

ID

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Name

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Subject

Operation Research

Semester

4<sup>th</sup> BS (SE)

Section

'A'

Teacher

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Major Assignment.

## Question no 2

A and B two product  
are produce by manufacturer.

Ans:

Product types

Type of product

Types of Product	Number sold in month	Net Profit
A	150	
B	200	

MD of the company has set  
the goal which are arranged  
in order of priority P<sub>1</sub>  
order utilization of plant production  
capacity.

P<sub>2</sub> Sell maximum numbers  
which are possible for it  
of product A and B. MD  
has desired to sell product  
as much twice. A is for  
product B. Because the net  
profit from the sale of product  
A is a twice the  
amount from that of product  
B.



And then  $P_3$  minimize  
overtime operation of the plant.  
formulate the above as  
a goal programming issue  
& and solve it.

So let  $X_1$  and  $X_2$  be  
the product number a and b.  
Since overtime are not allowed.

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

$d_1^-$  = under utilization of  $d_1^-$ .  
Overtime production capacity variable.  
 $d_1^+$  overtime production operation  
capacity variable.

Since goal is the maximum  
of sales. Positive deviation will  
not appear in constraint,  
related with sales.

$$X_1 + d_2^- = 150$$

$$X_1 + d_2^+ = 200$$

$d_2^- = 150$  under the achievement  
of sale for 'A'

$d_2^+ = 200$  under the achievement  
of sale goal for 'B'

Now the goal programming model can be written as minimize.

$$Z = P_1 d_1 + 2P_2 d_2 + P_3 d_3 + P_4 d_4 +$$

Subject to constrain

$$x_1 + x_2 + d_1^- + d_1^+ = 500$$

$$x_1 + d_2^- = 150$$

$$x_1 + d_3^- = 200$$

$$\text{and } x_1, x_2, d_1, d_2^-, d_3^-, d_4^+ \geq 0$$

All constraints goals can be plotted on the graph.

Graph:

