

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Fourth Semester**Computer Science and Engineering***CS3401 - Algorithms***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	What is meant by Algorithm?	L1	1	2
2.	Differentiate time and space complexity.	L2	1	2
3.	Define bipartite graph.	L1	2	2
4.	Differentiate BFS and DFS.	L2	2	2
5.	Discuss about binary search tree.	L2	3	2
6.	What is meant by Huffman trees?	L1	3	2
7.	List the uses of back tracking.	L1	4	2
8.	Explain 0/1 knapsack problem.	L2	4	2
9.	Describe about primality testing.	L2	5	2
10.	What is traveling salesman problem?	L1	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i How to measure an algorithm's running time and explain in detail?	L2	1	8
	ii With suitable example explain about insertion sort.	L2	1	8
	Or			
	b i Describe heap sort with suitable example.	L2	1	8
	ii Differentiate linear and binary search.	L2	1	8
12.	a i Differentiate prim's and kruskal algorithm.	L2	2	8
	ii Discuss about Floyd warshall algorithm with suitable example.	L2	2	8
	Or			
	b i Explain in detail about the dijkstra's shortest path algorithm with example.	L2	2	8
	ii How do you compute maximum flow using Ford-Fulkerson method explain with an example?	L2	2	8

13.	a	Describe in detail how merge sort algorithm uses the divide and conquer technique.	L3	3	16
		Or			
	b	Illustrate the workings of the maximum matching algorithm with an example.	L3	3	16
14.	a	Write backtracking algorithm for 4-Queen's problem and discuss the possible solution and find the optimal one.	L4	4	16
		Or			
	b	Apply backtracking technique to solve the following instance of subset sum problem: $A=\{3,5,6,7\}$ and $d=15$ and complete the state space tree.	L4	4	16
15.	a	Explain NP hard and NP completeness with examples.	L3	5	16
		Or			
	b	Find all the solution to the travelling salesman problem by exhaustive search. Give the optimal solution.	L3	5	16