VR20 Reg. No: | | | | | | | | | | |

VEERAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, March, 2022

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. Define data abstraction.
   b. What is the time complexity of bubble sort algorithm?
   c. List the three types of representation of an expression.
   d. Differentiate between array and linked list.
   e. Define stack.
   f. Draw a binary search tree for the sequence of numbers.
   3, 10, 7, 8, 12, 14
   g. What is lever order traversal?
   h. What is collision in hashing?
   i. Give an example to m-way search tree.
   j. Give an example to Max heap.

PART-B

4 x 15 = 60M

UNIT-I

2. a. Elaborate on the performance and comparison of different sorting techniques. **8M**

   b. Explain binary search with an example. **7M**

(or)

3. a. Explain how to evaluate a postfix expression using stack with an algorithm. **8M**

   b. Explain Quick sort algorithm with an example. **7M**

UNIT-II

4. a. Discuss about operations on circular queue data structure. **7M**

   b. Explain the following operation in a singly linked list with example
   i) Create a list adding nodes at the front.
   ii) Delete a node at a given position. **8M**

(or)

5. a. Explain how a polynomial expression can be represented using linked list. **8M**

   b. Discuss the applications of queue data structure. **7M**

UNIT-III

6. a. Construct binary tree and identify pre-order from given inorder and postorder traversals: **7M**
   i) In-order: D B E A F C
   ii) Post-order: D E B F C A.

   b. Construct AVL tree for the following sequence of numbers **8M**
   50 , 20 , 60 , 10 , 8 , 15 , 32 , 46 , 11 , 48.

(or)

7. a. Define BST? Explain with suitable algorithm for inserting a node at different instances. Illustrate with suitable example. **8M**

   b. Discuss briefly about various AVL tree rotations. **7M**

UNIT-IV

8. a. Show the result of inserting the keys.
   F, S, Q, K, C, L, H, T, V, W, M, R, N , P, A, B, X, Y, D, Z, E
   into B-tree of order 3. **9M**

   b. Illustrate how extendable resolve collision in hashing. **6M**

(or)

9. a. Explain the functionality of Max Heap. **6M**

   b. Explain separate chaining collision handling method with a hash function of K mod N and sequence of keys as 50, 700, 76, 85, 92, 73, 101
   Here K is the key and N is the number of keys. **9M**

* * *