Reg No.:_____ Name:_____

0520RLMCA105122006

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

First Semester MCA (2 Year) Degree Examination December 2021

Course Code: 20MCA105

Course Name: ADVANCED DATA STRUCTURES

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. **Marks**

1	Distinguish between linear data structure and non-linear data structure	(3)
2	Explain any two collision resolution methods in Hashing	(3)
3	Explain the characteristics of Balanced Binary Search Tree	(3)
4	What is a Splay Tree? What are the advantages of Splay trees?	(3)
5	A binomial heap has four binomial trees. Their degrees are 0,1,2 and 4. After you add an entry how many binomial trees will the heap have? What are the degrees of the trees?	(3)
6	Explain the characteristics of Fibonacci Heap	(3)
7	Compare and Contrast Breadth First Search and Depth First Search	(3)
8	What is topological sort in a graph?	(3)
9	What is smart contract?	(3)
10	Explain Transaction model in Block Chain Technology.	(3)

PART B

Answer any one question from each module. Each question carries 6 marks.

Module I

11	How do you perform Amortized analysis using Aggregate method? Illustrate with the example of Incrementing Binary Counter	(6)

OR

12	Explain Disjoint Set Data structure. What are the operations performed on Disjoint Set Data structure	(6)

Module II

13	Construct a red-black tree by inserting the keys in the following sequence into an initially empty red-black tree: 13, 10, 8, 3, 4 and 9. Show each step	(6)

OR

14		Describe BTree. How can we insert a key into a BTree?	(6)
		Module III	
15	a)	Draw a binomial heap whose keys are 6,3,5,18,1,10,7,9,16,10,20	(6)
	b)	Explain how union operation is performed in a Binomial heap	
		OR	
16		Describe the Extract Min Operation in Fibonacci Heap with the help of an example. What is the amortized cost of the operation?	(6)
		Module IV	
17		What is a Minimum Spanning tree? Explain Kruskal's algorithm to find Minimum Spanning tree with an example	(6)
		OR	
18		Explain Strongly Connected Components. How can you find Strongly connected components of a graph?	(6)
		Module V	
19		Describe Block Chain Architecture.	(6)
		OR	
20		Explain Data Structure and Data types in Block Chain Technology	(6)

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