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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 IV - R1UC404B - Analysis and Design of AlgorithmsGeneral 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) Differentiate between Best, average and worst case complexity. K2 (2)
- 2) Write pseudocode for linear search K1 (3)
- 3) Write a recursive algorithm for computing the nth fibonacci number K2 (4)
- 4) What is the Time Efficiency of Recursive Algorithms and use recurrence to find number of moves for Towers of Hanoi problem size n. $[A(n)=A(n-1) + A(n-2), A(0)=0, A(1)=1]$ K2 (6)
- 5) Differentiate between divide and conquer and brute force problem solving approach. K3 (6)
- 6) (i) Find the number of comparisons required to search for '6' in the given Sequence of numbers: 10, 19, 7, 9, 6, 15. (ii) Analyze the time efficiency and drawbacks of merge sort algorithm. K3 (9)
- 7) Analyze the recursive and non-recursive versions of the factorial function. Find the best and worst case time complexity also i) Examine how much each function requires as 'n' becomes large. ii) Find the time complexity and space complexity K4 (8)
- 8) Work through Binary Search algorithm on an ordered file with the following keys: {1,2,3,4,5,6,7,8,9,10,11,12,13,14,15}. Determine the number of comparisons made while searching for keys 2, 10 and 15. K4 (12)

OR

Analyze the time complexity of Strassen's algorithm compared to conventional matrix multiplication. K4 (12)