Assignment_ 2. Linear programming.

Solution 1:-

Given the following information; Back savers manufactures two types of bags using nylon, and the available nylon each week Meanners number of 1th tags: 0 = 11 & 5,000 Square feet

Subject to:

(1) Collegiate Bags : xxxxx 200 200 and and ald allary 1640)

> Nylon requirement: 3 square feet per bag.

Sold per week : 1,000 Units 1 1230 mattern 211 , 2110

production time: 45 minutes per bagi.

> profit per bag: \$32; 008 = 7 of to be of

(a) Mini Bags :-

r Nylon requirement: 2 square feet per bag.

Y sold per week: 1200 units.

rproduction time: 40 minutes per bag.

y profit per bag: \$24.

Labor details:

, Number of workers: 35

y weekly working hours per worker: 40

r Total weekly Labor hours: 1400.

Decision Variables :- Let

> I represente the objective function, which is the total profit. *C represente the numbers of collegiate bags produced.

YM represents the numbers of Mini bags produced.

The Objective is to Mazimize the total profit, defined as, Z = 32C + 24 M.

with,

CZO and MYO.

Constraints:-

+ Available nylon per week: 3c+ aM = 5000

> Maximum number of collegiate bags: 0 £ C < 1000

dinens parguaration.

* Maximum number of Mini bags: 0 < M < 1200

> Total Available Labor hours per week: 3 c + 2 M Z 1400

Thus, the mathematical model to mazimize profit subject to constrainte is;

Marinize = 32c tayy

Subject to:

3C+2M < 5000, \frac{3}{4}C+\frac{3}{3}M < 1400, 0 \le C \le 1000, \quad \le C \le 1000,

* Production time 3 to minutes per bag * profit per bag : \$24.

Propos executly.

- Nameu of workers: 35 y weekly working hours per worker: 40 Total weekly tabox hours: 1400.

Delleron Variables to Let

of represente the objective function, which is the total profit of nepresente the numbers of collegiouse sings produced on the numbers of which buy produced.

The coperties is to Appalating the total stayle, defined as

saith

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Solution 2: The throngs one ben

-A Company operates three branch plants of different sizes (Karge, medicin, small) with the following data:

> * profit per unit; \$420 (Large), \$360 (medium), \$300 (Small)

> Excess capacity: 750 units (range), 900 units (medium), 450 units (small)

r In-storage space: 13,000 square feet (Large), 12000, Square feet (medium), 5,000 square 2000 + 15 m + 15 mall + 15 000 feet (small) + mg = + 15000

> Space per unit produced: 20 square feet (Karge). 15 square feet (medium), 12 Square feet (small).

Sales forecasts: 900 units (Karge), 1200 units (medium), The Company on Chamed to Ensure that each point (01) each

Decision Variables: - Let egentanten some sit englishe tadiq

7 Pil, Pim, and Pis represent the number of Large, medium, and small units produced by plant i.

(Where & = 1,2,3 corresponds to the large, medium and small plants).

of production:

objective function: The goal is to maximize profit by producing the correct number of units in leach plant

> Z = 420 (Pil+ Pal+Pal) + 360 (Pim+Pam+Pam)+ 300(Pis + Pas + Bs)

Where 420, 360 and 300 represent the profit per unit for each plant Size. fraxaci me silcen, small ; with the of Howing

Constraints 500 008 7 (1900 0 00) : 1 300 209 39295

> production Limits (man) 008%

(mulborn) Pic + Pac + Pac + Pac = 750; " OFF: Wing as some Pim + Pam + Pam & 900, ~ 100001 Pista Pas 1 450 000 square 1 30002 aparass 10000.

, storage capacity constraints; 20 Pict 15Pim + 12 Pis = 13000, 20 Pal + 15 Pam + 12 Pis = 12000, (30 20 P3 c+ 15 P3m + 12 P35 < 5000,000 30 3000 200 3000

. Sales forecasts:

Pil+Pal+Pal + Pal = 900, Pint Pant Pam = 1200, Pist Past = 750

The Company has decided to ensure that each point (or) each plant utilizes the Same percentage of it's eacess capacity of production:

Training Pil + Pim + Pis assay Par + Pam + Passay Josephane 900.

The Linear programming model is:

Marinize = 420 (PIL+PaL+Pac) + 360 (PIM + Pam + Pam) +300 (PIS+

Subject to the Constraints mentioned above.

Z = 420 (Pit + Pat + Pat) + 360 (Pim + Pam + Pam)+ 300[Pis + Pas + 135)