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Question: The Goodwin Company drills offshore oil wells under contract t...

The Goodwin Company drills offshore oil wells under contract to large oil companies. The company's owner, Jim Goodwin, needs to find an effective way of blending a liquid solution which will provide a non-corrosive storage medium for the company's tungsten carbide drill bits. He has found through some experimentation that two reagents – Algine and Benedroll – when properly blended, will provide an effective solution. One liter of the solution mix must contain at least 0.2 liter, but no more than 0.6 liter of Algine. The amount of Benedroll in the one-liter mix must be between 0.2 and 0.6 liter. Jim can obtain the required amount of reagents in the mix by blending some amount of Yeltzflux and Zinderfud into a low-cost chemically inert solvent. Yeltzflux is a readily obtained commercial product costing \$2.25 per liter; each liter of Yeltzflux contains 0.4-liter Algine and 0.5-liter Benedroll along with other ingredients. Zinderfud is also readily available for \$2.38 per liter, and it contains 0.7-liter Algine and 0.4-liter Benedroll. How much Yeltzflux and Zinderfud to put in a one-liter blend of storage solution so the final blend contains the proper levels of reagents at the minimum cost.

Expert Answer


 Anonymous answered this
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Let the quantities of Yeltzflux and Zinderfud to put in a one-liter blend of storage solution be x and y respectively.

The objective is to minimize total cost. Hence, the objective function is:

$$\text{Minimize } Z = 2.25x + 2.38y$$

Subject to the constraints:

1) One liter of the solution mix must contain at least 0.2 liter, but no more than 0.6 liter of Algine:

$$0.2 \leq 0.4x + 0.7y \leq 0.6$$

2) The amount of Benedroll in the one-liter mix must be between 0.2 and 0.6 liter:

$$0.2 \leq 0.5x + 0.4y \leq 0.6$$

3) Total volume is 1 liter

$$x + y = 1$$

4) Non-negativity:

$$x, y \geq 0$$

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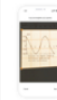
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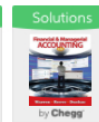
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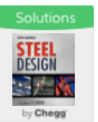
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Analyze each problem and show your solutions in an orderly manner. 1. Mutual funds for ABC Company have Php500,000 available for one of the three investment alternatives in the stock market: a black-chip stock offering, a growth-stock offering, and a venture-stock offering. The environment of the investment can assume any of the three future events, and ABC has no information about the response of the market. The payoff table of ABC Company is presented below:

The trend in the market	Stock type
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