SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

QUESTION BANK

IV SEMESTER
CS3464 – DESIGN AND ANALYSIS OF ALGORITHMS

Regulation – 2023

Academic Year 2024 – 2025 EVEN

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SUBJECT : CS3464 – DESIGN AND ANALYSIS OF ALGORITHMS

SEM / YEAR : IV / II

UNIT I - INTRODUCTION			
Algorithm analysis: Time and space complexity – Asymptotic Notations and its properties Best case, Worst case and average case analysis – Recurrence relation: substitution method – Lower bounds – searching: linear search, binary search and Interpolation Search, Pattern search: The naïve string–matching algorithm – Rabin– Karp algorithm – Knuth–Morris–Pratt algorithm. Sorting: Insertion sort – heap sort			
PART-A (2 - MARKS)			
Q. No	**QUESTIONS**	**Competence**	**BT Level**
1.	What do you mean by algorithm?	Remember	BTL-1
2.	What is performance measurement?	Remember	BTL-1
3.	Give the diagram representation of Notion of algorithm.	Understand	BTL-2
4.	Write Knuth-Morris-Pratt algorithm.	Analyze	BTL-4
5.	Describe space complexity?	Understand	BTL-2
6.	Calculate Complexity Analysis of Heap Sort.	Apply	BTL-3
7.	Describe algorithm design technique.	Understand	BTL-2
8.	Define Rabin-Karp algorithm.	Analyze	BTL-4
9.	What are the types of algorithm efficiencies?	Remember	BTL-1
10.	Describe “worst-case efficiency” of and algorithm.	Understand	BTL-2
11.	Show best-case efficiency.	Apply	BTL-3
12.	What is average case efficiency?	Remember	BTL-1
13.	Define asymptotic notations.	Remember	BTL-1
14.	Solve the asymptotic notation “Big oh” (0)	Apply	BTL-3
15.	Define the asymptotic notation “Omega” (Ω).	Remember	BTL-1
16.	Define the asymptotic notation “theta” (θ)	Remember	BTL-1
17.	Explain recursive algorithm?	Evaluate	BTL-5
18.	Evaluate How to measure an algorithm running time?	Evaluate	BTL-5
19.	Design and Define Linear Search.	Create	BTL-6
20.	Show What are the Best, Worst and Average Case complexity of Linear Search?	Apply	BTL-3
21.	Difference between Best Case and Worst Case Complexities.	Analyze	BTL-4
22.	Explain binary search?	Analyze	BTL-4

23.	Give computing time for Binary search?		Understand	BTL-2
24.	Design an algorithm for Iterative binary search?		Create	BTL-6
	PART-B (16- MARKS)			
1	Define the asymptotic notations used for best case average case and worst case analysis?	(16)	Remember	BTL-1
2	Write and assess in detail about naïve string–matching algorithm.	(16)	Evaluate	BTL-5
3	Explain Rabin– Karp algorithm in detail.	(16)	Analyze	BTL-4
4	What is meant by recurrence? Give one example to solve recurrence equations.	(16)	Remember	BTL-1
5	(i) Distinguish between Big Oh, Theta and Omega natation.	(8)	Analyze	BTL-4
	(ii) Analyze the best, worst and average case analysis for linear search.	(8)	Analyze	BTL-4
6	Find complexity of algorithm C (n) of the algorithm for the best, worst, average case,(evaluate average case complexity of n=3 n mean number of inputs.)	(16)	Understand	BTL-2
7	(i) Define Asymptotic notations. Distinguish between Asymptotic notation and Conditional asymptotic notation.	(8)	Understand	BTL-2
	ii) Explain how the removing condition is done from the conditional asymptotic notation with an example.	(8)	Understand	BTL-2
8	(i) Explain how analysis of linear search is done with a suitable illustration.	(8)	Analyze	BTL-4
	(ii) Define recurrence equation and explain how solving recurrence equations are done.	(8)	Analyze	BTL-4
9	Write algorithm for insertion sort and analyze about its Time Complexity.	(16)	Analyze	BTL-4
10	Discuss all the asymptotic notations in detail.	(16)	Understand	BTL-2
11	Write an algorithm for finding maximum element of an array, perform best, worst and average case complexity with appropriate order notations.	(16)	Remember	BTL-1
12	Write an algorithm heap sort and examine its complexity analysis.	(16)	Remember	BTL-1
13	(i)Write and explain the algorithm for Binary search and analyze its time complexity.	(8)	Remember	BTL-1
	(ii) Write the linear search algorithm and analyze its time complexity.	(8)	Remember	BTL-1
14	Find the time complexity and space complexity of the following problems. (i)Factorial using recursion	(8)	Apply	BTL-3
	(ii)Compute nth Fibonacci number using Iterative statements.	(8)	Apply	BTL-3
15	Exaplain Knuth-Morris-Pratt algorithm in detail.	(16)	Understand	BTL-2
16	Give the recursive algorithm which finds the number of binary digits in the binary representation of a positive decimal integer. Find the recurrence relation and complexity.	(16)	Create	BTL-6
17	Compare linear search, binary search and Interpolation Search based on complexity analysis	(16)	Apply	BTL-3

