Question 1

Answer saved

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Remove flag

A company will be able to obtain a quantity discount on component parts for its four products, X_1, X_2, X_3 and X_4, if it produces beyond certain limits. To get the X1 discount it must produce more than 50 X_1's. It must produce more than 60 X_2's for the X_2 discount, 70 X_3's for the X_3 discount and 80 X_4's for the X_4 discount. How many binary variables are required in the formulation of this problem?

- a. 2
- b. 8
- c. 4
- d. 12

Clear my choice

Question 2

Answer saved

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Remove flag

A company is developing its weekly production plan. The company produces two products, A and B, which are processed in two departments. Setting up each batch of A requires $90 of labour while setting up a batch of B costs $60. Each unit of A generates a profit of $30 while a unit of B earns a profit of $25. The company can sell all the units it produces. The data for the problem are summarized below.

	Hours required by		
Operation	A	B	Hours
Cutting	5	4	92
Welding	4	1	48

The decision variables are defined as:

Xi = the amount of product i produced (where X_1 = Product A, X_2 = Product B)
Yi = 1 if Xi > 0 and 0 if Xi = 0

What is the appropriate value for M_2 in the linking constraint for product B?

- a. 48
- b. 4
- c. 1
- d. 23

Clear my choice

Question 3

Answer saved

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Remove flag

A company will be able to obtain a quantity discount on component parts for its four products, X_1, X_2, X_3 and X_4, if it produces beyond certain limits. To get the X1 discount it must produce more than 50 X_1's. It must produce more than 60 X_2's for the X_2 discount, 70 X_3's for the X_3 discount and 80 X_4's for the X_4 discount. How many decision variables are required in the formulation of this problem?

- a. 16
- b. 12
- c. 4
- d. 8

Clear my choice

Question 4

Answer saved

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Flag question

A company is developing its weekly production plan. The company produces two products, A and B, which are processed in two departments. Setting up each batch of A requires $50 of labour while setting up a batch of B costs $70. Each unit of A generates a profit of $17 while a unit of B earns a profit of $21. The company can sell all the units it produces.

The decision variables are defined as:

Xi = the amount of product i produced (where X_1 = Product A, X_2 = Product B)
Yi = 1 if Xi > 0 and 0 if Xi = 0

What is the objective function for this problem?

- a. MAX: 17 X_1 + 21 X_2 - 50 Y_1 - 70 Y_2
- b. MIN: 33 Y_1 + 49 Y_2
- c. MIN: 17 X_1 + 21 X_2 - 50 Y_1 - 70 Y_2
- d. MAX: 33 X_1 + 49 X_2

Clear my choice

Question 5

Answer saved

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Flag question

An ILP problem has 6 binary decision variables. How many possible integer solutions are there to this problem?

- a. 6
- b. 32
- c. 12
- d. 64

Clear my choice

Question 6

Answer saved

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Flag question

One approach to solving integer programming problems is to ignore the integrality conditions and solve the problem with continuous decision variables. This is referred to as:

a. quickest solution method.

b. LP satisficing.

c. LP approximation.

d. LP relaxation.

Clear my choice

Question 7

Answer saved

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Flag question

For minimization problems, the optimal objective function value to the LP relaxation provides what for the optimal objective function value of the ILP problem?

a. A lower bound.

b. An alternative optimal solution.

c. An additional constraint for the ILP problem.

d. An upper bound.

Clear my choice

Question 8

Answer saved

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Flag question

A production company wants to ensure that if Product 2 is produced, production of Product 2 not exceed production of Product 1. Which of the following constraints enforce this condition?

a. $X_2 \leq X_1$

b. $X_2 \leq M_2Y_2$, $X_2 \leq Y_2X_1$

c. $X_2 \leq M_2X_1$

d. $X_2 \geq M_2Y_2$

Clear my choice