1. Iron ore is to be transported from three mines to four steel mills situated in different cities. Find the minimum cost transportation schedule given the following cost matrix:

		Steel Mills				
		A	B	C	D	Ore Available
	1	14	56	48	27	13
Mines	II	82	35	21	81	19
	JH	99	31	71	63	16
Ore required		7	14	21	6	

2. In a flood relief operation, there are four bases of operations B_i, $(i=1,2,3,4)$ from where air crafts can take relief materials to three targets T_j ($j = 1, 2, 3$). Because of the difference in air crafts range to target and flying altitudes, the relief material (in tons) per aircraft from any base that can be delivered to any target differs according to following table:

	T_1	T_2	T_3
B_1	8	6	5
B_2	6	6	6
B_3	10	8	4
B_4	8	6	4

The daily sortie capacity of each of the four bases is 150 sorties per day and the daily requirement of sorties on each target is 200. Find the allocation of sorties that maximizes the total tonnage over all the targets. If the problem has alternative solutions, find' one.

''   3 In the following transportation problem, the penalty costs per unit of unsatisfied demand are 5, 3, 2 for destinations 1, 2, and 3 respectively. Determine the optimal solution and write the LPP for the given problem,

	DI	D2	D3	Availability
S1	5	1	7	10
S2	6	4	6	80
52	3	2	5	15
	75	20	50	

4. Consider the following transportation problem with minimum cost.

	D_1	D_2	D_3	. D_4	D_5	Availability
O_1	20	19	14	21	16	40
O_2	15	20	13	19	16	60
O_3	18	15	18	20	10	70
Requirement	30	40	50	40	60	

Find an optimal solution of this transportation problem under the following conditions:

(i)   There is no transportation from origin O_3 to destination D_5
(ii)   The Origin O_1, supplies exactly 20 units to Destination D_4.
(iii) The Destination D_2 receives atleast 10 units from Origin O_2.

5. Solve the following transportation problem for minimum cost starting with the degenerate basis $x_{12}=30$, $x_{21}=40$, $x_{32}=20$, $x_{43}=60$.

	D_1	D_2	D_3	Availability
O_1	4	5	2	30
O_2	4	1	3	40
O_3	3	6	2	20
O_4	2	3	7	60
Requirement	40	50	60	

6. A company has four plants producing the same product. The production cost differs from one plant to another as do the cost of raw materials. There are five regional warehouses. Sales price at each is different. The maximum sales, capacity, unit transportation costs etc. are given in the following table. Determine the transportation schedule which maximizes the overall profit.

		Plants				
Warehouse	1	2	3	4	Sales (Price)	
Production cost	15	18	14	13		
Raw material cost	10	9	12	8		
						Availability
1	3	9	5	4	34	80
2	1	7	4	5	32	110
3	5	8	3	6	31	150
4	7	3	8	2	31	100
5	4	5	6	7	31	150
Demand	150	200	175	100		