(or)

9. a. Explain about m-way search trees. **(CO3 K2) 5M**

b. Explain Heap sort algorithm and Sort the following list using Heap Sort66, 33, 40, 20, 50, 88, 60, 11, 77, 30, 45, 65. **(CO4 K4) 10M**

* * *

Reg. No:

VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, DECEMBER - 2023

Third Semester

INFORMATION TECHNOLOGY

20IT3303 DATA STRUCTURES

Time: 3 hours ***Max. Marks: 70***

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. What is data abstraction? **(CO1 K1)**

b. Define stack. **(CO1 K1)**

c. Write the properties of different sorting techniques. **(CO1 K2)**

d. What are the applications of Queue? **(CO2 K2)**

e. List different types of AVL rotations. **(CO3 K2)**

f. Define Binary Search Tree. **(CO3 K1)**

g. Give different types of binary tree. **(CO3 K2)**

h. Illustrate priority queue. **(CO2 K2)**

i. Differentiate between Min Heap and Max heap. **(CO1 K2)**

j. What is rehashing? **(CO1 K1)**

PART-B

4 x 15 = 60M

UNIT-I

2. a. Convert the following infix expression to post fix notation ((a+2)*(b+4)) -1. **(CO2 K3) 7M**

   b. Explain Linear Search with complexity analysis. **(CO1 K2) 8M**

(or)

3. a. Explain the algorithm and Evaluate the given post expression 234+*6- **(CO1 K5) 7M**

   b. Discuss about Merge Sort algorithm with an example. **(CO1 K2) 8M**

UNIT-II

4. a. Discuss various operations on Queue Data Structure. **(CO1 K2) 5M**

   b. Explain the following operation in a Doubly linked list with example.
   i. Create a list adding nodes at the end.
   ii. Delete a node at a given position. **(CO2 K3) 10M**

(or)

5. a. Compare and Contrast the Queue and Circular Queue.**(CO2 K2) 6M**

   b. Write an algorithm to perform addition of two polynomials, and justify with an example. **(CO2 K4) 9M**

UNIT-III

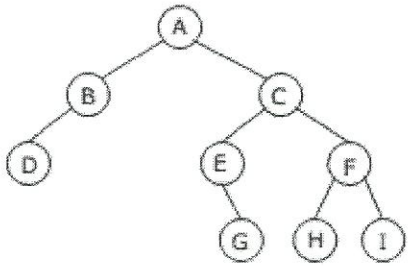
6. a. Construct a BST for the following sequence of numbers 45, 36, 76, 23, 89, 115, 98, 39, 41, 56, 69, 48. **(CO3 K4) 7M**

   b. Construct an AVL tree by inserting the following elements in the given order.63, 9, 19, 27, 18, 108, 99, 81. **(CO3 K3) 8M**

(or)

7. a. Explain about different rotations on AVL tree. **(CO3 K2) 8M**

   b. Write Inorder, Preorder and Postorder Traversal for the given tree. **(CO3 K2) 7M**



UNIT-IV

8. a. Define B-trees? Construct a B-Tree of order 3 for the following set of Input data: 69, 19, 43, 16, 25, 40, 132, 100, 145, 7, 15, 18. **(CO4 K6) 8M**

   b. Explain the process of handling collisions in open addressing technique with an example . **(CO1 K2) 7M**