Final Practice Exam

Due No due datePoints 45Questions 45Available until Aug 14 at 6:59pmTime Limit None

Allowed Attempts Unlimited

Instructions

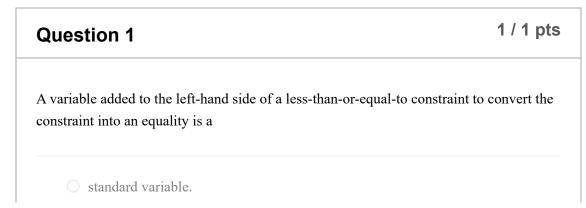
- This final practice exam is for practice purposes only.
- There is no time limit and unlimited attempts.
- You will be able to see the correct answers only after the submission.
- · Coverage:
 - Chapter 2: An Introduction to Linear Programming
 - Chapter 3: Sensitivity Analysis and Interpretations of Solution
 - Chapter 4: Applications in Marketing, Finance, and OM
 - Chapter 6: Distribution and Network Models
 - Chapter 7: Integer Linear Programming
 - Chapter 10: Inventory Models
 - Chapter 11: Waiting Line Models
 - Chapter 13: Decision Analysis

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	56 minutes	36 out of 45

Submitted Aug 14 at 1:14pm



Correct!

slack variable.		
o surplus variable.		
onnnegative variable.		

Question 2 1 / 1 pts

Dorm Furnishings manufactures two types of desks. Requirements for each desk are given below.

Standing Desk Executive Desk Available Wood panels 3 4 36 Hardware assembly (hours) 5 4 40 Staining time (hours) 5 2 30

The profits for Standing and Executive desk are \$1000 and \$1100, respectively.

What is the constraint for staining time?

- $3S + 4E \le 36$
- $0.5S + 4E \le 40$

- 5S + 2E \leq 30
- 0.000S + 1100E

Question 3

1 / 1 pts

Dorm Furnishings manufactures two types of desks. Requirements for each desk are given below.

	_		
Wood panels	3	4	36
Hardware assembly (hours)	5	4	40
Staining time (hours)	5	2	30

The profits for Standing and Executive desk are \$1000 and \$1100, respectively.

What is the constraint for wood panels?

Correct!

- $3S + 4E \le 36$
- $0.5S + 4E \le 40$
- $0.5S + 2E \le 30$
- 0 1000S + 1100E

Question 4

1 / 1 pts

Which of the following special cases requires reformulation of the problem in order to obtain a solution?

