Roll No. | | | | | | | | | | | | |

SHAMBHUNATHINSTITUTEOFENGINEERINGANDTECHNOLOGY

Subject Code: BCS 503 **Subject:** Design and Analysis of Algorithm

Course: B.Tech.CS **Semester:** 6th

FIRST SESSIONAL EXAMINATION, EVEN SEMESTER, (2024-2025)

Branch: Computer Science & Engineering

Time–1hr30min **MaximumMarks–30**

NOTE :(Attempt all sections)

1. Attempt any FIVE questions.

QN	QUESTION	Marks	CO	BL
a.	Discuss the basic steps in the complete development of an algorithm.	2	CO1	L2
b.	Sort the following sequence {23, 11, 5, 15, 68, 31, 4, and 17} using merge sort.	2	CO2	L4
c.	Explain characteristics of algorithms.	2	CO1	L1
d.	Prove n^2=w (log n).	2	CO1	L3
e	Explain difference Between Shell sort and Radix sort.	2	CO2	L4
f	How we measure frequency of function.	2	CO1	L3

2. Attempt any *ONE* of the following.

QN	QUESTION	Marks	CO	BL
a.	What is Asymptotic Notation, explain types of notations.	5	CO1	L1
b.	Solve it T (n) =3T (n/9) +n^3.	5	CO2	L3
c.	Find the time Complexity of Binary Search.	5	CO1	L2

3. Attempt any FIVE questions.

QN	QUESTION	Marks	CO	BL
a.	Solve T (n) = 2T (n/4) +n^0.51.	2	CO2	L3
b.	What is Red Black Tree; explain characteristics of Red Black Tree.	2	CO2	L1
c.	Sort the following sequence {237, 146, 259, 342, 152, 163, 235, 47, 36, 42} using Radix Sort.	2	CO1	L5
d.	What is Heap? Write pseudo code of Heap sort.	2	CO1	L2
e	Explain best and worst time complexity of Quick Sort.	2	CO1	L2
f	Explain "Greedy Algorithm" Write its pseudo code.	2	CO2	L2

4.Attempt any *ONE* of the following.

QN	QUESTION	Marks	CO	BL
a.	What is Master Theorem? Define all cases for logarithmic polynomial.	5	CO1	L1
b.	Solve T (n) = 3T (n/3) +n^3 by using Recursion tree.	5	CO2	L3
c.	Write Shell Sort Algorithms Sort the following sequence {33, 31, 40, 8, 12, 17, 25, and 42} using shell sort.	5	CO2	L5

------ALL THE BEST-------