All let x, be the not units of type A bett to be maged X2 be the not with of type is belt to be which

> Max; - 4×1+3×2=2 ST:- 2x1+x2 < 1000 (time) ×1+×2 < 800 (leather) $1 \le 400$ (Buckle type 1) ×2 < 700 (Buckle Ingle 2) メルタプロ

color of asion of as posts.

Qualitative Description

A Gompany manufactures two vooriety of leather bets. At B. The unit profit hompany realises by selling one unit of belt \$ is Rs 4 and Rs. 3 respectively tach unit of belt A requires a unique buckle, maximum of the same are available. Each unit of bett B requires a buckle, the maximum supply available for the same is 700 units. The belts is manufactured in a common production process that shares labour and leather. Each unit of belt A requires 2 units of labour 4 one unit of leather, while each unit of belt is requires one unit of labour & one unit of leather. The maximum supply of labour & leather are 1000 unts 4 800 units respectively. Formulate the problem to Maximize profits.

(1.5 marks)

912

(9)

RHS Sensitivity analysis of Machine hours Slack variable supresenting machine hours = 53 original Presource value = 52

| 0,* | 53* | tve ratio | -ve ratio LB = 52 - 4 = 48 |
|-----|------|-----------|---|
| 11 | -114 | - | -44 UB= 52+4=56 -4 permissible decreax=4 has |
| 8 | -2 | 7 | The maintenence people can take |
| ٦ | 1/2 | 4 | - 4 hours to repain the MIC. |

(ors mark)

(b)

slack variable that representing Labour 52 original resovate value = 40

$$\frac{9^{*}}{1} \quad \frac{52^{*}}{0} \quad \frac{\text{tre ratio}}{10} \quad -\frac{\text{ve ratio}}{10} \quad \frac{-\text{ve ratio}}{10} \quad \frac{1}{10} \quad \frac{$$

LB = 40-8= 32

permissible decrease = 8 hrs one day off can be given to workers

C1.5 Marks)

: All g-Zj values are either 0 or -ve, the Solution is optimal (02 Maries)

8.15

Slack variable representing Raw material >> SI

Lower bound = 2500-175 = 2325 Upper bound = 60

(1.5 Marks)

No of units to be scrapped = 500

Attunate available from regular vendor = 200

Net shortage of RM = 500-200

= 300

*

Permissible decreas= 175

the pre determined production plan = 125 units

(1.5 marks)

814

Let x, be the no of units of product A to be Maged

X2 be the no of units of product B to be maged

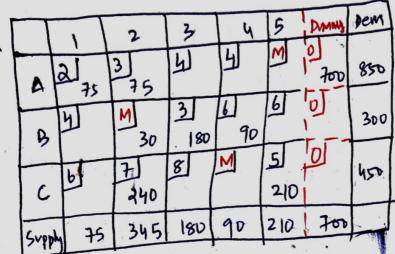
X3 be the no of units of product C to be maged

Max: $Z = 90 \times 1 + 40 \times 2 + 30 \times 3$ 5.T: $6 \times 1 + 5 \times 2 + 2 \times 3 \le 5000 \text{ (RM P)}$ $4 \times 1 + 7 \times 2 + 3 \times 3 \le 6000 \text{ (RM P)}$ $\times 1 + \frac{1}{3} \times \frac{1}{3} \le 1600 \text{ (MF)} \text{ fine)}$ $\times 1 \times 2 \times 3 = 31415$; $\frac{1}{3} = \frac{1}{4}$

 $x_{1}, x_{2}, x_{3} = 3i4i5; \frac{x_{1}}{3} = \frac{x_{1}}{4}; \frac{x_{2}}{4} = \frac{x_{3}}{5} \Rightarrow \frac{4x_{1}-3x_{2}=0}{5x_{2}-4x_{3}=0}$ $x_{1}, x_{2}, x_{3} = 3i4i5; \frac{x_{1}}{3} = \frac{x_{2}}{4}; \frac{x_{2}}{4} = \frac{x_{3}}{5} \Rightarrow \frac{4x_{1}-3x_{2}=0}{5x_{2}-4x_{3}=0}$

x,1x2, x3 >0 (3

(3 marks)



M+n-1= 8 - solution is non degenerate

(Formulation & generation of basic feasible Solution 3 marks)

617

optimizing the above solution

II transportation table

M+n-1=8 Sol7 is non-degenerate.

III - transportation table

7=3315

m+n-1=8, Soln is non-degenerate

(OI MATIC)

(ol mark)

Final transportation table

| able | 5 Jammy sem |
|-----------------------------|---------------|
| 1 2 3 190 | M 0 310 850 |
| A 23 75 23 45 1 74 6 1 80 C | 6 20 300 |
| 6 7 8 0 | 210 240 450 |
| 54 H 14 19 90 | 210 700 |

2=3135

Solution is ophimy (DZ Marks)