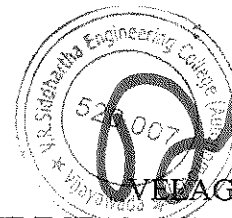


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VEERAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

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 level order traversal?
 - h. What is collision in hashing?
 - i. Give an example to m-way search tree.
 - j. Give an example to Max heap.



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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**

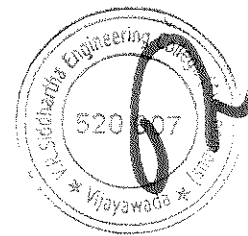
UNIT-II

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**

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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 $K \bmod N$ 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**

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