Total No. of Questions : 5]

SEAT No. :

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

CS 241 : DATA STRUCTURES AND ALGORITHMS - II

(Revised 2019) (Semester - IV) (24121)

Time : 2 Hours] *[Max. Marks : 3*

Instructions to the candidates:

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

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

a) "Binary tree contains every node with minimum two child nodes". State true/false.

b) Define : left skewed binary tree.

c) What is degree of a graph?

d) Name datastructure used to implement depth first search (DFS) of a graph.

e) What is complete binary tree?

f) Define : balance factor.

g) Write properties of a good hash function.

h) Write any two applications of graph.

i) "Complete graph contains n(n–1)/2 number of edges". State true/false.

j) What is synonym of Hashing?

P.T.O.

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

a) What is splay tree?

b) Explain Mid = Square function in hashing with suitable example.

c) What is inverse adjacency list?

d) Show the steps of creating a binary search tree for the following data 15, 30, 20, 5, 10, 2, 7

e) Consider the following adjacency matrix Draw the graph from it.

	v_1	v_2	v_3	v_4	v_5
v_1	0	1	1	1	1
v_2	0	0	1	0	0
v_3	0	0	0	1	1
v_4	0	0	1	0	1
v_5	0	0	0	0	0

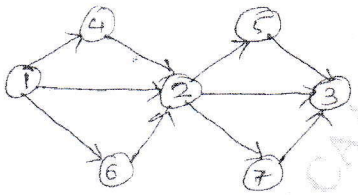
Q3) Attempt any two of the following. [2×4=8]

a) Construct red black tree for the following.

50, 40, 30, 20, 10, 35, 5

b) Write a recursive function in 'c' to display and count leaf nodes of a binary search tree.

c) Consider the following graph:



i) Draw Adjacency List

ii) Write BFS and DFS traversal

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

a) Write a 'c' function to insert a node in binary search tree.

b) Construt AVL tree for the following data :

XYZ, PQR, LMN, QBC, ABC, STR, UVW, BMC.

c) Store following values in Hash table:

13, 45, 24, 113, 161, 207, 211.

Use division method of hashing with table size 11. Number of slots is 1 in each bucket. Apply linear probing to resolve over flow. Show hash table contents.

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

a) Differentiate between B and B+ tree.

b) What will be the topological order of activities for the AOV network given below?