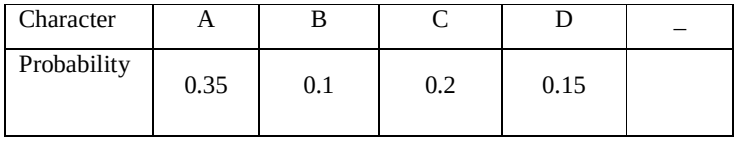
UNIT-I / PART-A	
1	Define Algorithm. *(June 06,07,May 13)*
2	Define order of an algorithm. *(June 07)*
3	What are the different criteria used to improve the effectiveness of algorithm? *(June 06,07)*
4	What are the features of efficient algorithm*?(Dec 07)*
5	What is an algorithm design techniques? *(Dec 06)*
6	Mention the most important problem types. *(Dec 07,Apr 08)*
7	Write down formula for Space and Time Complexity Calculation? *(Dec 13)*
8	List the properties of asymptotic notations. *(June 06)*
UNIT-I / PART-B	
1	Explain the fundamentals of algorithmic problem solving. (OR) Discuss briefly the sequence of steps in designing and analyzing an algorithm. ***(Dec 06)***
2	Explain the various asymptotic notations of an algorithm in detail. ***(Dec 07)***
3	a) Solve the recurrence equation of the Fibonacci Series. T(n) = T(n-1) +T(n-2) subject to T(0)=0, T(1) = 1**.** ***(June 07,May 08)*** b) Write the general plan for analyzing time efficiency of non recursive algorithms and find the time complexity of element uniqueness problem. ***(Dec 07)***
4	Design a recursive algorithm to find the number of moves in tower of Hanoi problem and find the time of complexity. ***(Dec 013)***
UNIT-II / PART-A	
1	Define Knapsack problem.*(Dec 14)*
2	Define divide and conquer design technique. *(May 13)*
3	Define Binary Search. *(Dec 07)*
4	Define Stassen's matrix multiplication. *(Dec 07)*
5	What is Brute Force?
6	Define Exhaustive search.
7	What is median-of-three –portioning method?
8	Define Convex-Hull Problem.
UNIT-II / PART-B	
1	Write an algorithm for merge sorting. Show the intermediate steps when the numbers 310, 285, 179, 652, 351, 423, 861, 254, 450, 520 are sorted using Merge Sort***.(Dec 14)***
2	Write an algorithm for binary search using divide and conquer and analyze the time complexity***.(June 06,Dec 14)***
3	Sort the following set of elements using quick sort. 12,24,8,71,4,23,6 ***(June 06)***
4	Write Strassen's matrix multiplication algorithm. Is there any time efficiency improvement compared to ordinary matrix multiplication?

UNIT-III / PART-A

1	Define principle of optimality.*(Dec 14)*
2	Define Optimal Binary Search Tree (OBST). *(June 06)*
3	Define Memory function techniques. (*Dec 06*)
4	Define feasible solution. *(Dec 13)*
5	Define optimal solution. *(June 07,Dec 13)*
6	Define minimum spanning tree. *(June 06,07)*
7	Define Huffman code. (*Dec 06*)
8	Define binomial coefficient.

UNIT – III / PART-B

1	Explain an algorithm to find optimal binary search tree with example***.(Dec 07,14)***
2	Write an memory function algorithm to solve the following knapsack problem. ***(Dec 07)***  Knapsack capacity W= 5
3	Explain the method for finding the minimum spanning tree for a connected graph using Prim's algorithm and Kruskal's algorithm with own example. ***(Dec 06,07June 06,Dec 14)***
4	Consideer the five character alphabet {A,B,C,D,_} with the following occurence probabilities and construct huffman tree. 

item	weight	value
1	2	$12
2	1	$10
3	3	$20
4	2	$15

Character	A	B	C	D	_
Probability	0.35	0.1	0.2	0.15	

UNIT-IV / PART-A

1	Define simplex method.
2	What is the need of maximum-flow problem?
3	Write the optimization function for maximum-flow problem.
4	Define Ford-Fulkerson method.
5	What is mean by bipartite graph? (or) Define 2-colorable in bipartite graph.
6	What is mean by stable marriage problem?
7	Prove that the stable marriage algorithm terminates after no more than n^2 iterations with a stable marriage output.
8	What do you mean by maximum weight matching?

