

**14CS3303**

(or)

9. a. Write an algorithm for bubble sort. Consider the following elements and perform the bubble sort  
7, 8, 26, 44, 13, 23, 57, 98 **8M**
- b. Discuss Linear Probe concept in collision resolution. **7M**

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**VR14**

Reg. No: 

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**SIDDHARTHA ENGINEERING COLLEGE**

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, OCTOBER, 2019

Third Semester

**COMPUTER SCIENCE AND ENGINEERING**

**14CS3303 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. List any two essential criteria of an algorithm.  
b. Write the postfix form of  $(A+B)*D+E$ .  
c. What is the use of stack top?  
d. Mention two drawbacks of singly linked list.  
e. What are the properties of a tree data structure?  
f. List the properties of binary search tree.  
g. How will you calculate the degree of node?  
h. Define binary search.  
i. Compared merge sort.  
j. What is Hashing?

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

2. a. Consider the following expressions and convert postfix into infix and explain each **8M**
- i)  $A B - C + D E F - + \$$
- ii)  $A B C D E - + \$ * E F * -$
- b. Using recursive procedure **7M**
- i) Write a C routine for Fibonacci sequence.
- ii) Compare it with iterative procedure and explain which is best.

**(or)**

3. a. Write a C routine to insert and delete an element from Circular Queue and explain each with an example. **8M**
- b. Write a C routine to transform prefix into postfix. Carefully state any assumption you make regarding the input. How much time and space does your routine take? **7M**

**UNIT-II**

4. a. Write a C routine to add and remove an element from the linked stack and explain it with an example. **9M**
- b. Compare and contrast the efficiencies of doubly linked list and singly linked list. Also, mention which is less efficient? **6M**

**(or)**

5. a. Write an algorithm to insert and delete a node from doubly linked list. **8M**
- b. Explain the concept of circular linked list with needed pseudocodes. **7M**

**UNIT-III**

6. a. Write a C routine of inserting a node of binary search tree and explain it with an example. **8M**
- b. Construct a binary tree for the following expression and explain  $(A + B * C) \$ ((A + B) * C)$  **7M**

**(or)**

7. a. Explain the linked list representation of binary trees with diagrams. **8M**
- b. Write a C routine to traverse a binary tree in in-order, pre-order and post-order. **7M**

**UNIT-IV**

8. a. What is Hash function? Explain any three Hash functions with relevant examples. **8M**
- b. Write a C routine of sequential search and demonstrate with an example. **7M**