FORMULATION OF LPP

1. An individual wishes to invest 5,00,000 over the next year in two types of investment: Investment *A* yields 5%, and investment *B* yields 8%. Market research recommends an allocation of at least 25% in *A* and at most 50% in *B*. Moreover, investment in *A* should be at least half the investment in *B*. How should the fund be allocated to the two investments? Build a LP model for the problem.

2. Progress City is studying the feasibility of introducing a mass-transit bus system to reduce in-city driving. The study seeks the minimum number of buses that can handle the transportation needs. After gathering necessary information, the city engineer noticed that the minimum number of buses needed fluctuated with time of the day, and that the required number of buses could be approximated by constant values over successive 4-hr intervals. Following table summarizes the engineer's findings. To carry out the required daily maintenance, each bus can operate only 8 successive hours a day.

Period	Time slot	Minimum bus required
1	12:00AM-04:00AM	4
2	04:00AM-08:00AM	8
3	08:00AM-12:00PM	10
4	12:00PM-04:00PM	7
5	04:00PM-08:00PM	12
6	08:00PM-12:00PM	4

Construct a LP model for the problem.

3. The Burroughs Garment Company manufactures men's garment and women's garment for Walmark Discount Stores. Walmark will accept all the production supplied by Burroughs. The production process includes cutting, sewing, and packaging. Burroughs employs 25 workers in the cutting department, 35 in the sewing department, and 5 in the packaging department. The factory works one 8-hr shift, 5 days a week. The following table gives the time requirements and profits per unit for the two garments.

Garment	Minutes per unit			Unit profit ($)
	Cutting	*Sewing*	*Packaging*	
Men's	20	70	12	8
Women's	60	60	4	12

Build a LP model for the problem.

GRAPHICAL METHOD FOR SOLVING LPP

1. A soft drink manufacturing company has 300 ml and 150 ml canned cola as its products with profit margin of Rs. 4 and Rs. 2 per unit respectively. Both the products have to undergo process in three types of machine. The following Table, indicates the time required on each machine and the available machine-hours per week.

Requirement	Cola 300 ml	Cola 150 ml	Available machine hours per week
Machine 1	3	2	300
Machine 2	2	4	480
Machine 3	5	7	560

Formulate the linear programming problem specifying the product mix which will maximize the profits within the limited resources. Also solve the problem using graphical method.

2. Solve the following LPP using graphical method:

Find x_1 and x_2 so as to

$$Minimize\ z = 2x_1 + 8x_2$$
$$subject\ to, x_1 + x_2 \geq 9$$
$$3x_1 + x_2 \geq 12$$
$$x_1, x_2 \geq 0$$

3. Solve the following LPP using graphical method:

Find x_1 and x_2 so as to

$$Maximize\ z = 5x_1 + 4x_2$$
$$subject\ to, 6x_1 + 4x_2 \leq 24$$
$$x_1 + 2x_2 \leq 6$$
$$-x_1 + x_2 \leq 1$$
$$x_2 \leq 2$$
$$x_1, x_2 \geq 0$$