Reg No.:_____ Name:_____

0520MCA105122004

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

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

Course Code: 20MCA105

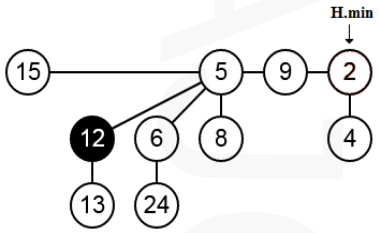
Course Name: ADVANCED DATA STRUCTURES

Max. Marks: 60 Duration: 3 Hours

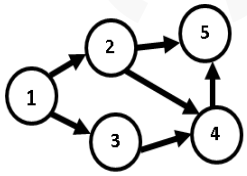
PART A

Answer all questions, each carries3 marks. 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)
8	Write any one of the Topological Ordering of the graph.	(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 with Incrementing Binary Counter example.	(6)

OR

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

Module II

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

OR

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

Module III

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

OR

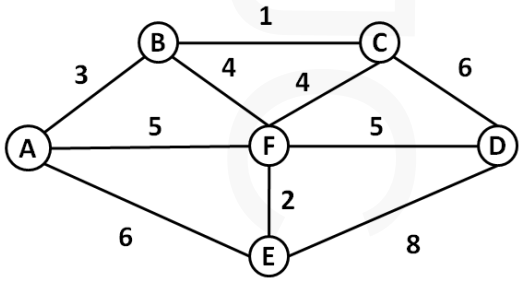
16 Describe how Extract-Min operation is performed in a Fibonacci Heap? Illustrate with an example. (6)

Module IV

17 Explain Depth First Search algorithm with a suitable example. (6)

OR

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



Module V

19 Explain Blockchain Architecture in detail. (6)

OR

20 Describe the data types in Blockchain. (6)

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