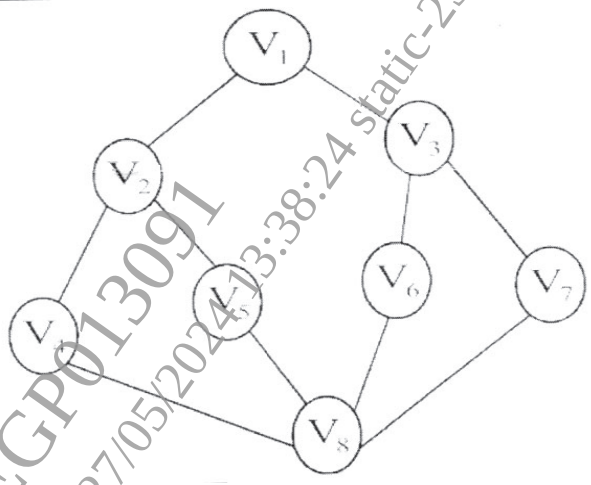
iii) Depth of tree

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]**

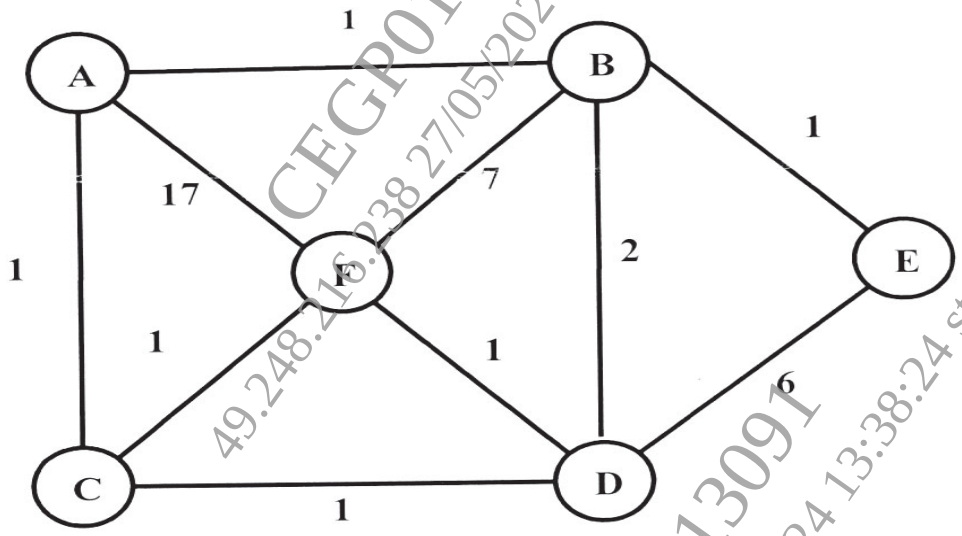


b) What is MST? Explain with suitable example Kruskal's Algorithm to find out MST. **[6]**

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