UNIT II GRAPH ALGORITHMS

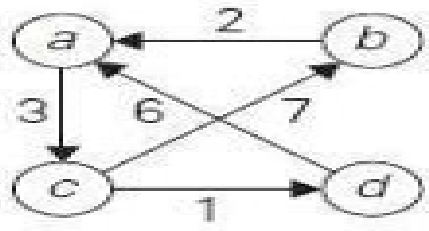
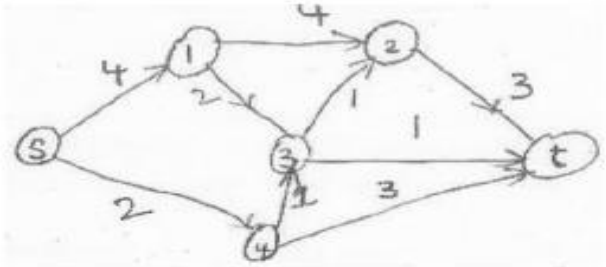
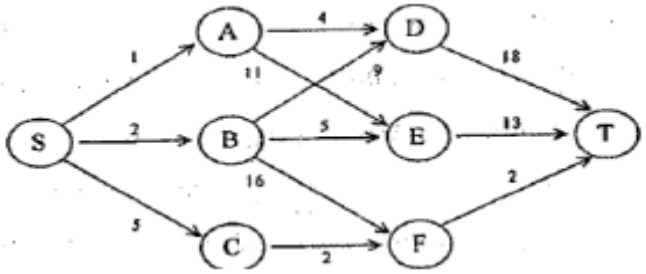
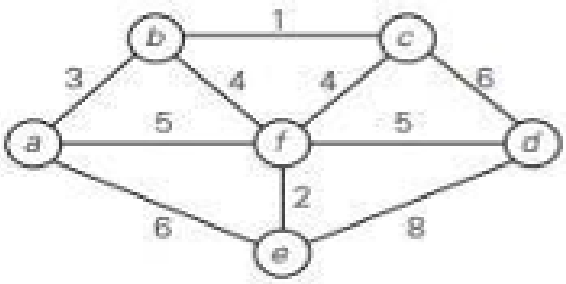
Graph algorithms: Representations of graphs – Graph traversal: DFS – BFS –applications– Connectivity, strong connectivity, bi–connectivity – Minimum spanning tree: Kruskal‘s and Prim‘s algorithm– Shortest path: Bellman–Ford algorithm – Dijkstra‘s algorithm – Floyd– Warshall algorithm ,Network flow: Flow networks – Ford–Fulkerson method – Matching: Maximum bipartite matching

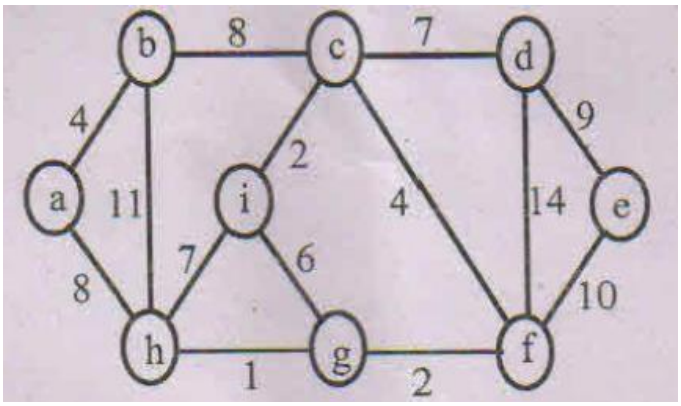
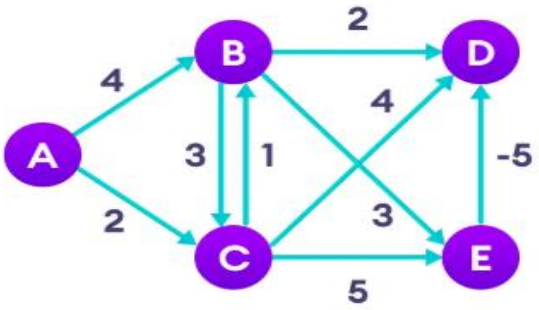
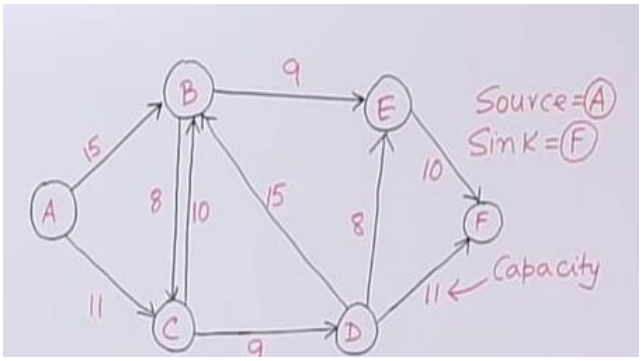
PART – A