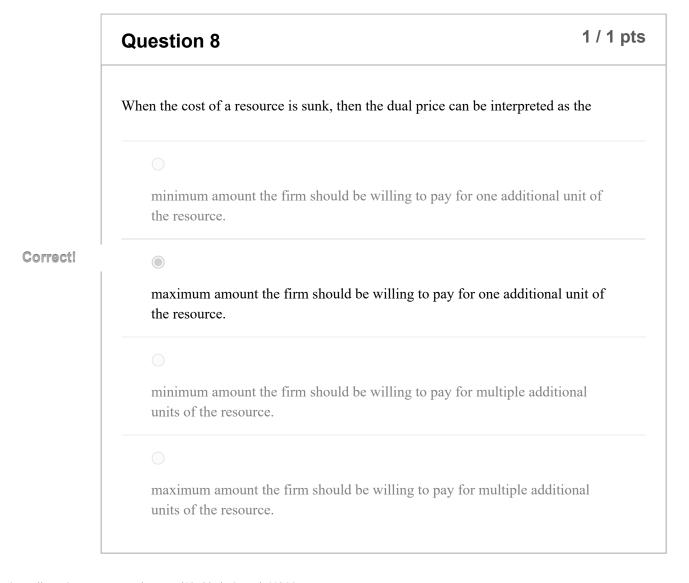
- infeasibility
- feasibility

boundedness		
slack		

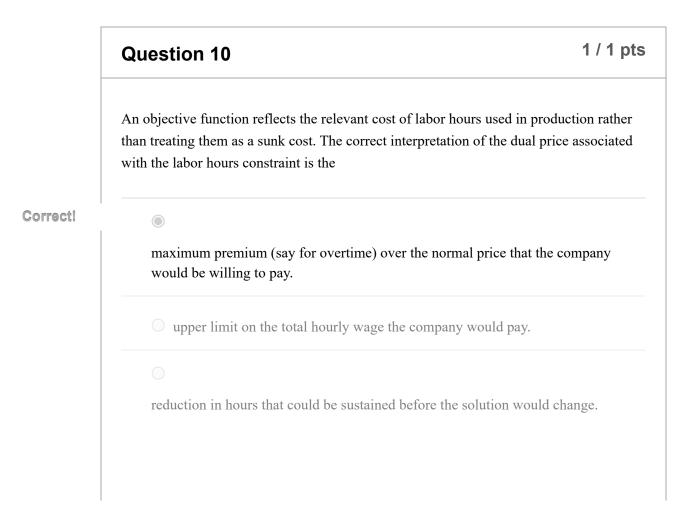
The three assumptions necessary for a linear programming model to be appropriate include all of the following EXCEPT proportionality. additivity. divisibility. normality.

Based on the per-unit increase in the right-hand side of the constraint, the dual price measures the increase in the value of the optimal solution. decrease in the value of the optimal solution. improvement in the value of the optimal solution.

	Question 7	1 / 1 pts
Correct!	The dual price for a \leq constraint will	
	\bigcirc always be ≤ 0 .	
Correct!	always be ≥ 0 .	
	be ≤ 0 in a minimization problem and ≥ 0 in a maximization problem	n.
	always equal 0.	



The range of feasibility measures the right-hand-side values for which the objective function value will not change. the right-hand-side values for which the values of the decision variables will not change. the right-hand-side values for which the dual prices will not change. the total area of the feasible region.



number of hours by which the right-hand side can change before there is a change in the solution point.

Question 11 1 / 1 pts

A grocery store manager must decide how to best present a limited supply of popcorn and soda to its customers. Popcorn can be sold by itself for a profit of \$1.50 per tin. Soda can likewise be sold at a profit of \$2.50 per liter. To increase appeal to customers, one tin of popcorn and a liter of soda can be packaged together and sold for a profit of \$3.00 per bundle. The manager has at most 100 tins of popcorn and 150 liters of soda to make available each day. The manager has decided to stock at least 75 individual tins of popcorn per day (excluding popcorn bundled with soda). Demand for individual liters of soda is at most 140 liters per day (excluding soda bundled with popcorn). The manager wishes to determine how much of each product to stock each day.

What is the maximum daily profit that the grocery store can achieve?

Correct!

\$515\$485\$455\$425

Question 12 1 / 1 pts

A grocery store manager must decide how to best present a limited supply of popcorn and soda to its customers. Popcorn can be sold by itself for a profit of \$1.50 per tin. Soda can likewise be sold at a profit of \$2.50 per liter. To increase appeal to customers, one tin of popcorn and a liter of soda can be packaged together and sold for a profit of \$3.00 per bundle. The manager has at most 100 tins of popcorn and 150 liters of soda to make

available each day. The manager has decided to stock at least 75 individual tins of popcorn per day (excluding popcorn bundled with soda). Demand for individual liters of soda is at most 140 liters per day (excluding soda bundled with popcorn). The manager wishes to determine how much of each product to stock each day.

Which of the following is the constraint that limits the amount of popcorn the store will use (both in bundles and sold separately) each day?

 $P + B \ge 100$

Correct!

Correct!

- P + B ≤ 100
- $P + B \ge 75$
- $P \le 100$

The dual price for a constraint that compares funds used with funds available is 0.058. This means that the cost of additional funds is 5.8%. if more funds can be obtained at a rate of 5.5%, some should be. no more funds are needed.

Question 14

1 / 1 pts

Correct!

	In a production scheduling LP, the demand requirement constraint for a time period takes the form	
	○ Beginning inventory + Production + Ending inventory ≥ Demand.	
Correct!	○ Beginning inventory – Production + Ending inventory = Demand.	
	Beginning inventory + Production – Ending inventory = Demand.	
	○ Beginning inventory – Production – Ending inventory ≥ Demand.	
		_

Arcs in a transshipment problem must connect every node to a transshipment node.

Correct!

represent the cost of shipments	5.
indicate the direction of the flo	ow.
represent the revenue from ship	pments.

Which of the following is true regarding the linear programming formulation of a transportation problem? The objective function value is either 0 or 1. The number of variables is calculated as number of origins times number of destinations. The number of constraints is calculated as number of origins times number of destinations. The constraints' left-hand-side coefficients are less than zero.

Which of the following is a characteristic of assignment problems? The objective function value is either 0 or 1. The RHS of all constraints is less than 0.

orrect Answer

ou Answered

	The value	of all	decision	variables	is either	0 or 1
/	The value	з он ан	decision	variables	is either	or i

The signs of constraints are always \leq .

Question 19 1 / 1 pts

A manufacturing firm has three plants and wants to find the most efficient means of meeting the requirements of its four customers. How many arcs will the network have?

- 4
- 7

Correct!

- 12
- 15

Question 20 1 / 1 pts

A firm has 4 plants that produce widgets. Plants A, B, and C can each produce 100 widgets per day. Plant D can produce 50 widgets per day. Each day, the widgets produced in the plants must be shipped to satisfy the demand of 3 customers. Customer 1 requires 75 units per day, customer 2 requires 100 units per day, and customer 3 requires 175 units per day. The shipping costs for each possible route are shown in the table below:

Shipping Costs per unit at Plant	Customer 1	Customer 2	Customer 3
A	\$25	\$35	\$15
В	\$20	\$30	\$40

С	\$40	\$35	\$20
D	\$15	\$20	\$25

The firm needs to satisfy all demand each day but would like to minimize the total costs.

The objective function for the firm's problem will have how many terms?

- 5
- 7
- 0 10

Correct!

Correct!

12

In a transshipment problem, shipments cannot occur between two origin nodes. cannot occur between an origin node and a destination node. cannot occur between a transshipment node and a destination node. can occur between any two nodes.

Question 22 1 / 1 pts

Assuming W_1 , W_2 , and W_3 are 0-1 integer variables, the constraint $W_1 + W_2 + W_3 \le 1$ is often called a

multiple-choice constraint.

Correct!

- mutually exclusive constraint.
- k out of n alternatives constraint.
- ocorequisite constraint.

Question 23

0 / 1 pts

In a problem, 1 corresponds to a yes decision and 0 to a no decision. If project X can be undertaken only if project Y is also undertaken, then the following constraint needs to be added to the formulation:

- $X + Y \le 1$
- X + Y = 1

orrect Answer

 $X \leq Y$

ou Answered

 \bigcirc $Y \leq X$

Question 24

1 / 1 pts

In a problem with 3 mutually exclusive alternatives, A, B, and C, the following constraint needs to be added to the formulation:

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Correct!

$$\bigcirc$$
 A + B + C \leq 1

$$A + B + C = 1$$

$$A - B - C \le 1$$

$$A - B - C = 1$$

Question 25 1 / 1 pts

If the acceptance of project A is conditional on the acceptance of project B, and vice versa, the appropriate constraint to use is a

- multiple-choice constraint.
- \bigcirc k out of n alternatives constraint.
- mutually exclusive constraint.

Correct!

o corequisite constraint.

Question 26 1 / 1 pts

The solution to the LP Relaxation of a maximization integer linear program provides a(n)

- upper bound for the value of the objective function.
- O lower bound for the value of the objective function.
- upper bound for the value of the decision variables.

O lower bound for the value of the decision variables.

Question 27

1 / 1 pts

In a problem, 1 corresponds to a yes decision and 0 to a no decision. If there are 4 projects under consideration (A, B, C, and D) and at most 2 can be chosen, then the following constraint needs to be added to the formulation:

 $\bigcirc A + B + C + D \le 1$

Correct!

- $A+B+C+D \le 2$
- \bigcirc A+B+C+D \leq 4
- A + B + C + D = 2

Question 28

0 / 1 pts

A cell phone manufacturer is preparing its inventory and production schedule. A key element is installing a SIM card into each phone. Demand has been averaging 210 cards per week. Holding costs are \$0.01 per card per week, and reorder costs are estimated at \$10 per order.

