Questions on Solver LLP

Framing LLP problem

Q. Formulate the LPP in excel by declaring input variables, objective function and the left and right hand sides of all the constraints.

Maximize

Z = 10x+6y

Subject to the constraints

3x + y <=12

2x + 5y <=34

x, y >=0

Q: A firm buys casing of P and Q type of parts and sells them as finished products after machining, boring and polishing. The purchasing costs for casting are Rs 3 and Rs 4 for parts P and Q respectively and selling costs are Rs 8 and Rs 10 respectively. The per hour capacity of machines used for machining, boring and polishing for the two products is given below:

	Capacity per hour		
	P	Or	Q
Machine	30	Or	50
Boring	30	Or	45
Polishing	45	Or	30

The running costs for machining, boring and polishing are Rs 30, Rs 22.5 and Rs 22.5 per hour respectively. Fortunately the computerized linear programming problem to find out the product mix to maximize the profit by preparing the input variables, objective functions and the left and right hand sides of all constraints.

Q. A media specialist plans to allocate advertising expenditure in three media where unit costs of a message are Rs 1500, Rs 1250 and Rs 1000 respectively. The total advertising budget available for the year is Rs 50000. The first medium is a monthly magazine and it is desired to advertise not more than once in one issue. At least five advertisements should appear in the second medium and the number of advertisements in the third medium should strictly lie between 6 and 10. The effective audience for unit advertisement in the three media is given below:

Medium	1	2	3
Expected Effective Audience	50000	40000	25000

Formulate a linear programming problem to find the optimum allocation of advertising in three media that would maximize the total effective audience. Formulate the LPP in excel by declaring input variables, objective function and the left and right hand sides of all the constraints.

Q. Shyam, an agriculturist, has a farm with 125 acres. He produces radish, peas and potato. Whatever he raises is fully sold in the market. He gets Rs 5 for radish per kg, Rs 4 for peas per kg and Rs 5 for potato per kg. The average yield is 1500 kg of radish per acre, 1800 kg of peas per acre and 1200 kg of potato per acre. To produce each 100 kg of radish and peas and to produce each 80 kg of potato a sum of Rs 12.50 has to be used for manure. Labour required for each acre to raise the crop is 6 man days for radish and potato and each 5 days for peas. A total of 500 man days of labour at a rate of Rs 40 per man day are available. Formulate this as a linear model to maximize the Agriculturist's total profit by identifying the areas allocated to each kind of crop.

Formulate the LPP in excel by declaring input variables, objective function and the left and right hand sides of all the constraints.

Feasible Solutions

Q. Plot the feasible region of the following LPP and plot the feasible region graphically.

Maximize

Z = 10x+6y

Subject to the constraints

3x + y <=12

2x + 5y <=34

x, y >=0

Q. Solve the following LPP and plot the feasible region graphically.

Maximize

Z = 50x + 30y

Subject to the constraints

2x + y >= 18

x + y >= 12

3x + y <= 34

x, y >=0

Infeasible Solutions

Q. Solve the following LPP and plot the feasible region graphically.

Maximize

x

Subject to the constraints

x >= 5

x <= 2

Unbounded Solutions

Q. Solve the following LPP and plot the feasible region graphically.

Maximize

Z = 16x + 25y

Subject to the constraints

2x + y >= 7

x + y >= 5

2x + 5y >= 16

x, y >=0

Q. Solve the following LPP and plot the feasible region graphically.

Maximize

x

subject to

x >= 5

Multiple Optimum Solutions

Q. Solve the following LPP and plot the feasible region graphically.

Maximize

$Z = 4x + 3y$

Subject to the constraints

$3x + 4y \leq 24$

$8x + 6y \leq 48$

$x \leq 5$

$y \leq 6$

$x, y \geq 0$