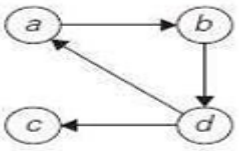
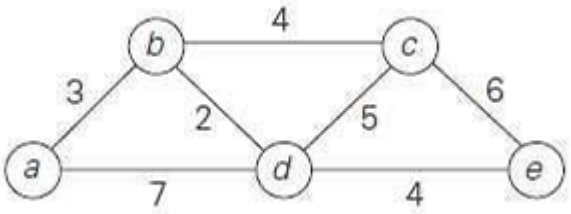
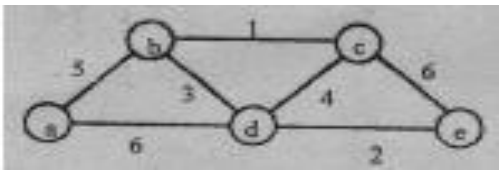
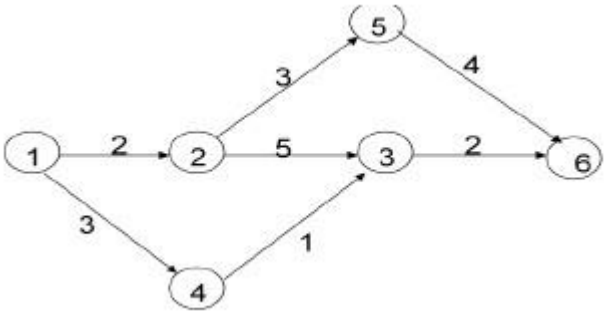
Q. No	QUESTIONS	Competence	BT Level
1.	What is the degree of a graph?	Understanding	BTL-2
2.	Define a graph.	Remembering	BTL-1
3.	Differentiate depth-first traversal and breadth-first traversal.	Analyzing	BTL-4
4.	What is Acyclic graph	Understanding	BTL-2
5.	Show the different types of Graph.	Remembering	BTL-3
6.	List the applications of graphs.	Remembering	BTL-1
7.	Compare prims and Kruskal algorithm.	Evaluating	BTL-5
8.	Write Kruskal algorithm.	Understanding	BTL-2
9.	What is a single source shortest path problem?	Remembering	BTL-1
10.	Prove that the number of odd degree vertices in a connected graph should be even.	Applying	BTL-3
11.	Assess about perfect matching in bipartite graph.	Applying	BTL-5
12.	Compare indegree, outdegree in a graph.	Analyzing	BTL-4
13.	Show What is a Spanning Tree.	Remembering	BTL-3
14.	Point out the advantage of Prims Algorithm.	Analyzing	BTL-4
15.	Discover the difference between Kruskal's Algorithm and Dijkstra’s algorithm.	Applying	BTL-3
16.	Define flow cut.	Understanding	BTL-2
17.	Analyze and Write down the optimization technique used for Warshalls algorithm. State the rules and assumptions which are implied behind that.	Analyzing	BTL-4
18.	Assess about Maximum-Flow problem	Evaluating	BTL-5
19.	Write Time complexity of Floyd-Warshall algorithm.	Evaluating	BTL-5
20.	List the constraint in the context of maximum flow problem.	Remembering	BTL-1
21.	How to calculate the efficiency of dijkstra’s algorithm.	Understanding	BTL-2
22.	Compare strongly connected graph and weakly connected graph.	Applying	BTL-3
23.	Generalize on Bipartite Graphs	Creating	BTL-6
24.	State the time complexity of prims and Kruskal algorithm.	Understanding	BTL-2

