Student Name: University Roll No.:	Printed Pages: 1

School of Engineering
First Theory Sessional Examination
Even Semester (AS: 2024-25)

B. Tech: CSE/CSE-CCML/CSE-IOTBC/CSE-AI [Year:3rd] [Semester:VI]

Course Title: Design & Analysis of Algorithms Course Code: BAI3602 [CSE-AI] BCS3602 [CSE/CSE-CCML/CSE-IOTBC]	Max Marks: 30 Time: 1*hrs*

Instructions: *1-Mention any assumptions made.*
2-Notations have usual meaning.

	SECTION 'A' Q.N.1. Attempt all parts of the following:	Course Objective	Marks
a)	What do you mean by algorithm ?	CO1	1
b)	Differentiate between Sequential search and Binary Search.	CO2	1
c)	Explain Big Omega (Ω) notation.	CO1	1
d)	Write the Properties of Binomial Heap.	CO2	1
e)	Compare the Algorithm and Pseudo code.	CO1	1
	SECTION 'B' **Q.N.2. Attempt any two parts of the following:**	**Course Objective**	**Marks**
a)	Solve the following recurrences using the master method: $T(1) = 0$ $T(n) = 4T(n/3)+n^3\log n$; $n>1$	CO2	7.5
b)	Write an algorithm for insertion sort. Find the time complexity of Insertion sort in all cases.	CO2	7.5

c)	Write the algorithm of Quick sort. Solve given array using Quick sort: A= {4, 5, 1, 7, 8, 9, 2, 88}	CO2	7.5
SECTION 'C' Q.N.3. Attempt any one parts of the following:		Course Objective	Marks
a)	Explain Heap sort with an algorithm. Apply the heap sort on the given Array: A={6, 14, 3, 25, 2, 10}	CO1	10
b)	Construct the Binomial heap for the following sequence: A={7, 2, 4, 17, 1, 11, 6}	CO2	10
c)	Explain Counting sort with an algorithm. Solve given array using counting sort: A={6, 0, 2, 0, 1, 3, 4, 6, 1, 3, 2}	CO1	10

Table 1: Mapping between COs and questions

Cos	Questions Numbers	Total Marks
CO1	1a,1c,1e,3a,3c	23
CO2	1b,1d,2a,2b, 2c, 3b	34.5