11	January	2021
-	0	

En-

En-2.3.4 (Pg 40)

Ne produce 2 Products

	L) P, and P2 Materials (parlb)						
1	Process.	Labour (bes hy)	A	13	Pi	PZ	
	A house	20 000	160	30	35	55	1
	2	30	100	35	45	42	The second second
	3	10	200	60	70	0	
1	4	25	75	80	0	90	-

Prod. rey. Atleast 2100 units of PI 1800 11 11 PZ

A: man 4 tons = 8000 lb B: 11 2 11 = 4000 lb

lobour = 1000m

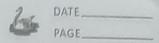
Biu: A: 3/14

B : 7/26

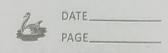
Variables: n, n2, n3, n4 = no. of hyweek of process 1, 2, 3, 4.

Objective gr

Minimire Z = (160 n, + 100 n2 + 200 n3 + 75 nu) x3 + (30n1 + 35 n2 + 60 n3 + 80 nu) x7

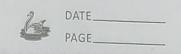


> Min Z = 690 mi + 545 m2 + 1020 mg + 785mg Canst szints 35m + 45 m2 + 70 m3 7,2100 55n1 + 42n2 + 90n4 >, 1800 160 n, + 100m2 + 200 m3 +75 ny 58000 Bon1 + 35n2 + 60n3 + 80n4 & 4000 20m + 30 m2 + 10m3 + 25my 5 1000 n1, n2, n3, n4 >0 This is the UP Model for Problem I or part I (when no occurtime is used) Part-II Questime: Man 200 m, with additional saleny At 160 74 5100 mosts copy 121 30 h Introduce new variable no G no of hours of orestime Constraint added Minimize 5n Objective gn Z = (same) + 30 ns Constraints Subjecte to PI: , Same as A: (fisst 4) Labor: 20 ni + 30 nz + 10 n3 + 25 mg < 1000 100s 25 6 200 n, m, n3, n4, n5 70

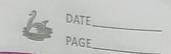


Standard form =, >, = 2 Any LPP model worth these signs can be comenta to Standard form. Min. 2 the fin (min 7) = (1n1 + c2 n2 + - - - + (nnn - co Subjected to anni+ -- - + annn= b, 77, € is convotes to= - - + amnnn = bm Jslgn amin, + ni >0 / i=1--- has delicores our se Grample for standard form man 2 = (17) + --- cnnn =) min z = - (cini+ - - + cinnn). For insquality with & rad (+ m) on Min 2 = n, 12n2 + 3 n3 Subject to n1 + n2 + n3 510 n1-n2 >5 ni > 0, i = 1, 2, 3Offset uneck if Z (on obj. 5") is minimum - tune it is min (2) Convert Constraints into Z $n \leq q$ n + n' = q· W 16 = 10 Is Introduce new ble

Surplus numbers on Slag variables one introduced in >> < to make it =
surplus recorded in 71 < to make it =
milacilla at
11.
1ly
n>p
m-n'= p
$n_1 + n_3 + n_5 = 10$ $n_1 + n_2 + n_3 + n_4 = 10$
$n_1 + n_3 + n_3 \le 10$ becomes $n_1 + n_3 + n_4 = 10$
n1-n2 715 becomes
- httl
11 - n2 - 13 - 3
So new Constraints are
n ₁ 1 n ₂ + n ₃ + n ₄ = 10
$n_1 + n_2 + n_3 + n_4 = 10$ $n_1 - n_2 - n_5 = 5$
01 1 1/0.10 10
6 Fer inequality with 5, add (+n') on
$US, \leq \rightarrow =, n'>0$
Fren ineq. with 7, add (-n') on LMS
$1 \rightarrow 2 \rightarrow $
1. 1. 4.01
then we restrict to.
then we restrict it.
Any no ceus he converted its into a diffice
Any no ceus be converted in into a diffuer of any two negative numbers.



If one variable is unrestricted, we enpress it as n= n'-n" / n', n' 7,0 Artificial Variables Man Z = 3n, -2n2 - n3 +ny -87 weith constraints 4n1-n21ny ≤ 6 -7n, +8n2 + n3 >, 7 n, +n2 + 4ny = 12 mi, nz, m3 70 my is unrestricted Sol Convert to Stundard Form 1 Convert to Minimum Min Z = - (Man Z) = - (3n1-2n2-n3+n4-87) 2 - 3n, + 2n2 +n3 -n4 187 Constraints: 4n, -nz tny +n5 = 6 -7n, +8n2 +n3 -n6 = 7 n1+n2+4ny=12 Commented to Stendard Frm As my is I constricted ny = ny'-ny" ny' >0 4n, -nz + (nu' - nu") 125 = 6 - 7n, 18n2 1n3 -n6=7 n1 1 n2 + 4 (nu - ny") = 12 Min Z = -3n1 +2n2 +n3 - (nu'-ny") +87)



011, 12, 013,	774	, ny " ,	75,	ne	>10

Eg. Solving for CPP model (finding frasible region)

 $n_1 + 2n_2 + n_3 = 4$ $2m_1 + 2n_2 + 3n_3 = 7$ $m_1 + n_2 + 4m_3 = 6$ 3 Pivoting