PART-B (16- MARKS)

1.	Write and analyze the algorithm for all pairs shortest path problem and describe the time and space complexity of the algorithm.	16	Analyzing	BTL-4

2.	Assess on how do you solve all pairs shortest path problem using Floyd's algorithm and write its time complexity 	16	Evaluating	BTL-5
3.	Analyze about the max-flow in the following network. 	16	Analyzing	BTL-4
4.	Compare and contrast the depth-first traversal and breadth-first traversal with example.	16	Analying	BTL-4
5.	Write Floyd algorithm and Examine about the algorithm to solve all pairs shortest paths problem 	16	Applying	BTL-3
6.	Explain in detail about different representation of graph.	16	Remembering	BTL-3
7.	Develop a minimum spanning tree using Kruskals algorithm and Explain it. 	16	Creating	BTL-6

8.	Analyze and Discuss about the algorithm and pseudocode to find the Minimum Spanning Tree using Prim's Algorithm. Find the Minimum Spanning Tree for the graph. Discuss about the efficiency of the algorithm. 		Analyzing	BTL-4
9.	Generalize on the concept of Bellman–Ford algorithm and solve. 		Creating	BTL-6
10.	Explain Graph traversal with example and list out its applications.		Evaluating	BTL-5
11.	How do you compute maximum flow for the following graph using Ford-Fulkerson method? 		Creating	BTL-6
12.	Assess on how do you solve all pairs shortest path problem using Warshall algorithm and write its time complexity.	16	Evaluating	BTL-5

				
13.	Exaplain Dijkstra's shortest path algorithm and its efficiency. 	16	Understanding	BTL-2
14.	Apply Kruskal's algorithm to find a minimum spanning tree of the following graph. 	16	Applying	BTL-3
15.	Write and Explain the algorithm for Maximum Bipartite Matching.	16	Evaluating	BTL-5
16.	Apply the shortest Augmenting Path algorithm to the network shown below. 	16	Applying	BTL-3
17.	State and Prove Maximum Flow Min cut Theorem	16	BTL-5	Evaluating

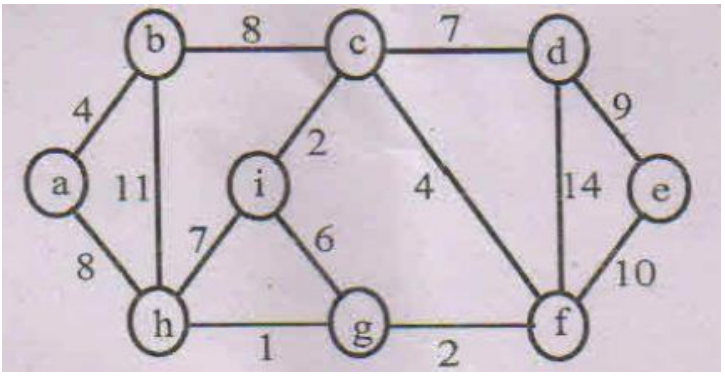
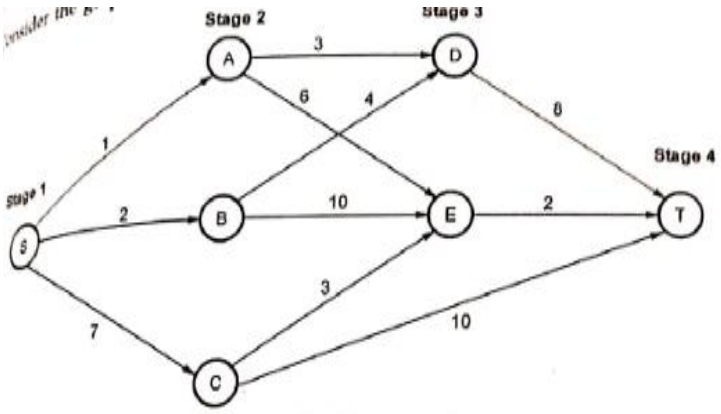
UNIT III ALGORITHM DESIGN TECHNIQUES

Divide and Conquer methodology: Finding maximum and minimum – Merge sort –Quick sort Dynamic programming: Elements of dynamic programming – Matrix–chain multiplication – Multi stage graph – Optimal Binary Search Trees. Greedy Technique: Elements of the greedy strategy – Activity–selection problem – Optimal Merge pattern –Huffman Trees.

