March 2022

M.Tech (CSE) 1st Sem

Advance Data Structure (MCS-18-102)

Time: 90 Minutes   Max. Marks:25

Instructions: 1. *It is compulsory to answer all the questions (1 marks each) of Part -A in short.*

2. *Answer any three questions from Part -B in detail.*

3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART –A

Q1 (a) Define Binary Search Tree?   (1)

(b) What is the need of Randomization in Computing?   (1)

(c) What is the complexity of searching an element while using hashing?   (1)

(d) In the dictionary data structure, how is the data accessed?   (1)

(e) Differentiate between skip list and link list data structure.   (1)

(f) What is the meaning of RED and BLACK nodes of the Red Black tree?   (1)

(g) Differentiate   between   divide-conquer   and   dynamic   programming   (1)
methodology?

(h) Differentiate between priority search tree and binary search tree.   (1)

(i) List the various operations which can be performed on given two strings other   (1)
than the concatenation operation?

(j) What will be height of AVL tree in best, average and worst case?   (1)

PART –B

Q2 (a) In the given skip list of following elements- 10, 20, 30, 35, 45, 56, 76, 88, 99,   (3)
106 with express line pointing to 1st , 5th and last element of the list. Explain
the steps to search a key element equal to 87.

(b) In the following dictionary-   (2)
{'Detra':17,'Nova':84,'Charlie':22,'Henry':75,'Roxanne':92,'Elsa' : 29 }. Give
example about how the retrieve, insert, update and delete operations can be
performed?

Q3 (a) Explain all collision resolution techniques in Hashing.   (2)

(b) Write Knuth-Morris-Pratt Algorithm and explain its use with an example.   (3)

Q4   Explain all the rotation which may require in AVL tree with suitable examples.   (5)

Q5 Generate the Huffman codes for the following characters appearing in a data (5) file. Frequency of occurrence of each character is mentioned below.

Character	a	b	c	d	e	f	g	H
Frequency(%)	22	10	17	6	7	3	20	15

Q6 (a) What do you mean by Computation Geometry and how this is related to (2) computer vision field?

(b) Build a binary search tree for the following elements- 13, 45, 23, 67, 76, 22, 11 (3) 33, 23.

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