The manufacturer does not want to be out of stock on more than 1% of their orders. There is a one-day delivery time. The standard deviation of demand is five cards per day. Assume a normal distribution of demand during lead time and a seven-day work week. What is the total variable weekly cost including safety stock cost?

orrect Answer

- \$6.60
- \$7.50

ou Answered

Correct!

9.40

\$8.00

Inventory position is the amount of inventory

on hand in excess of expected demand.

on hand.

on hand plus the amount of inventory on order.

on hand minus the expected demand.

Question 30

1 / 1 pts

In the single-period inventory model with probabilistic demand,

- surplus items are not allowed to be carried in future inventory.
- $c_o = c_u$.

- probabilities are used to calculate expected losses.
- all of these are correct.

0 / 1 pts **Question 31** For the EOQ model, which of the following relationships is correct? orrect Answer As the order quantity increases, the number of orders placed annually decreases. • As the order quantity increases, annual holding cost remains constant. ou Answered As the order quantity increases, annual ordering cost increases. • As the order quantity increases, average inventory remains constant. 1 / 1 pts **Question 32** A firm that is presently using the economic order quantity model and is planning to switch to the economic production lot size model can expect Correct! • the Q* to increase. the maximum inventory level to increase. the order cycle to decrease.

Question 33 1 / 1 pts

The objective of the EOQ with quantity discounts model is to

annual holding cost to be less than annual setup cost.

O 0.0988

Question 35

0 / 1 pts

If arrivals occur according to the Poisson distribution every 20 minutes, then which of the following is true? $\lambda = 20 \text{ arrivals per hour}$ orrect Answer $\lambda = 3 \text{ arrivals per hour}$

ou Answered

 $\lambda = 20$ arrivals per day

	Question 37 1 / 1 pts	i
	The time to check in a guest at a New York City hotel follows the exponential distribution and has a mean of six minutes. What is the probability of a registration time shorter than six minutes?	
	0.3935	
Correct!	0.6321	
	0.2386	
	0.0988	

Single-booth ticket sales at a theater are an example of which of the following queuing models? Single-server, Poisson service rate distribution, unlimited queue length Single-server, Poisson service rate distribution, limited queue length Single-server, constant service rate distribution, unlimited queue length Single-server, normal service rate distribution, unlimited queue length

Which of the following queue disciplines is assumed by the waiting line models presented in the textbook? First-come, first-served Last-in, first-out Shortest processing, time first First-in, last-out

Question 40 0 / 1 pts

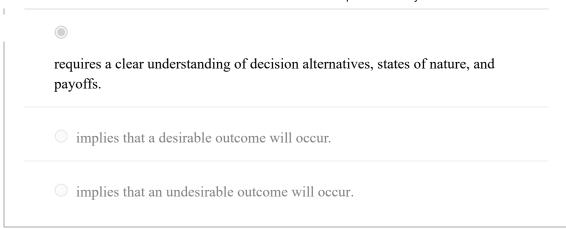
	Which of the following approaches to decision making requires knowledge of the probabilities of the states of nature?
	minimax regret
ou Answered	maximin
orrect Answer	 expected value
	conservative
	Question 41 1 / 1 pts
	Decision tree probabilities are primarily used to
Correct!	
	analyze more complex problems and to identify an optimal sequence of decisions.
	analyze less complex problems while identifying the optimal sequence of decisions.
	find overlooked choices to the problem.
	assign probabilities to events.
L	

Question 42 A decision tree

	presents all decision alternatives first and follows them with all states of nature.
	presents all states of nature first and follows them with all decision alternatives.
	alternates the decision alternatives and states of nature.
Correct!	arranges decision alternatives and states of nature in their natural chronological order.

Correct! The options from which a decision maker chooses a course of action are called the decision alternatives. not under the control of the decision maker. the same as the states of nature. uncertain events determined by probability.

Question 44	1 / 1 pts
Making a good decision	
or requires probabilities for all states of nature.	



	Question 45	/ 1 pts
	For a minimization problem, the conservative approach is often referred to as the	
Correct!	minimax approach.	
	maximin approach.	
	maximax approach.	
	minimin approach.	