

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 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)**

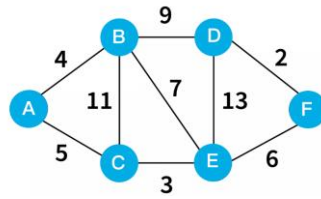
Q.No	Questions	BLT	CO	Marks
1.	Define Algorithms.	L1	1	2
2.	Differentiate linear search and binary search.	L2	1	2
3.	List any four representation of graph.	L1	2	2
4.	What do you mean by bipartite matching?	L1	2	2
5.	Brief divide and conquer method.	L1	3	2
6.	Infer greedy technique.	L2	3	2
7.	State Hamiltonian circuit.	L1	4	2
8.	Justify that the knapsack problem can be done by branch and bound method.	L2	4	2
9.	Compare tractable and intractable problem.	L2	5	2
10.	Write the algorithm for finding K th smallest number.	L2	5	2

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

Q.No	Questions	BLT	CO	Marks
11.	a i Explain the six steps processes in algorithmic problem solving.	L2	1	8
	i Elaborate an asymptotic notation with examples.	L2	1	8
	i			
	Or			
	b i Sketch the native string-matching algorithm with suitable pattern search example.	L2	1	8
	i			
	i Illustrate the binary search with suitable example.	L2	1	8
12.	a Compare and contest DFS and BFS algorithm. Justify the answer with suitable example.	L4	2	16

Or

- b i Show the following graph using Dijkstra's algorithm to find the shortest path between A to F. L4 2 8



- i Evaluate an algorithm for computing transitive closure of a directed graph using Warshall's algorithm. L4 2 8

13. a i Explain the quick sort algorithm with its working principle. Given the array $A = \{21, 10, 7, 15, 12, 19, 2, 3\}$, sort the array using the quick sort method and show the step-by-step partitioning process. L4 3 8

- i Explain the optimal binary search tree using dynamic programming concepts. L4 3 8

Or

- b i Explain the greedy approach for solving the activity-selection problem in detail. L4 3 8

- i Explain the steps involved in constructing a Huffman tree for the string "COMPILER", assuming the frequency of characters as follows: C=1, O=1, M=1, P=1, I=2, L=2, E=1, R=1. L4 3 8

14. a i Analyze how does backtracking work on the 8 queens' problem with suitable example. L3 4 8

- i Explain the subset sum problem using backtracking with example. L3 4 8

Or

- b i Explain how assignment problem could be solved using branch and bound technique. L3 4 8

- i Explain travelling salesman problem using branch and bound technique in detail. L3 4 8

15. a i Conclude the benefits of Venn diagram representation in problem solving. L5 5 4

- i Assess the NP-Hardness and NP-Completeness with suitable example. L5 5 12

Or

- b i Evaluate the approximation algorithm for TSP problem with example. L5 5 8

- i Examine the randomized algorithm with its complexity analyses. L5 5 8