2006077
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Assignment - 01

Ans 1)

x : the no. of tons of grade x paper produced in a week.

y : the no. of tons of grade y paper produced in a week.

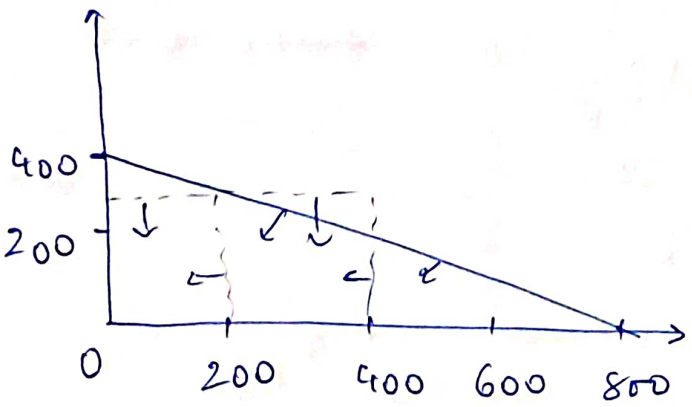
Maximise $Z = 200x + 500y$

subject to :-

$$x \leq 400$$
$$y \leq 300$$
$$0.2x + 0.4y \leq 160$$
$$x, y \geq 0$$

Ans 2) Solve the LPP using graphical method :-

$$0.2x + 0.4y \leq 160$$
$$y \leq -0.5x + 400$$
$$x = 400$$
$$y = 300$$



A (0, 300)

B (200, 300)

C (400, 200)

D (400, 0)

E (0, 0)

$Z = 200x + 500y$

for B, $Z_{max} = 140,000$

Ans 3) Maximize $Z = 2x_1 + 3x_2$

subject to constraints :-

$$x_1 + x_2 \leq 1$$
$$3x_1 + x_2 \leq 4$$
$$x_1, x_2 \geq 0$$

from constraint ① :-

$$x_1 + x_2 \leq 1$$

Put $x_1 = 0$; $x_2 = 1$

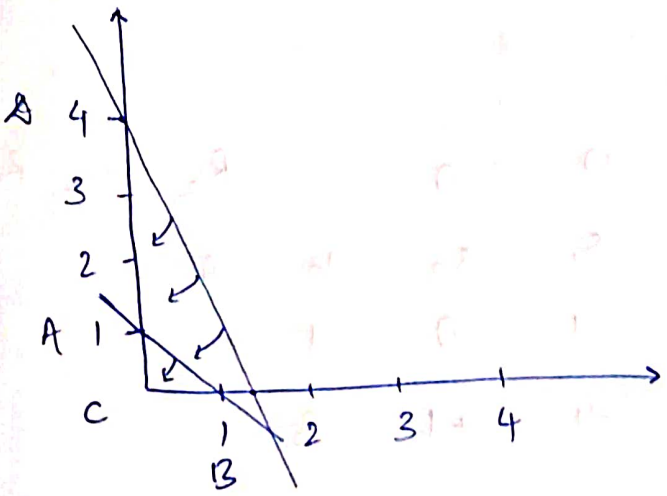
$x_2 = 0$; $x_1 = 1$

from constraint ② :-

$$3x_1 + x_2 = 4$$

Put $x_1 = 0$; $x_2 = 4$

$x_2 = 0$; $x_1 = 4/3 = 1.33$



✓ A (0, 1)

✓ B (1, 0)

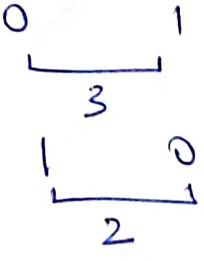
× D (0, 4)

✓ C (0, 0)

optimal max $Z = 2x_1 + 3x_2$

$\therefore$ max $Z = 3$

at $x_1 = 1, x_2 = 0$



Ans 4) $Z = 2x_1 + 3x_2$

subject to :-

$$x_1 + x_2 \leq 1$$
$$3x_1 + x_2 \leq 4$$
$$x_1, x_2 \leq 0$$

changing constraints :-

$$x_1 + x_2 + s_1 = 1$$
$$3x_1 + x_2 + s_2 = 4$$
$$Z = 2x_1 + 3x_2 + 0 \cdot s_1 + 0 \cdot s_2$$

	c_j	2	3	0	0		
C_B	Basis	x_1	x_2	s_1	s_2	b	θ
0	s_1	1	(1)	1	0	1	1 ←
0	s_2	3	1	0	1	4	4
	Z_j	0	0	0	0		
	$c_j - z_j$	2	3 ↑	0	0		

$R_2 = R_2 - R_1$

	c_j	2	3	0	0	
C_B	Basis	x_1	x_2	s_1	s_2	b
3	x_2	1	1	1	0	1
0	s_2	2	0	-1	+1	3
	Z_j	3	3	3	0	
	$c_j - z_j$	-1	0	-3	0	