Ans 2 Maximize $Z = 100x_1 + 40x_2$

Subjected to

$5x_1 + 2x_2 \le 1000$

$3x_1 + 2x_2 \le 900$

$x_1 + 2x_2 \le 500$

and $x_1 + x \ge 0$

Solution

(i) $5x_1 + 2x_2 \le 1000$

Put $x_1 = 0$ | Put $x_2 = 0$

$0 + 2x_2 \le 1000$ | $5x_1 + 0 = \le 1000$

$x_2 \le 500$ | $x_1 \le 200$

(ii) $3x_1 + 2x_2 \le 900$

Put $x_2 = 0$ | Put $x_1 = 0$

$3x_1 + 0 \le 900$ | $0 + 2x_2 \le 900$

$x_1 \le 300$ | $x_2 \le 450$

(iii) $x_1 + 2x_2 \le 500$

Put $x_2 = 0$ | Put $x_1 = 0$

$0 + x_1 \le 500$ | $0 + 2x_2 \le 500$

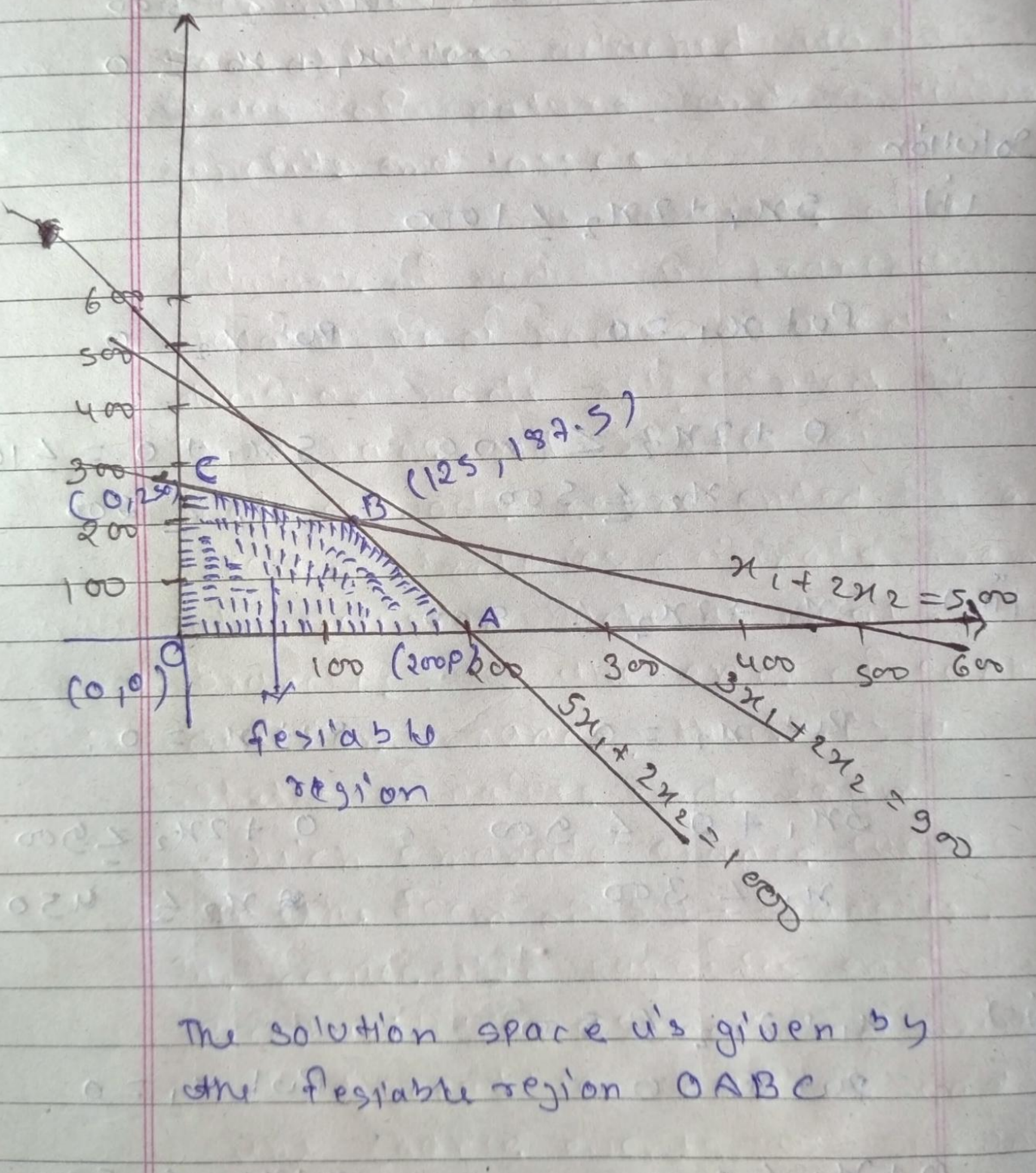
$x_1 \le 500$ | $x_2 \le 250$

(iv) $x_1 + x_2 \geq 0$

Put $x_1 = 0$ Put $x_2 = 0$

$0 + x_2 \geq 0$ $x_1 + 0 \geq 0$

$x_2 \geq 0$ $x_1 \geq 0$



The solution space is given by the fesiable rejion OABC

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centre point	value $z = 100x_1 + 40x_2$
O (0, 0)	0
A (200, 0)	20,000
B (125, 187.5)	201000 (Max value of z)
C (0, 250)	10,000

The maximum value of z occurs at two vertices A and B

since there are infinite no. of points on the line joining A and B gives the same maximum value of z. Thus, there are infinite no. of optimal solutions for the LPP.