

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

**III - B.Tech II-Semester Regular Examinations (BR23), APRIL - 2026
ADVANCED DATA STRUCTURES AND ALGORITHMS ANALYSIS
(MINOR -Common to CIVIL, EEE & ECE Branches)**

Time: 3 hours

Max. Marks: 70

*Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B*

PART-A (10X2 = 20M)

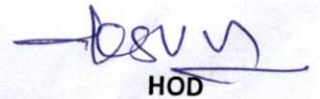
		Marks	CO	BL
1. a)	Define asymptotic notations?	(2M)	CO1	BL1
b)	Differentiate between Best, average and worst case efficiencies for time complexity?	(2M)	CO1	BL1
c)	Write the concept of divide and conquer method.?	(2M)	CO2	BL1
d)	Explain different types of graphs?	(2M)	CO2	BL2
e)	Define single source shortest path ?	(2M)	CO3	BL3
f)	Differentiate dynamic programming and greedy method ?	(2M)	CO3	BL1
g)	What are the factors that influence the efficiency of the backtracking?	(2M)	CO4	BL1
h)	Discover travelling sales person problem?	(2M)	CO4	BL2
i)	Explain class P problems?	(2M)	CO5	BL3
j)	Describe the job scheduling methods?	(2M)	CO5	BL1

PART-B (5X10 = 50M)

2a.	Explain about AVL tree and write the algorithm for AVL insertion operation?	5(M)	CO1	BL3
b.	What do you mean by balance factor in AVL tree and show the rotations with an example?.	5(M)	CO1	BL4
(OR)				
3a.	Explain the properties of B-tree /Construct the B-tree of order 3 performed by insertion operation from 15 set of elements	10(M)	CO1	BL4
4a.	What is heap? Explain about algorithm for max heap insertion with example	5(M)	CO2	BL2
b.	Build the quick sort algorithm with an example?	5(M)	CO2	BL3
(OR)				
5a	Classify graph search traversal DFS and BFS algorithms.?	10(M)	CO2	BL2
6a.	Analyze the Greedy Knapsack Problem with example ?	5(M)	CO3	BL2
b.	Simplify Single source shortest path problem with an example.	5(M)	CO3	BL4
(OR)				

7a.	What is minimum cost spanning tree? Explain Prim's and Kruskal's algorithm with suitable example?	10(M)	CO3	BL4
8a.	Explain the method of reduction to solve TSP problem using branch and bound?	5(M)	CO4	BL3
b.	Explain about 0/1 knapsack using the LC-branch and bound?	5(M)		
(OR)				
9a.	Define 8-Queen problem with an example?	10(M)	CO4	BL4
10a.	Give brief discussion about Cook's theorem and prove with example	5(M)	CO5	BL3
b.	Explain non-deterministic sorting and searching algorithms with class of P and NP with example?	5(M)	CO5	BL3
(OR)				
11a.	Discuss the general plan for analyzing the efficiency of a recursive algorithm.	5(M)	CO5	BL3
b.	Explain and prove the clique decision problem?	5(M)	CO5	BL4


STAFF


HOD