**Linear Programming Problem**

**(Solving)**

1. Mohan-Meakins Breweries Ltd. Has bottling plants, one located at Solan and the other located at Mohan-Nagar. Each plant produces three drinks namely, Whisky A, Beer B and Fruit Juice C. The number of bottles produced per day are as follows:

|  |  |  |
| --- | --- | --- |
|  | **Plant At** | |
| **Drinks** | **Solan** | **Mohan-Nagar** |
| Whisky A | 1500 | 1500 |
| Beer B | 3000 | 1000 |
| Fruit Juice C | 2000 | 5000 |

A market survey indicates that during the month of April, there will be a demand of 20,000 bottles of Whisky A, 40,000 bottles of Beer B and 44,000 bottles of Fruit Juice C. The operating costs per day for the plants at Solan and Mohan-Nagar are 600 and 400 rupees per day. For how many days each plant be run in April so as to minimise the production cost, while still meeting the market demand? Formulate the model and provide solution.

1. The following is the information of two parts A and B manufactured by a certain company per week.

|  |  |  |  |
| --- | --- | --- | --- |
| Type of Machine | Time Required per unit | | Maximum Time Available |
| A | B |  |
| Lathes | 12 | 6 | 3000 |
| Milling | 4 | 10 | 2000 |
| Grinding | 2 | 3 | 900 |
| Profit per unit(in Rs.) | 40 | 100 |  |

Formulate the model and provide solution for maximising the profit.

1. A Company producing three brands of Shampoos has two plants located at two places. Each plant has following production capacities per day:

|  |  |  |  |
| --- | --- | --- | --- |
| Plants | Brands (Bottles per day) | | |
|  | Fresh | Blossom | Moon |
| I | 3000 | 1000 | 2000 |
| II | 1000 | 1000 | 6000 |

A market survey indicates that during any particular month there will be minimum demand of 24,000 bottles of Fresh, 16,000 bottles of Blossom and 48,000 bottles of Moon. The operative costs per day of running the plants I and II are 600 monetary units and 400 monetary units respectively. The other fixed overhead costs for plants I and II are Rs.100 and Rs.150 per day respectively. How many days should the company run each plant during the month so that the production cost is minimised while meeting the market demand?

1. Nirmitee farms uses at least 800 lb of special feed daily. The special feed is a mixture of corn and soyabean meal with the following compositions:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Lb per lb of feedstuff** | |  |
| **Feedstuff** | **Protein** | **Fiber** | **Cost (Rs./lb)** |
| Corn | 0.09 | 0.02 | 0.30 |
| Soyabean | 0.60 | 0.06 | 0.90 |

The dietary requirements of the special feed are at least 30% protein and at most 5% fiber. Nirmitee farms wishes to determine the daily minimum cost feed mix.