"I am aware that any forms of cheating in this exam will result in a zero grade and a disciplinary investigation. I accept all rules and regulations regarding online exams. I give permission for the processing of my personal data as stated in the Clarification Text provided on the Faculty of Engineering website."

Question

Wild west produces two types of cowboy hats. A type 1 hat requires three times as much labor time as a type 2. If the all available labor time is dedicated, to Type 2 alone, the company can produce a total of 450 Type 2 hats a day. The market limits for the two types are 100 and 300 hats per day for Type 1 and Type 2, respectively. The profit is $8 per type 1 and $5 per Type 2 hat. Determine the number of hats of each type that would max. profit.

i) Build the mathematical model of problem.
ii) Solve the problem graphically.

i)

$X_1 \rightarrow$ Type 1

$X_2 \rightarrow$ Type 2

$X_1 \geq 0 \quad X_2 \geq 0$

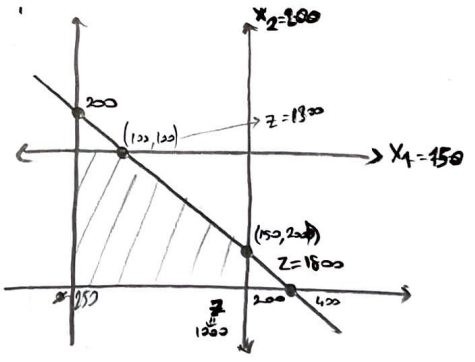
$\Rightarrow \quad 8X_1 + 5X_2 = Z$ (100, 200)

$2X_1 + X_2 \leq 400$ ✓ ✓

$X_1 \leq 150$ ✓ ✓

$X_2 \leq 200$ ✓ ✗

ii)



Opt. Point of → $X_1 = 100$

$X_2 = 200$

opt. value is = 1800

$8 \cdot 100 + 5 \cdot 200$

Cebrail AKPIT
150119987