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NPTEL

Courses » Selected Topics in Decision Modeling

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Unit 3 - Week 2

Course outline

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Week 1

Week 2

● Lecture 6 : Machine Allocation and Cargo Loading Problem

● Lecture 7 : Knapsack Problem

● Lecture 8 : Probabilistic Dynamic Programming

○ Lecture 9 : Probabilistic Dynamic Programming (Contd.)

● Lecture 10 : Dijkstra's Algorithm

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Week 3

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Assignment 2

The due date for submitting this assignment has passed.   **Due on 2018-09-05, 23:59 IST.**
As per our records you have not submitted this assignment.

1)   *1 point*

4 relief teams are available to allocate among four locations to improve medical care. I required to determine how many teams to allocate to each of these locations to maxim the total effectiveness of the four teams. Number of teams allocated to each location m be an integer (0 to 4). The table below gives the estimated persons benefitted (in multip of 1,000) for each location for each possible allocation of relief medical teams.

Relief Teams	Persons Benefitted			
	Location 1	Location 2	Location 3	Location 4
0	0	0	0	0
1	20	40	50	30
2	50	65	70	75
3	80	90	95	100
4	110	115	110	115

Number of stages in the given problem will be:

○ i. 4

○ ii. 5

○ iii. 6

○ iv. 7

No, the answer is incorrect.
Score: 0

Accepted Answers:
i. 4

2) Consider Question 1 again. Number of states or decision options in each stage will be: *1 point*

○ i. 4

○ ii. 5

○ iii. 6

○ iv. 7

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i. 110

ii. 115

iii. 120

iv. 140

No, the answer is incorrect.
Score: 0

Accepted Answers:
iii. 120

4) Consider Question 1 again. If we send relief teams to any of the locations, then the maximum number **1 point** of persons benefitted (in thousands) will be:

i. 125

ii. 145

iii. 150

iv. 165

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv. 165

5)　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　**1 point**

A railway wagon is to be loaded with 4 items in any quantity. The maximum item load the wagon can have is 5 tons. The table below shows the details.

Item No	Weight (in ton)	Profit (in '000 Rs.)
1	2	27
2	1	12
3	3	43
4	2	25

Number of stages in the given problem will be:

i. 1

ii. 2

iii. 3

iv. 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv. 4

6) Consider Question 5 again. Number of states in each stage will be:　　　　　　　**1 point**

i. 4

ii. 5

iii. 6

iv. 7

No, the answer is incorrect.
Score: 0

Accepted Answers:
iii. 6

7) Consider Question 5 again. Solve it by Dynamic Programming. Maximum profit for the optimal wagon **1 point** load without exceeding weight limit will be:

i. 68

    ◯ ii. 70

    ◯ iii. 72

    ◯ iv. 76

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii. 70

8) Consider Question 5 again. But this time assume that Item 3 cannot be loaded to the wagon at all.   ***1 point***
Solve it by Dynamic Programming along with this new condition. Maximum profit for the optimal wagon load
without exceeding weight limit for this case will be:

    ◯ i. 64

    ◯ ii. 66

    ◯ iii. 68

    ◯ iv. 70

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii. 66

9) Knapsack problem is a type of: ***1 point***

    ◯ i. Integer Linear Program

    ◯ ii. Mixed-integer Linear Program

    ◯ iii. Integer Nonlinear Program

    ◯ iv. Mixed-integer Nonlinear Program

No, the answer is incorrect.
Score: 0

Accepted Answers:
i. Integer Linear Program

10) Cargo-loading problem as described in the lectures is a type of Knapsack problem: ***1 point***

    ◯ i. sometimes

    ◯ ii. always

    ◯ iii. never

    ◯ iv. cannot be said

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii. always

11) For an Probabilistic Investment Problem, we have: ***1 point***

    ◯ i. Choice of investment options are deterministic but the corresponsing returns are probabilistic

    ◯ ii. Choice of investment options are deterministic and the corresponsing returns are also deterministic

    ◯ iii. Choice of investment options are probabilistic and the corresponsing returns are also probabilistic

    ◯ iv. Choice of investment options are probabilistic but the corresponsing returns are deterministic

No, the answer is incorrect.
Score: 0

Accepted Answers:
i. Choice of investment options are deterministic but the corresponsing returns are probabilistic

12) For an Probabilistic Investment Problem being solved by Dynamic Programming, we have: ***1 point***

    ◯ i. Optimal decision in if-then-else form and a deterministic optimal payoff

◯ ii. Optimal decision in if-then-else form and a optimal expected payoff

◯ iii. A deterministic optimal decision and a deterministic optimal payoff

◯ iv. A deterministic optimal decision and a optimal expected payoff

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii. Optimal decision in if-then-else form and a optimal expected payoff

13)　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　*1 point*

While solving a Shortest Path Problem by Dijkstra's Algortihm, the following table is obtained at the final step.

Step n	s	a	b	c	d	t
Temp. label I(i)	0	22	50	94	79	124
Permanent	Yes	Yes	Yes	Yes	Yes	Yes
Made from	-	s	a	a	b	d

The shortest Distance from 's' to 't' is:

◯ i. 72

◯ ii. 101

◯ iii. 116

◯ iv. 124

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv. 124

14) Refer Question 13 again. Shortest Path between 's' and 't' is:　　　　　*1 point*

◯ i. s-a-c-t

◯ ii. s-a-b-c-t

◯ iii. s-a-b-d-t

◯ iv. s-a-c-d-t

No, the answer is incorrect.
Score: 0

Accepted Answers:
iii. s-a-b-d-t

15) Refer Question 13 again. Shortest Distance between 'c' and 't' is:　　　　　*1 point*

◯ i. 30

◯ ii. 124

◯ iii. 174

◯ iv. Cannot be found out from the given table

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv. Cannot be found out from the given table

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