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VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, MARCH, 2021

Third Semester

INFORMATION TECHNOLOGY

17IT3303 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. Differentiate between linear and binary search.
 - b. What is data abstraction?
 - c. What is linked list? Write the advantage of doubly linked list over singly linked list.
 - d. List the applications of Queue.
 - e. Define Binary search tree.
 - f. List any two properties of B-Tree.
 - g. What is Graph?
 - h. Define Hashing.
 - i. Define B-tree.
 - j. Define height and depth of a binary tree.

PART-B**4 x 15 = 60M****UNIT-I**

2. a. Discuss time complexity for evaluating performance of an algorithm. **7M**
- b. Explain the procedure to evaluate postfix expression. Evaluate the following postfix expression $7\ 3\ 4\ +\ -\ 2\ 4\ 5\ /\ +\ * \ 6\ /\ 7\ +\ ?$ **8M**
- (or)
3. a. Define data structure. Discuss different types of data structures. **6M**
- b. Explain binary search with example. Also, write a program to search an element using binary search. **9M**

UNIT-II

4. a. Explain how linked list can be used for representing polynomials using a suitable example? **8M**
- b. Explain about insertion and deletion operations on single linked lists. Write pseudo code for the same. **7M**
- (or)
5. a. Write an algorithm to delete an element anywhere from doubly linked list? **7M**

- b. Define and explain about Circular Queue. **8M**

UNIT-III

6. a. Explain in brief about AVL Trees. **8M**
- b. Explain about m-way search trees. **7M**
- (or)
7. a. What is a binary tree? Construct a binary tree given the pre-order traversal and inorder traversals as follows:
Pre-Order Traversal: G B Q A C K F P D E R H
In-Order Traversal: Q B K C F A G P E D H R **8M**
- b. Explain the procedure to insert and delete elements in B-Trees. **7M**

UNIT-IV

8. a. Illustrate quick sort technique, with an example. **7M**
- b. What is Hash function? Explain about Extendable hashing. **8M**
- (or)
9. a. Write C program for insertion sort technique. **8M**
- b. Explain various representations of graph. **7M**

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