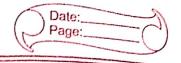
Jame:	Mond. Manzas Ighal
wolar	, 192120017 Date:
granel	- m c4
000	Mid-Term Exam
	Mig + Carre Distant
	MCA-62L
	(Q.4)
	$Maz Z = 7x_1^2 + 6x_1 + 5x_2^2$
	Subject to 2x + 2 25, 2, 2, 20
	118's lagre variable 2
	Using lagrange variable 2, 24 + 2 = 5 = C1 (lef)
	24 Th 1/1 = 3
	2 2 2
	$(9) \frac{\partial z}{\partial x_i} + \frac{\lambda_i}{\partial x_i} \frac{\partial c_i}{\partial x_i} - 0$
	$12 K_{14} + G + A_{1}(2) = 0 - (2)$
	$\frac{1.6 R_{14} + G + A_{1}(2)}{G_{12} + A_{1}(1) = 0} $
	G7 + 1, co
	(b) $\lambda ig_{i}^{\circ} = 0 \Rightarrow \lambda (2x_{1} + x_{2} - 5) = 0$
	(b) Aigio = 0 7 /(24/1/25)
	(3) (1) (3)
	(d) 2:70 7 2:70 6
	from (4) either . (1; =0) in 221+22-5=0
	[case-] when 1, =0 case-4
	hom- C) Ax, + 6=0 when 2y+h-
	rom-G 47 No need to consider
	from 3 62 = 0 21 22 =0
	so hence the solution is = [-6/14,0]



(P.1) Simplex Helhod

Max Z = $7x_1 + x_2 + 27_3$ Subject to $24 + 2 - 27_3 \le 10$, $9x_1 + x_2 + x_3 \le 20$ $2x_1, x_2, x_3 > 0$

Mar $z = 7x_1 + x_2 + 2x_3 + 0s_1 + 0s_2$ Subject to

4xy + 2 + 73 + 04 + 52 = 20

	4-1	C:	7	1.	2	0	, 0	
			+ + + + + + + + + + + + + + + + + + + +			e	0	Minhatio
		Nep	24	22	7/3	121	S ₂	
B	CB	- 6						
						-		10/1=10
		10		of L	-2		0	191=10
Sı	0	10	1			U	1	20/ €5
		0.5	14	18	1	1.000		79
S	0	20				0	D	
		ZÝ	, 0	0	0			
•	2		_71	-1	100	0	0	
	200	Z; - Zj			1	1	'	
	-3				1 1 1 1 1 1	£ 8		
l		at not						

Negative minimum Zj-gi is -7 and its column inder is 1. so entering variable is 2.

Min satio is 5 and its now index is 2. So learning variable is S?



Entering	= 74	, Der	arting	= 6.
key e	lement	1	Ů	

Ry (new) = Ry (old) + 4 Ry (new) = Ry (old) - Ry (new)

Steration - 2 9' 7 1 2 0 0

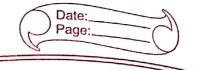
В	Ca	XB	74	82	70	. S,	52	Min
								ردار رفعا
3, 1)	0	5	0	0.75	-2.25	1	-0.25	
-		- " F	6 -	Ž.				
24	7	5	1	0.25	0.25	0	0.25	5/0.25=20
<i>a</i> . 9		1-	6		1			/
ly .		2j-9	0	0.75	-0.2	5 0	1.33	

Negative minimum Zj-cj is-0.25 and its solumn hider is 3. So entering variable is xz.

and pirot element is [0"25]

R (new) = R cold) = 0.25

Ry cnew) = Ry cold) + 2.25 B cnew)



	ATTACKE, WARE A STREET OF THE STREET	C'		1	2	0	0	
8 1	c _B	1 28	74	an	72	3,	Sz	Minkalio
				1			1	
٠,	0	30	9	3	0	1	2	
λ,	2	20	4		1	0	1 1	
^3		۲,	Ð	2	2	0	2_	
		2; - 9	, , ,	1	0	C	2	
)		,,,,,			