PART A

Q. No	QUESTIONS	Competence	BT Level

1.	Give the general plan for divide-and-conquer algorithms.	Understanding		BTL-2
2.	List the advantages of Divide and Conquer Algorithm.	Remembering		BTL-1
3.	Show the recurrence relation of divide-and-conquer?	Applying		BTL-3
4.	Point out the Disadvantages in Quick Sort	Analyzing		BTL-4
5.	State Master's theorem.	Analyzing		BTL-4
6.	Differentiate quicksort and mergesort.	Understanding		BTL-4
7.	Define dynamic programming.	Remembering		BTL-1
8.	Write the general procedure of dynamic programming.	Remembering		BTL-1
9.	What is the time and space complexity of Merge sort?	Understanding		BTL-2
10.	Show the time complexity for Quick Sort.	Applying		BTL-3
11.	Asses the recurrence relation of merge sort.	Evaluating		BTL-5
12.	Give the Disadvantages of Divide and Conquer Algorithm.	Understanding		BTL-2
13.	Writet he Time complexity of Optimal Binary Search Tree.	Understanding		BTL-2
14.	compare dynamic programming and divide and conquer approaches.	Analyzing		BTL-4
15.	Write the difference between the Greedy method and Dynamic programming.	Remembering		BTL-1
16.	Define Optimal Binary Search Trees.	Remembering		BTL-1
17.	List out the memory functions used under Dynamic programming.	Applying		BTL-3
18.	Time complexity of Merge sort	Analyzing		BTL-4
19.	Define Huffman Tree.	Remembering		BTL-1
20.	State the general principle of greedy algorithm.	Evaluating		BTL-5
21.	List out the memory functions used under Dynamic programming.	Remembering		BTL-1
22.	Write the Pseudo-code for Greedy Algorithm	Evaluating		BTL-5
23.	Define multistage graphs. Give an example.	Understanding		BTL-2
24.	formulate the principle of optimality.	Creating		BTL-6
	PART-B (16- MARKS)			
1.	**Analyze** in detail about divide and conquer strategy with ascenario.	16	Analyzing	BTL-4
2.	**Illustrate about** Quicksort algorithm and write its timecomplexity for the list 5,3,1,9,8,2,4,7.	16	Applying	BTL-3
3.	Summarize in detail about the operation of binary search algorithm for the input -15, -6 , 0, 7 , 9, 23, 54, 82, 101,112, 125,131,142,151 if you are searching for the element 9.	16	Applying	BTL-3
4.	Write and explain the algorithm for quicksort. Provide a complete analysis of quick sort for the given set of numbers 12,33,23,43,44,55,64,77 and 76.	16	Analyzing	BTL-4
5.	Write and explain pseudo code using divide and conquer technique for finding the position of the largest element in an array of N numbers.	16	Analyzing	BTL-4
6.	(i)Find the number of comparisons required to search for '6'in the given Sequence of numbers: 10, 19, 7, 9, 6, 15.	8	Analyzing	BTL-4

	(ii) Analyze the time efficiency and drawbacks of merge sort algorithm.	8		
7.	Develop and explain multistage graph for finding the single-source shortestpaths for the given graph. 	16	Creating	BTL-6
8.	What is divide and conquer strategy and generalize the concept of the binary search with suitable example problem.	16	Creating	BTL-6
9.	Trace the steps of Mergesort algorithm for the elements 122, 25,70,175,89,90,95,102,123 and also compute its time complexity.	16	Evaluating	BTL-5
10.	Write an algorithm to perform binary search on a sorted list of elements. Analyze the algorithm for the best case, average case and worst case.Summarize	16	Analyzing	BTL-4
11.	**Analyze** the algorithm by applying the following keys and probabilities to obtain the optimal binary tree. <table><tr><td>Key</td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>Probability</td><td>0.1</td><td>0.2</td><td>0.4</td><td>0.3</td></tr></table>	16	Analyzing	BTL-4
12.	**Examine** how multistage graph for finding the single-source shortestpaths for the given graph. 	16	Remembering	BTL-1
13.	Generalize on matrix chain multiplication in detail	16	Creating	BTL-6
14.	(i)Write an algorithm to construct the optimal binary search tree with time complexity .	8	Understanding	BTL-2

