

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**  
**(MID SEMESTER EXAMINATION MO/2023)**

**CLASS:** B.Tech  
**BRANCH:** ECE & EEE [Minor]

**SEMESTER :** VII  
**SESSION :** MO/2023

**SUBJECT: CS206 DESIGN AND ANALYSIS OF ALGORITHM**

**TIME:** 2 Hours

**FULL MARKS:** 25

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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		CO	BL
Q.1(a)	Explain various asymptotic notations with suitable examples.	[2]	CO1 4
Q.1(b)	Solve the recurrence relation for the Tower of Hanoi puzzle,  $T(n) = 0, \quad \text{if } N=0$ $= 2.T(n-1)+1, \quad \text{if } N>0$	[3]	CO1 3
Q.2(a)	Explain the methodology adopted in Merge Sort.	[2]	CO2 2
Q.2(b)	Explain the Binary Search approach. Write algorithm for Iterative Binary Search.	[3]	CO2 3
Q.3(a)	What do you understand by divide-and-conquer algorithm approach?	[2]	CO1 1
Q.3(b)	Illustrate the steps of Quick Sort for 6, 3, 2, 8, 4. Comment on time complexity.	[3]	CO2 3
Q.4(a)	What do you understand by Transform and Conquer approach?	[2]	CO1 1
Q.4(b)	Briefly describe the concept of AVL Trees.	[3]	CO1 1
Q.5(a)	Describe the Recurrence relations.	[2]	CO1 2
Q.5(b)	Briefly describe the maximum subarray problem using the divide-and-conquer method.	[3]	CO2 3

:::27/09/2023 E:::