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CLASS :- BS (SE) - 4

SUBJECT :- OPERATION
RESEARCH

SECTION :- A

(2)

QUESTION No 2

A manufacturer produce two types of products A and B

ANSWER:-

Sol:-

Types of Product

Type of product	number sold in month	Net Profit
A	150	
B	200	

The MD of the Company has set the following goal which are arrange in order of priority
P₁ No under utilization of plant production capacity.

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P_2 Sell maximum possible number of product A and B. The MD has twice as much desire to sell product A as for product B, because the net profit from the sale of product A is a twice the amount from that of product B.

P_3 Minimise overtime operation of the plant. Formulate the above as a goal programming problem and solve it.

So let x_1 and x_2 be the number of product A and B. Since overtime operation are not allowed

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$$X_1 + X_2 + d_1^- - d_1^+ = 500 \text{ (Plant capacity)}$$

where d_1^- = under utilisation of
duction capacity variable.
 d_1^+ = overtime production operation
capacity variable.

Since goal is the maximum
of sales, hence positive deviation will
not appear in constraints
related with sales

$$\text{Then } X_1 + d_2^- = 150$$

$$\text{and } X_2 + d_3^- = 200$$

d_2^- = under achievement of sale goal for (A)

d_3^- = under achievement of sale goal for (B)

Now the goal programming mathematically
model can be written as minimize

$$Z = p_1 d_1^- + 2p_2 d_2^- + p_2 d_3^- + p_3 d_1^+$$

Subject to the constraints.

$$X_1 + X_2 + d_1^- + d_1^+ = 500$$

$$X_1 + d_2^- = 150$$

$$X_2 + d_3^- = 200$$

$$\text{and } X_1, X_2, d_2^-, d_3^-, d_1^+ \geq 0$$

All the goal constraints can
be plotted on the graph.

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