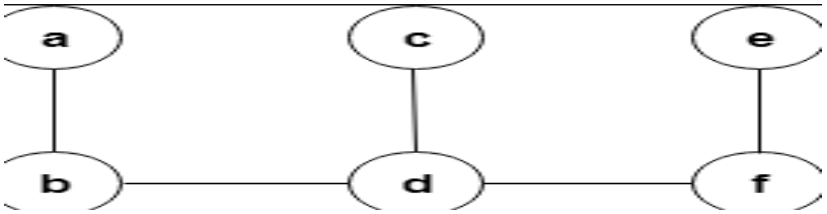
	(ii)Discuss the algorithm for finding a minimum cost binary search trees.(8)	8		
15.	Explain the steps in building Huffman Tree.Find the codes forthe alphabets given below according to the frequency. Let _(Space)= 4 A= 2 , E = 5 , H = 1, I = 2, L = 2, M = 2 , P = 2R = 1,S =2 , X = 1	16	Remembering	BTL-1
16.	**Illustrate** how the problem of optimal merge pattern can be solved using dynamic programming approach.	16	Evaluating	BTL-5
17.	(i)Define Huffman tree. List the types of Encoding in Huffman tree.	8	Understanding	BTL-2
	(ii)Write the Huffman's algorithm. Construct the Huffman's tree for the following data and obtain its Huffman code. **Character** A B C D E _(Underscore) **Probability** 0.5 0.35 0.5 0.1 0.4 0.2	8		

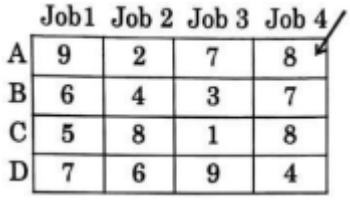
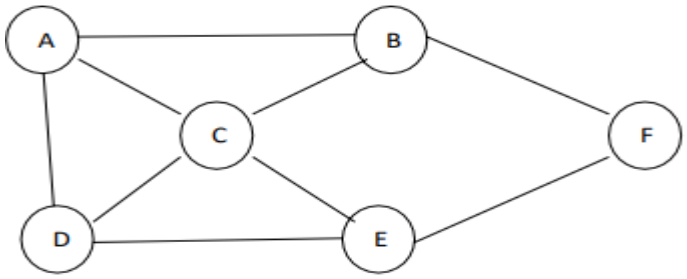
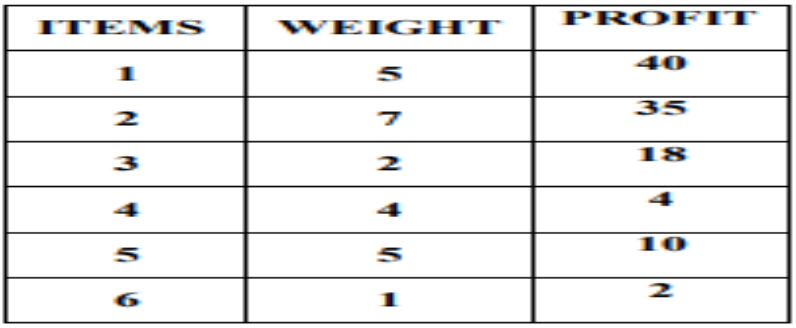
UNIT IV STATE SPACE SEARCH ALGORITHMS

Backtracking: n–Queens problem – Hamiltonian Circuit Problem – Subset Sum Problem – Graph colouring problem Branch and Bound: Solving 15–Puzzle problem –Assignment problem – Knapsack Problem – Travelling Salesman Problem

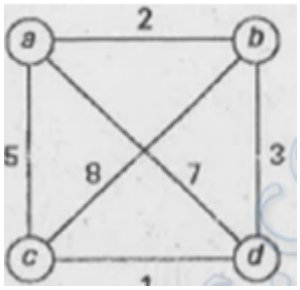
PART-A

	Questions	Competence	BT Level
1.	Define Backtracking algorithm.	Remembering	BTL-1
2.	Why a travelling salesman problem cannot be solved by Backtracking Algorithm?	Understanding	BTL-2
3.	Assess the use of a state space tree.	Applying	BTL-3
4.	Differentiate between Backtracking and Branch and Bound Algorithm.	Analyzing	BTL-4
5.	State the reasons that affects the efficiency of backtracking algorithm.	Applying	BTL-3
6.	List the problems that can be solved by using backtracking Algorithms.	Understanding	BTL-2
7.	Define N-queen's Problem.	Remembering	BTL-1
8.	How many possible solutions exist for an 8 queen's problem?		
9.	Define a subset-Sum Problem.	Remembering	BTL-1
10.	Pointout the algorithms used in Hamiltonian path problem.		
11.	Assess the working procedure of Brute Force Search Algorithm.	Analyzing	BTL-4
12.	Differentiate between Implicit and explicit constraint.	Analyzing	BTL-4

