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**School of Computing Science and Engineering**

Bachelor of Technology in Computer Science and Engineering

Mid Term Examination - May 2024

Duration : 90 Minutes

Max Marks : 50

**Sem VI - R1UC601B - Advanced Algorithmic Problem Solving***General Instructions**Answer to the specific question asked**Draw neat, labelled diagrams wherever necessary**Approved data hand books are allowed subject to verification by the Invigilator*

- 1) Explain the concept of back tracking. K2 (2)
- 2) Write a function to find the string length. K1 (3)
- 3) What the significance of Big O, Theta, and Omega notations. K2 (4)
- 4) Comprehend the principle of recursion and how functions can call themselves to solve problems. K2 (6)
- 5) Implement a function that uses the sliding window technique to find the maximum sum of any contiguous subarray of size K. K3 (6)
- 6) Write a program to implement stack that supports push, pop, top, and write the time complexity of each operation. K3 (9)
- 7) Examine the efficiency of the sliding window technique versus the two-pointer technique for a given set of array-based problems. What are the trade-offs involved in choosing one method over the other? K4 (8)
- 8) Evaluate the use of recursion and backtracking in solving the subset sum problem. How does the state-space tree representation aid in understanding the problem-solving process? K4 (12)

**OR**

- Critically evaluate the efficiency of backtracking algorithms in solving combinatorial problems like the n-Queens problem. How does the approach compare to iterative solutions? K4 (12)