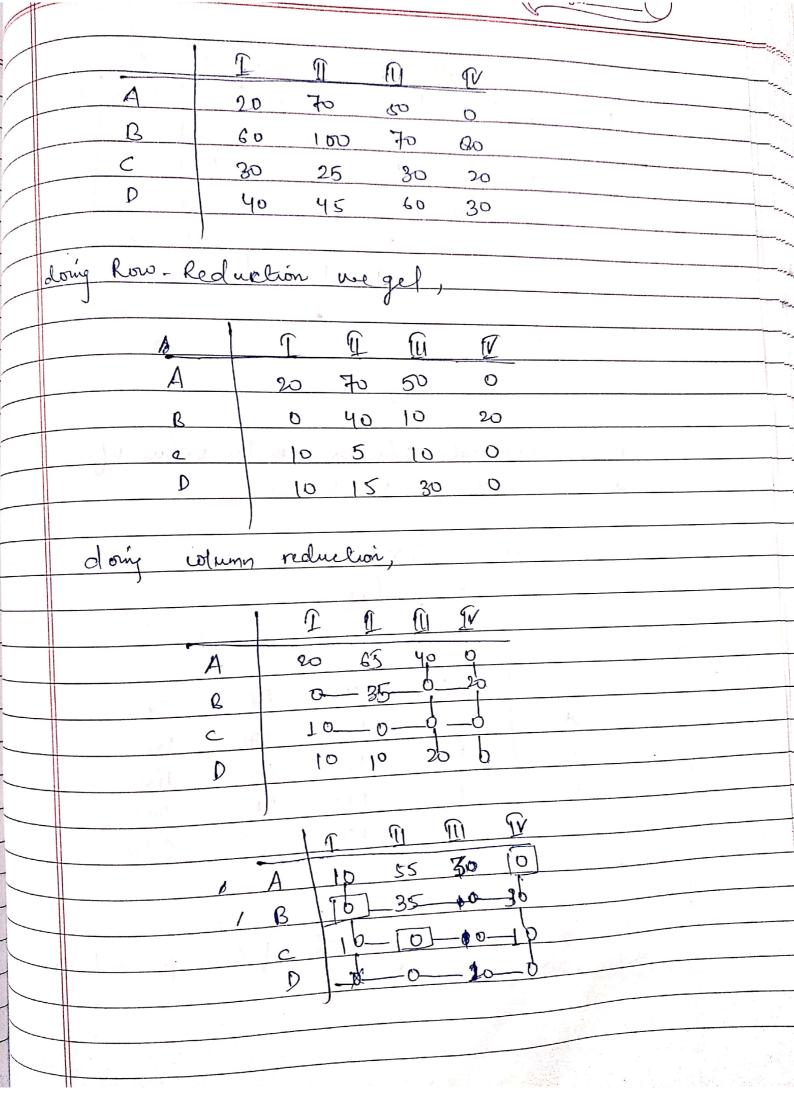
Since all zj-cj > 6

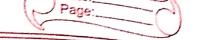
hence optimal solution with value of variables as: 24 20, 25 = 0, 25 = 20

Maaz = 7x0+0+2x20

(Q. 5)		I	· <u>n</u> -	(i)	\mathbb{Q}	
	A	200	150	130	280	
	В	160	1/120	150	140	
	C	190	195	190	250	
	D	180	124	160	190	

are 220 lpg. sale for representative





	1	/ Î	<u> </u>	M		T T	Ī o	
A	0)	45	30	/ 0	A	0 4	20	TY.
В	0	25	[6]	2 °	B	10 3	५ हत	10)
C	20	(0)	10	20		20	in	10
D	0	Ø	20	0	D	1.0		20_
						1	10	D_

So the optimen assignment is

 $\begin{array}{ccc} A \rightarrow & \text{IV} \\ B \rightarrow & \text{B} & \text{I} \end{array}$

c -) 11

D -> @ [

total maximum bales increas per month

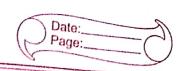
= 2200 + 160 + 190 + 120 175

= 1745

(5)(6):

	1	1	$\widehat{\Pi}$	[V]
Δ	250	160	170	220
B	11160 "	120	-	140
c	190	195	190	200
D	180	175	180	190

We will take gale representative as so to sales territory 19.



W	M	0	1	1	141
220		100	200	A	
140	D	120	160	B	
5v	190	195	190	C	
190	160	1.75	100	D	

Row-Reduction

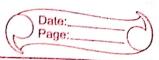
;				
•	Ţ	Û	<u>(1)</u>	D.
A	50	0	20	70
B	40	0	Ø	20
	O	5	0	10
0	20	15	0	30

column Reduction

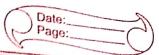
	- June	MOV (The same of	
l'a sal	100	1 D 02		W
	A	50	0 20	60
	B	40	O OP	10
	C	0-	-8-0-	0
V.f.	D	20	15 0	20
		1		19

		4
($A \rightarrow \emptyset$
	20 0 20 50	$B \rightarrow \Omega$
13	30 0 00	
C	0 25 20 0	C -> 2
N	10	$D \rightarrow \Omega$
<u>U</u>	10 15 0 10	
		(v)

10 total sales = 180 + 190 + 160 2 690



1	Page:
	Big-M Method
(D. 2)	Man 7 = 4x, +2x2
	subject to 3xy+x, 7,27
	24+24 7,21
	24, x2 >0
17	Man Z = 4x + 2x2 + 0s1 + 0s, -mA1 - mA2
	Subject to 3x +1x2 -15, +05 +1A1+042=27
	$121+12+0s_1-1s_2+0A_1+1A_2=21$
	£- } ,
	Mable-1 Cj 4 2 0 0 -m -m
1 4 16	CB 2B 24 72 S1 S2 A1 A2 Rotis
1 1	-m 1 3 1 -1 0 L 0 27
	-m A2 1 1 0 -1 0 1 21
	Z'-c' -4m-4 -2m-2 m m 0 0 - 40m
	priot element is 3 and 34 variable
	enters and 4 leaves
	where the same with the same of the same o
	Table - 2 Cj 4 2 0 0 - m - m
	Ce 2B 24 22 · Si Sa Ag Az Ratio
	· 24 1 1/3 -1/3 0 1/3 0 9
	A2 0 (2/2) 1/3 -1 -1/3 1 12
	$\frac{2j-cj}{0}$ $\frac{2j-cj}{0}$ $\frac{-2j^{m}-2j}{0}$ $\frac{-2j^{m}-2j}{0}$ $\frac{-1}{2}$
	2 → enter pirot element 2/3
	Az -1 leaves



	Jable-3 G 4 2 0 0 - m
	CB 76 21 7 0
	4 24 D -1.
	2 1 0 1 3 -3 -1/2 3/2 10
	Zj-cj: 0 0 -1 -1 m
	9-5, 0 0 -1 -1 m+1 m+1 48
	Sy - enter
4	22 - Leaves
	pirot -> 1/2
	interest to the second of the
	Mable-4 G 4 2 0 0 -m -m
	CB 2B 24 22 S S A A2 Retio
	4 29 1 1 0 -1 0 1 21
	0 9 1 -3 -1 3 36
	Zj-g 0 2 0 -4 m m+4 84
	The problem has infinite solution
	The problem has infinite solution variable of must enter but no variable. can leave.
	con leave.
	a for a special state of the