UNIT-IV/PART-B

1	Solve the following problem using simplex method: maximize $Z = 3x + 5y$ subject to $x + y \leq 4$ $x + 3y \leq 6$

	$x \geq 0, y \geq 0$.
2	Explain the maximum flow problem with an example.
3	Explain maximum matching problem in bipartite graphs.
4	Solve the instance of the stable marriage problem given by the ranking matrix and find the stable and unstable matching.

Ranking matrix

	Ann	Lea	Sue
Bob	2,3	1,2	3,3
Jim	3,1	1,3	2,1
Tom	3,2	2,1	1,2

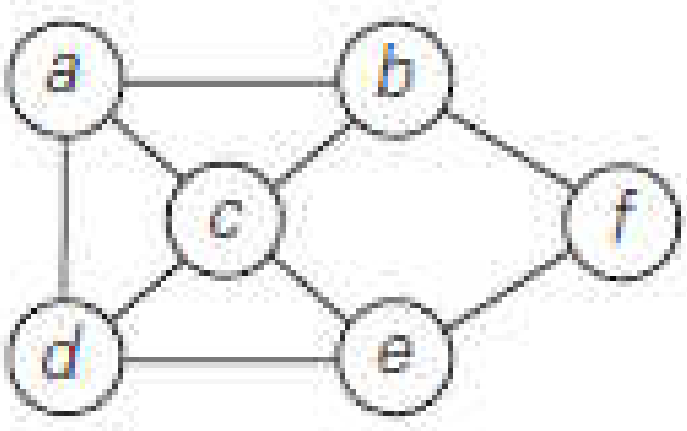
UNIT-V/PART-A

1	Define Non Polynomial (NP) problem with an example. *(Dec 06)*
2	Mention the relation between P, NP, NP-Hard and NP Complete Problem
3	Define backtracking. *(June 06)*
4	Define state space tree. *(Dec 06)*
5	Define Hamiltonian circuit.*(June 06, Dec14)*
6	Define Deterministic algorithm and Non-Deterministic algorithm.
7	Define cost of tour. *(Dec 14)*
8	Define Live and Dead nodes. *(Dec 14)*

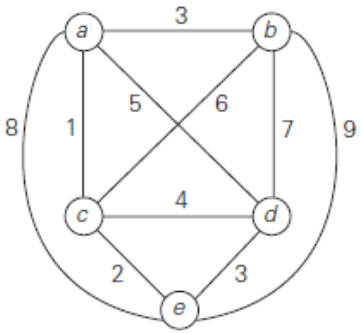
UNIT-V / PART-B (ANY FOUR)

1	Explain n-queen's problem. Draw a portion of the state space tree and perform backtracking search for a solution to 4-queens problem. ***(June 06,Dec07,14)***
2	i)Write a pseudo code for backtracking algorithm and apply backtracking to solve the following instances of the subset sum problem: S= {1, 3, 4,5} d=11 and d=8. ***(Dec 06)***

ii) Explain Hamiltonian circuit in a graph. Use backtracking to get a Hamiltonian circuit of following the graph***.(Dec 07)***



3 Solve the following instance of the travelling salesman problem by branch and bound method and explain in detail. ***(Dec 07)***



4 Apply the branch and bound algorithm to solve the following knapsack problem and explain in detail. ***(Dec 06)***

Item	Weight	value
1	2	1
2	3	2
3	4	5

The knapsack capacity W is 6.

5 Solve the following assignment problem using branch and bound technique. Explain in detail how branch and bound technique is useful for solving assignment problems.

$$C = \begin{array}{c} \begin{matrix} \text{job 1} & \text{job 2} & \text{job 3} & \text{job 4} \end{matrix} \\ \begin{bmatrix} 9 & 2 & 7 & 8 \\ 6 & 4 & 3 & 7 \\ 5 & 8 & 1 & 8 \\ 7 & 6 & 9 & 4 \end{bmatrix} \end{array} \begin{matrix} \\ \text{person } a \\ \text{person } b \\ \text{person } c \\ \text{person } d \end{matrix}$$