Diagonal element is 1 & values

about it & below it should

be converted to 0

(D) 2 150	4
223	7
1114	6

R2 -> R2 - 2R1 R3 -> R3 -R1

	31	2	THE	4
1	0	(=2)	c)	1-5-4 10
	0	-1	3	2

R2 -> - R2

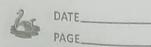
	1	2	1	1 1
	0	1	-1/2	1/2
-	0	-1	3	12

R3 -> R3 +R2

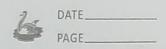
1	2	1 3	4 5
0	1	-112 \$	1/2
L 0	0	\$/2	5/2

Cold Patherine	PAGE
$R_1 \rightarrow R_1 - 2R$	
1 0 2	.13
0 1 7/2	1/2
0 0 (5/2)	5/2
	Land Mark Basic
R3 -> 2/5 R3	
ious erample	and self presidence is
2 3	July Thouse
0 1 -1/2 5	- 1/2
[0015	1
9	1
$R_1 \rightarrow R_1 - 2R_3$	
$R_2 \rightarrow R_2 + L R_3$	- EH3-5 - EH3 +
V	
100	ER 11 -1 - 51 - 31 -
0 1 0	1 2
001	1
6 Any pivot can be	considered
	THE HATTER TO THE
Eg: n1+ n2+2n3.	174 30
372 + 73 + 87	14 = 3 - pac, packed
The notice to the	3.100
Pivoting	1221
n1+ +5/3 n3 -	5/374 = 5
(1 n2 + 1/3 n3 +	8/3 74=1
Basic Variables	
ni & nz ? Pivots	- Cannonical form
all live in the sale	15 19 705

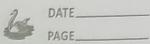
Sol" is not Unique 3 Infinitely Many



			PAGI		
form after Pi	10ting ->	Canonical f	om'		
Standard Form	rs -> Co	unonical fo	m	0	
And Basic 7	1818	(6/3)		9	
Feasible Basic		9			
	4.33	· R3			1
So continuing	per per	evious enan	nple		
Basic	Variables	$= n_1, n_2$ $= n_3, n_4$	3 A	s they	y can
Non 11	71-11	= n3, n9	1	beca	huerta
			L	n can	nonital
	-	E	11/00	gorn	718
		- 283	10 -	R1 -	
Tantake n1 = 5	-5m3 -	+5 my	E2) a	- 7 7	
Talit	3	3			
Value L nz =	1-1 n3	-8 ny	0	1	
(m1, m2)	3	3	1	0	
	1				
There are infinitely many sol", we take					
one arbita	y solm	O		V	
	9 = MK	F 542+ 3	4 1-1	The same	0.1
Led ng, ny	= 0	Mg + 500	4 54	8	N
n1=5		7 Ponti	ular	sol	
m2=1				GNI	Pivot
. 5	a 64. Els	92 M3 - S	3 +	+	110
One Pantiular	Value -	-> Check =	2 4	Repla	t until
				man	· ur
JF (5,1,	0,0)7	· di	ic. Lea	min	. 4
	solh of	system of var	ichler	ach	12400
/ m1, m2, x	13, my >	igsten of var		Lore	
	Buildo				
	THE STATE OF THE S	Control Contro			



Steps
D Standard form
2) Comonical from (Pivoting)
3) Non Busic = 0 2 Basic Soln
2) Canonical form (Pivoting) 3) Non Basic = 0 & Basic Sala Basic = PMS Value
Y) If it satisfis non-negativity condition, then it is feasible basic sol
then it is fearible basic sol"
- Mayor & Bank Variable
O = er / re
I) We can have many basic variables
I) We can have many basic variables I) Basic variables may be frasible or non-frasible
- 1 1/2 stend of AT
"low hand for the best of times &"
Let thouse n, & my as pivol elements in previous
enamples.
So a ser was be been but of present be
$n_1 + 5 n_2 + 15 n_3 = 45$
8 8
$\frac{3n_2+1n_3+n_4=3}{2}$
8 8
Basic; ni, ny
Let nz, nz = 0 Banic Feasible
n= 45/8 7 Solm
ny = 3/8 (Non-negadivity
n, 7,0, ny 7,0 (condition)
$(\frac{45}{8}, 0, 0, \frac{3}{8})$



	PAGE
Now,	
ny, no as pivot	element
	Side and A. Francis C. March 1988 1988 1988 1988
8n1+n2+3	n3 = 9
	L 1000 1 2 1 3 1 1 1 1 1 1
一つろかりセール	3 + ny = -3
5	13 Want to be not
nz, ny Z Banic	Vaniables
n1, n3 = 0	
2=9 0	Non-negativity not satisfie
24=-3	Non-negativity not satisfic so, it is not feasible basic sech
	It is basic sol"
9	It is basic Sol" Com't be Used for Optimal Sol"
	Let write my & my car private allow
	Many Co.
So, a sol " com be!	basic but it need not be
frasible bosic so	of "[Non-negativity sol"]
	8
	E= PN + SNI + SNI
	6 6
	Plant Conjon
Start of the Start	List Top are to the
185	015H = 140
photopin - ms (A)	2/8 = pre
(Card Direct	LOCKE OF 18 SHALL