Question Paper

Exam Date & Time: 08-May-2023 (09:30 AM - 12:30 PM)



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 - S2]

Marks: 50

Duration: 180 mins.

Answer all the questions.

Missing data if any, may be suitably assumed.

1)	A)	What is a brute force algorithm? Write an algorithm/ a pseudo code for a 3- digit combination lock of a suitcase and find the time complexity of the same.	(4)
	В)	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. $T(n)=2T(n/2)+4n \ \text{for } n>1$	(2)
2)	A)	Write the complete pseudocode of Merge_sort and find the time complexity of it in terms of input size n.	(7)
	B)	How many comparisons (both successful and unsuccessful) will be made by the bruteforce algorithm in searching for each of the following patterns in the binary text of one thousand zeros? a. 00001 b. 10000 c. 01010	(3)
3)	A)	Write an algorithm/pseudocode for insertion_Sort. Appply the insertion_sort on the following data set: 15, 2, 11, 4, 6 . [show each step of sorting clearly]	(5)
	B)	Compare divide & conquer and decrease & conquer with suitable example.	(2.5)
	C)	Dry run Horsepool's algorithm on the following string n substring.	(2.5)