Total No. of Questions : 5]

SEAT No. :

PA-1017

[Total No. of Pages :2

[5902]-41

S.Y. B.Sc. (Computer Science)

CS-241 : DATA STRUCTURES & ALGORITHMS - I

(CBCS) (2019 Pattern) (Semester - IV)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates :

1) *Neat diagrams must be drawn wherever necessary.*
2) *Figures to the right indicate full marks.*

Q1) Attempt any Eight of the following: **[8 × 1 = 8]**

a) Define degree of a tree.

b) Define the term left skewed binary tree.

c) What is height balance tree?

d) List 2 applications of graph.

e) What is topological sorting?

f) Define Bucket.

g) What is collision?

h) Define complete Binary tree.

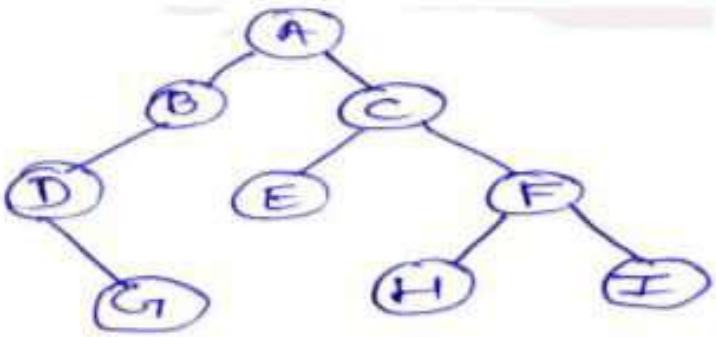
i) What is weighted graph?

j) Explain open addressing concept in hash table.

Q2) Attempt any four of the following: **[4 × 2 = 8]**

a) Traverse the following binary tree using given traversal technique

i) Inorder ii) Postorder.



P.T.O.

b) Compare B tree & B+ tree.

c) Define indegree & outdegree of vertex with example.

d) Explain the concept of hushing & rehashing in Hash table.

e) Explain concept of Red - Black Tree.

Q3) Attempt any two: **[2 × 4 = 8]**

a) Write C program to represent graph as adjacency matrix.

b) Write C Program to compare two BST.

c) Write a program to find minimum value node from the BST.

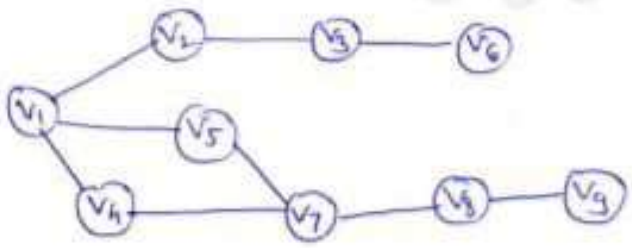
Q4) Attempt any two: **[2 × 4 = 8]**

a) Write a program to insert an element into binary tree.

b) Construct AVL tree for the following:

{Mon, Sun, Thur, Fri, Sat, Wed, Tue}

c) Consider the following graph.



Give i) DFS Traversal

ii) BFS Traversal.

Q5) Attempt any one of the following: **[1 × 3 = 3]**

a) Write note on quadratic probing

b) Compare the data structures.

Tree & Graph.

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Total No. of Questions : 5]

SEAT No. :

P5143

[Total No. of Pages : 3

[5823]-401

S.Y.B.Sc.

COMPUTER SCIENCE

CS 241 : Data Structure and Algorithms - II

(2019 CBCS Pattern) (Semester - IV)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Figures to the write indicate full marks.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Your answers will be values as a whole.***

Q1) Attempt any EIGHT of the following. **[8 × 1 = 8]**

a) Define Heap.

b) List tree traversal methods.

c) Define node of tree.

d) What is height balance tree?

e) Define balance factor.

f) Define Spanning tree.

g) Define in-degree & out-degree of vertex.

h) What is weighted graph.

i) Define Bucket

j) What do you mean by rehashing.

Q2) Attempt any Four of the following. **[4 × 2 = 8]**

a) Write any two properties of hash function.

b) Define i) Degree of vertex

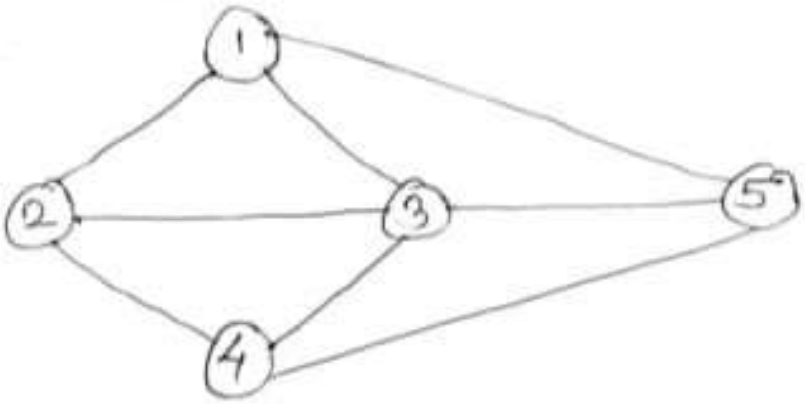
ii) Subgraph

c) List any two applications of tree data structure.

d) What is skewed binary tree.

P.T.O.

e) Convert the following undirected graph into adjacency matrix.



Q3) Attempt any Two of the following. **[2 × 4 = 8]**

a) Write a program to sort 'n' randomly generated elements using heapsort method.

b) Write a program that accepts the vertices and edges of graph and store it as an adjacency matrix. Display adjacency matrix.

c) Write a function to search an element in binary search tree.

Q4) Attempt any Two of the following. **[2 × 4 = 8]**

a) Construct an AVL tree for the following data.

70, 50, 30, 90, 80, 130, 120

b) Consider the following adjacency matrix.

	1	2	3	4
1	0	1	1	0
2	1	0	1	0
3	0	0	0	1
4	1	0	0	0

i) Draw the graph

ii) Draw Adjacency list.

c) Write a C function to traverse a graph using BFS.

Q5) Attempt any ONE of the following. **[1 × 3 = 3]**

a) Define the following terms.

i) Height of tree

ii) Forest

iii) Siblings of tree

b) Traverse the following tree using preorder, inorder and postorder traversal techniques.