Reg No.:	Name:

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

First Semester MCA (Two Year) Degree Regular and Supplementary Examination December/January 2022-23

Course Code: 20MCA105

Course Name: ADVANCED DATA STRUCTURES

Max. Marks: 60 **Duration: 3 Hours** PART A Marks Answer all questions, each carries3 marks. 1 Differentiate between Stack and Queue. (3) 2 What is Set data structure? How is a Set implemented using Bit String? (3) 3 State the properties of a Red Black tree. (3) 4 What is meant by Splay Tree? (3) 5 List out any three operations supported by a Mergeable Heap. (3) 6 Find the Potential of the Fibonacci Heap given below. (3) 7 What is meant by Bi-Connected Components? Illustrate with an example. (3) Write any one of the Topological Ordering of the graph. 8 (3) 9 Explain block chaining with an example. (3) 10 What is Merkle tree? Give example. (3) **PART B** Answer any one question from each module. Each question carries 6 marks. Module I 11 How do you perform Amortised Analysis using Accounting method? Illustrate (6) with Incrementing Binary Counter example.

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OR

What are the different collision resolution techniques in hashing? Explain any (6) one of them.

Module II

Explain different cases of inserting nodes into a Red-Black Tree with an (6) illustration.

OR

How a full node is splitted in B Tree Insertion procedure? Explain with a (6) diagram.

Module III

Explain how the Decrease-Key operation is performed on Binomial Heaps. What (6) is the Amortised Cost of this operation?

OR

Describe how Extract-Min operation is performed in a Fibonacci Heap? Illustrate (6) with an example.

Module IV

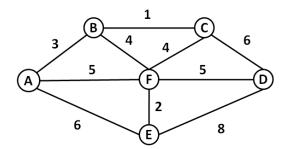
Explain Depth First Search algorithm with a suitable example.

OR

(6)

(6)

Apply Kruskal's algorithm to find a minimum spanning tree of the following (6) graph.



Module V

19 Explain Blockchain Architecture in detail.

OR

Describe the data types in Blockchain. (6)