13.	How many Hamiltonian paths does the following graph have?  		Analyzing	BTL-4
14.	Define the chromatic number used in graph coloring applijcation.		Remembering	BTL-1
15.	Differentiate between Implcit and explicit constraints.		Analyzing	BTL-4
16.	What is meant by state and non state problems?		Remembering	BTL-1
17.	Define Graph coloring algorithm and its applications.		Remembering	BTL-1
18.	Does backtracking always leads to optimal solutions? Justify.		Creating	BTL-6
19.	Examine the Knapsack Problem.		Evaluating	BTL-5
20.	State the real life applications of Knapsack Problem.		Understanding	BTL-2
21.	Differentiate between backtracking and branch and bound technique.		Analyzing	BTL-4
22.	State Travelling salesman Problem.		Understanding	BTL-2
23.	What do you mean by 15-puzzle problem?		Remembering	BTL-1
24.	State the steps used to solve a problem in Travelling Salesman Problem.		Understanding	BTL-2
	PART-B (16- MARKS)			
1.	Explain in detail about the Backtracking approach with an example.	16	Applying	BTL-3
2.	State the subset-sum problem and Complete state-space tree of the backtracking algorithm applied to the instance A={3, 5, 6, 7} and d=15 of the subset-sum problem.[M-16]	16	Understanding	BTL-2
3.	Explain in detail about N-Queens Problem with diagrams and algorithm.	16	Creating	BTL-6
4.	Using Back-Tracking enumerate how can you solve the following problems. (i) 4-queens problem. (ii) Hamiltonian circuit problem.	 8 8	Evaluating	BTL-5
5.	(i) Evaluate the subset sum problem with set as {3, 5, 6, 7, 2}and the sum =15.Derive all the subsets. (ii) Evaluate the following instance of the knapsack problem using the branch and bound algorithm. Knapsack capacity W=10. Item Weight Value 1 4 $40 2 7 $42 3 5 $25 4 3 $12	8 8	Evaluating	BTL-5
6.	Explain briefly about Assignment Problem using Branch and Bound Technique.	16	Evaluate	BTL-5
7.	Explain in detail about the graph coloring problem with proper algorithm and diagram.	16	Analyzing	BTL-4
8.	Let w= {5, 7, 10, 12, 15, 18, 20} and m=35.Find all possible subset	16	Creating	BTL-6

	of w whose sum is equivalent to m. Draw the portion of state space tree for this problem.			
9.	Explain briefly about Branch and Bound with an example and an algorithm.	16	Evaluate	BTL-5
10.	Find an optimal solution using branch and bound for the following assignment problem:  	16	Understanding	BTL-2
11.	Explain in detail about Hamiltonian circuit problem with algorithm. Evaluate Hamiltonian circuit problem for the graph given below:  	16	Evaluate	BTL-5
12.	Solve the following instance of knapsack problem by branch and bound algorithm W= 15. 	16	Evaluate	BTL-5

ITEMS	WEIGHT	PROFIT
1	5	40
2	7	35
3	2	18
4	4	4
5	5	10
6	1	2

13.	Consider the travelling salesperson instances defined by the following cost matrix.  ∞ 20 30 10 11 15 ∞ 16 4 2 3 5 ∞ 2 4 19 6 18 ∞ 3 16 4 7 16 ∞ Draw the state space and show the reduced matrices corresponding to each of the node.	16	Evaluate	BTL-5
14.	Let w={5,7,10,12,15,18,20} and m=35.Compute all possible subset of w whose sum is equivalent to m. Draw the portion of state space tree for this problem.	16	Creating	BTL-6
15.	Explain the 4-Queen's problem using backtracking. Write the algorithms. Give the estimated cost for all possible solutions of 4-Queen's problem. Specify the implicit and explicit constraints.	16	Analyzing	BTL-4
16.	Apply Branch and Bound algorithm to solve the travelling salesman problem for the graph below:  	16	Analyzing	BTL-4
17.	Explain in detail how 15 puzzle problem is solved using branch and bound technique.	16	Creating	BTL-6

UNIT V NP–COMPLETE AND APPROXIMATION ALGORITHM

Tractable and intractable problems: Polynomial time algorithms – Venn diagram representation – NP–algorithms – NP–hardness and NP–completeness – Bin Packing problem – Problem reduction: TSP – 3–CNF problem. Approximation Algorithms: TSP –Randomized Algorithms: concept and application – primality testing – randomized quick sort – Finding kth smallest number

