SCHOOL OF COMPUTER ENGINEERING
I SEMESTER M. TECH (CSE/CSIS)
MIDTERM EXAMINATION, SEPTEMBER 2025
SUBJECT: ADVANCED DATA STRUCTURES AND ALGORITHMS (CSS5101)

Time: 90 minutes   Date: 13/09/25   MAX.MARKS: 30

Note: Answer ALL the questions

Q.No	Questions	Marks
1	Write an algorithm which adds 1 to k-bit binary number and apply the algorithm to prove that O (1) is the amortized cost for n increment operations, which adds1 to the k-bit binary number present in the binary counter.	5
2	Illustrate the potential method to find the amortized cost with the help of example.	5
3	Construct the B-Tree with degree 3 with following keys in order of their arrival 7, 2, 15, 18, 9, 100, 150, 17, 1, 11, 120, 20, 95, 35, 92, 93, 12, 300, 135, 210, 8, 5, 111, 112, 155, 118, 350.	5
4	Analyze and explain the steps to be followed to delete any key in B-tree. Delete in order the keys in the B-tree with minimum degree3 given in Fig. (i) R (ii) X (iii) M	5

F   M   y

| 5 | List all the properties of the Binomial tree and also construct a Binomial heap with 28 nodes assuming suitable data. | 5 |
| 6 | Design an algorithm to search for a minimum in a Binomial heap and find its complexity. | 5 |