

2Q:-

Set-1:

1Q. 2AQ:- Discuss Backtracking algorithm.

- a) line node b) E-node c) Answer node  
d) Answer node e) Dead node f) Answer.

(or)

2Q. 2BQ:- Discuss alg of Hamiltonian Cycle and Graph coloring.

Draw state space tree for  $n=4$  &  $m=3$  graph coloring problem.

3Q. Set-II

2AQ:- what is sum-of-subsets problem?  
Solve sum-of-subsets using Backtracking.  
Let  $n=6$ ,  $m=30$  &  $w[1:6] = [5, 10, 12, 13, 15, 18]$   
(Draw state space tree & solution using fixed-tuple sized format).

4Q.

(or)  
2BQ:- Discuss 4-Queens problem with state space tree & solution tree. write alg for  $N$ -Queen problem.

1Q:- Set-I

1. 1AQ:- what is OBST? write alg of time complexity for OBST. Construct OBST with

Let  $n=4$ ;  $(a_1, a_2, a_3, a_4) = (do, if, int, while)$ ;

$P[1:4] = (3, 3, 1, 1)$ ;  $q[0:4] = (2, 3, 1, 1, 1)$ .

the  $P$ 's and  $q$ 's have been multiplied by 16.

(OR)

2. 1BQ:- Describe Travelling Salesperson Problem. Construct optimal tour for (TSP)

|   | 1 | 2  | 3  | 4  |
|---|---|----|----|----|
| 1 | 0 | 10 | 15 | 20 |
| 2 | 5 | 0  | 9  | 10 |
| 3 | 6 | 13 | 0  | 12 |
| 4 | 8 | 8  | 9  | 0  |

Set-II

3. 1AQ:- Concepts of reliability design problem. Design three-stage system with device types  $D_1, D_2$  &  $D_3$ . Cost are \$30, \$15 & \$20. Reliability is 0.9, 0.8 & 0.5. The total cost of system must not be more than  $C = \$105$ .

4. 1B (1)Q:- #0/1 Knapsack,  $n=4, m=16, P_i(P_1, P_2, P_3, P_4) = (10, 6, 5, 1), w_i(w_1, w_2, w_3, w_4) = (9, 6, 7, 3)$  Using Dynamic programming.

2Q:- Write Alg (Floyd-Warshall alg) for all-pairs Shortest Path Problem.