PART-A

	Questions	Competence	BTL
1.	Define NP-hard and NP-Complete problems.	Remembering	BTL-1
2.	List out the characteristics of tractable and intractable problems.	Understanding	BTL-2
3.	Compare class P and class NP.	Analyzing	BTL-4
4.	Give the examples of NP complete problems.	Remembering	BTL-1
5.	Demonstrate approximation for NP-Hard Problem.	Understanding	BTL-2
6.	What is satisfiability problem?	Remembering	BTL-1
7.	State optimization problem.	Understanding	BTL-2

8.	Differentiate between deterministic and non deterministic algorithms.		Analyzing	BTL-4
9.	What do you mean by Vertex Cover Problem?		Remembering	BTL-1
10.	List out the examples of NP-Hard Problems.		Understanding	BTL-2
11.	How would you assess optimization problems?		Remembering	BTL-1
12.	State Bin Packing Problem and its mathematical formulation.		Understanding	BTL-2
13.	How will you specify CNF Problem?		Creating	BTL-6
14.	Define Approximation Algorithms.		Remembering	BTL-1
15.	Assess Performance ratio in approximation algorithm.		Applying	BTL-3
16.	What is meant by Primality Testing?		Remembering	BTL-1
17.	How would you recognize the kth smallest number?		Evaluate	BTL-5
18.	State Randomized Quick Sort.		Understanding	BTL-2
19.	Assess how the reduction of the CNF-Satisfiability problem to clique decision problem can be done in polynomial time.		Applying	BTL-3
20.	State which class does CNF satisfiability problem belongs to: NP Hard /NP-Complete?		Analyzing	BTL-4
21.	Define maxclique problem.		Remembering	BTL-1
22.	What is meant by the “Halting Problem”?		Understanding	BTL-2
23.	List two problems that have polynomial time algorithms. Justify your statement.		Understanding	BTL-2
24.	Give the role of Venn Diagrams in problem solving.		Evaluate	BTL-5
	PART-B			
1.	Explain in detail about the approximation algorithm for NP-hard problem.	16	Analyzing	BTL-4
2.	Discuss about class P,NP problems with diagrams and algorithms.	16	Understanding	BTL-2
3.	Describe with suitable diagrams and examples of how venn diagrams are useful in problem solving.	16	Understanding	BTL-2
4.	Analyze in detail about the Randomized quick Sort with suitable example.	16	Analyzing	BTL-4
5.	Write short notes on : (a) Problem Reduction (b) Primality Testing (c) Randomized Sorting	8 4 4	Analyzing	BTL-4
6.	Explain in detail about Bin Packing Algorithm.	16	Analyzing	BTL-4
7.	Briefly explain how the approximation algorithms is applied in Travelling salesman problem.	16	Evaluate	BTL-5
8.	Explain in detail TSP with Triangle inequality.	16	Applying	BTL-3
9.	Discuss briefly about complexity classes and their types and their relationship.	16	Analyzing	BTL-4
10.	Examine 3-CNF Problem with example. Does it belongs to NP Complete class. Justify your answer.	16	Evaluate	BTL-5
11.	Write short notes on: (a) Monte Carlo Algorithms. (b) Miller-Rabin Algorithms.	8 8	Understanding	BTL-2

12.	Elaborate on the nearest-neighbor algorithm and multifragment-heuristic algorithm for TSP problem.	16	Evaluate	BTL-5
13.	How will you prove that max-clique problem is NP-Complete? If not, why? Discuss with suitable points.	16	Evaluate	BTL-5
14.	Explain with suitable points that Travelling Salesman problem is NP-Hard. If not, Why?	16	Evaluate	BTL-5
15.	Describe with suitable steps on finding kth smallest integer.	16	Creating	BTL-6
16.	A kite is a graph on an even number of vertices, say 2n, in which n of the vertices form a clique and the remaining n vertices are connected in a "tail" that consists of a path joined to one of the vertices of the clique. Given a graph and a goal g, the KITE problem asks for a subgraph which is a kite and which contains 2g nodes. Prove that KITE is NP-complete.	16	Creating	BTL-6
17.	In the EXACT 4SAT problem, the input is a set of clauses, each of which is a disjunction of exactly four literals, and such that each variable occurs at most once in each clause. The goal is to find a satisfying assignment, if one exists. Prove that EXACT 4SAT is NP-complete.	16	Creating	BTL-6