Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

**INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATION-MAY 2023
IV SEMESTER B.Sc.(APPLIED SCIENCES) IN ENGG.**

DESIGN AND ANALYSIS OF ALGORITHMS [ICS 243]

Marks: 50   **Duration: 180 mins.**

Answer all the questions.

Missing data if any, may be suitably assumed.

1)	A)	Write an algorithm/ a pseudo code to check the primality of a positive number n. Also, explain how to determine the input size of the number n with the help of Asymptotic notation?	(4)
	B)	Show that the efficiency analysis framework ignores multiplicative constants and concentrates on the count's order of growth to within a constant multiple for large-size inputs.	(4)
	C)	Analyze the time complexity for given recurrence relation using back substitution method $T(n)=2T(n-1)+1$ for $n>0$	(2)
2)	A)	Write the complete pseudocode of quick_sort (sort and partition) and sort the given list in ascending order: 90, 46, 69, 91, 30, 35, 18. Show each pass of the algorithm.	(7)
	B)	Determine the number of character comparisons the brute-force algorithm makes in searching for the pattern GANDHI in the text. THERE_IS_MORE_TWO_LIFE_THAN_INCREASING_ITS_SPEED Count underscore symbol as a character as well.	(3)
3)	A)	Perform DFS Traversal on the following graph. Result should be presented by DFS_visited_list, and DFS_traversal_tree.	(5)