Subject Code: 20CS304PC | SET-I | HT NO: 2 1 7 R 1 A 6 6 5 5

CMR TECHNICAL CAMPUS
UGC AUTONOMOUS
B. Tech. III Semester Regular/Supply End Examinations, Feb-2023
Data Structures using C
Common to CSE, IT, CSM, CSD, CSG, AIML

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

Note

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

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PART-A

10 X 02 = 20 Marks

			Marks	CO	BL
1.	a	Define abstract data type.	2	CO1	L1
	b	Write a pseudocode for checking stack is empty.	2	CO1	L2
	c	List out the operations performed in dictionary with example.	2	CO2	L2
	d	Define hash function.	2	CO2	L1
	e	Differentiate between Binary tree and binary search tree.	2	CO3	L3
	f	List out the applications of Red-Black tree.	2	CO3	L2
	g	What are the applications of graph?	2	CO4	L2
	h	What is the time complexity of merge sort?	2	CO4	L3
	i	List out the algorithms used for pattern matching.	2	CO5	L2
	j	Write short notes on suffix tries.	2	CO5	L2

PART- B

5 X 10 = 50 Marks

			Marks	CO	BL
2.	a	Write a procedure to do different types of insertion and deletion elements from singly linked list.	10	CO1	L3
		OR			
3	a	Define Queue ADT. Write an algorithm for different operations performed on Queue using array.	6	CO1	L3
	b	Convert the following infix expression into postfix notations: a+b*c/d–f+g	4	CO1	L4
4	a	Write the Program to implement the following operations on binary search tree: Perform insert and delete operations on binary search tree	10	CO2	L3
		OR			

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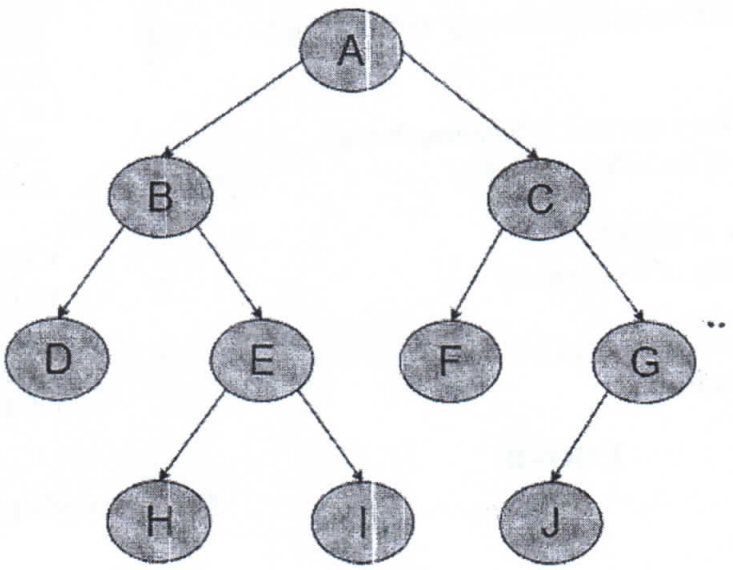
5	a	Define collision in hashing. Explain collision resolution techniques in context of hashing with example.	10	CO2	L3
6		Write an algorithm to AVL tree insertion. Insert the following elements in an empty tree and balance the tree after each insertion: Data: 3, 6, 5, 8, 19, 10, 2, 17,13,11,1,4	10	CO3	L4
		OR			
7	a	Explain in detail about splay tree with its properties, types with suitable examples.	7	CO3	L3
	b	Explain the acceptable balancing factor of AVL tree.	3	CO3	L2
8	a	Perform merge sort algorithm on the following values: 58, 8, 21, 64, 98, 34, 28, 13, 45, 59, 68	5	CO4	L4
	b	Write an algorithm for heap sort.	5	CO4	L3
		OR			
9	a	Explain in detail about BFS and DFS algorithm. Apply the same to the following graph:	10	CO4	L4



10	a	Explain in detail about the Brute-Force and Bayer Moore Pattern Maching algorithms with proper examples.	10	CO5	L3
		OR			
11	a	Explain in detail about the Knuth-Morris-Pratt algorithm with an example.	10	CO5	L3

CO : Course Outcomes

BL : Bloom's Taxonomy Levels **L 1 : Remembering** **L 2 : Understanding**

L 3 : Applying **L 4 : Analysing**

L 5 : Evaluating **L 6 : Creating**

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CMR TECHNICAL CAMPUS
UGC AUTONOMOUS
B.Tech - III Semester, Regular End Examinations, Feb-2022
Data Structures using C [20CS302PC]
(Common to CSE, IT, CSD & CSM)

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

Answer Any Five Questions
All Questions Carry Equal Marks

5X 14 = 70 Marks

1. a. Explain linked list implementation of queues. [7M]
   b. Distinguish between stack and queue. [7M]

2. a. Explain Stack ADT and its operations. [7M]
   b. Write an algorithm to convert infix expression to postfix expression. [7M]

3. a. Explain Rehashing in detail. [7M]
   b. Demonstrate skip list operations. [7M]

4. a. Explain linear probing with an example. [7M]
   b. Write short notes on separate chaining. [7M]

5. a. How to construct AVL tree.Explain with an example? [7M]
   b. What are the properties of red-black tree? [7M]

6. a. What are the advantages of binary search tree? [5M]
   b. Explain splay trees with an example? [9M]

7. a. Write an algorithm to sort elements using Heap sort technique? [7M]
   b. Demonstrate DFS using suitable example? [7M]

8. a. How does the Boyer-Moore algorithm work? [7M]
   b. What are the different types of tries? [7M]

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CMR TECHNICAL CAMPUS
UGC AUTONOMOUS
B.Tech - III Semester, Supply Examinations, July-2022
Data Structures using C[20CS302PC]
(Common to CSE, CSD, CSM & IT)

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

Answer Any Five Questions
All Questions Carry Equal Marks

5 X 14 = 70 Marks

1. a. Explain various operations that are performed on queue with suitable algorithms. **[7M]**
   b. Explain stack ADT operations with suitable example. **[7M]**

2. a. Explain the Infix to postfix conversion using stack ADT. **[7M]**
   b. Write an algorithm to insert new node at the beginning, at middle position and at the end of a Singly Linked List. **[7M]**

3. Explain how data is inserted and deleted from dictionaries while it is implemented using list data structure. **[14M]**

4. The keys 12,18,13,2,3,23,5,and 15 are inserted into an initially empty hash table of length 10 using linear probing with hash function h(k)= k mod 10. What is the resultant hash table? **[14M]**

5. a. Show the result of inserting 3 , 1 , 4 , 6 , 9 , 2 , 5 , 7 into an initially empty AVL tree? **[7M]**
   b. Show the result after each insertion of AVL Tree and also show the result after deletion of the root? **[7M]**

6. What are the properties that are satisfied by red- black tree? Explain LLr, LRr,RRr, RLr rotations. **[14M]**

7. a. Explain about the DFS with example. **[7M]**
   b. Explain merge sort with an example. **[7M]**

8. a. Explain about the KMP pattern matching algorithm. Illustrate the operations of KMP pattern matching algorithm with example. **[7M]**
   b. Discuss standard Tries and Compressed Tries. **[7M]**

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