**ASSIGNMENT NO.- 8[Ch-12(Linear Programming)]**

**Class -XII**

1. Solve the following linear programming problem by graphical method:

 Maximise $Z=5x+3y$ subject to $3x+5y\leq 15 ;5x+2y\leq 10$ and $x,y\geq 0.$

2. Solve the following L.L.P. graphically:

 Maximise $Z=4x+y$ subject to constraints $x+y\leq 50 ;3x+y\leq 90 ; x\geq 10 ;x,y\geq 0.$

3. Solve the following L.L.P. graphically:

 Minimise : $Z=5x+7y$ subject to constraints

 $x+y\leq 4 ;3x+8y\leq 24 ;10x+7y\leq 35 ;x,y\geq 0$

4. Kellogg is a new cereal formed of a mixture of bran and rice that contains at least 88 gms of

 protein and at least 36 milligrams of iron.Knowing that bran contains 80 gms of protein and 40

 milligrams of iron per kilogram,and that rice contains 100 gms of protein and 30 milligrams of iron

 per kilogram,find the minimum cost of producing this new cereal,if bran costs Rs 5 per kg and rice

 costs Rs 4 per kg.

5. A merchant plans to sell two types of personal computers ,a desktop model and a portable model

 that will cost Rs 25000 and Rs 40000 respectively.He estimates that the total monthly demand of

 computer will not exceed 250 units.Determine the number of units of each type of computer

 which the merchant should stock to get maximum profit,if he does not want to invest more than

 Rs 70 Lakh and his profit on the desktop model is Rs 4500 and on the portable model is Rs

 5000.Make a LPP and solve it graphically.

6. A house-wife wishes to mix together two kinds of foods X and Y,in such a way that the mixture

 contains at least 10 units of vitamin A, at least 12 units of vitamin B and at least 8 units of vitamin

 C.The vitamin contents of one kg of each food is given below:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Vitamin A | Vitamin B | Vitamin C |
| Food X | 1 | 2 | 3 |
| Food Y | 2 | 2 | 1 |

 One kg of food X costs Rs 60 and one kg of food Y costs Rs 100.Find the least cost of the mixture

 which will produce the diet.

7. If a man rides his motorcycle at 30 km/hr ,he has to spend Rs 2/km on fuel.If he rides it at 40

 km/hr ,the fuel cost increases to Rs 4/km.He has Rs 120 to spend on fuel and wishes to travel the

 maximum distance within 1 hour.Express this as a LPP and solve it.

8. A retired person wants to invest an amount of Rs 50000.His broker recommends investing in two

 types of bonds ‘A’ and ‘B’ yielding 10% and 9% return respectively on the invested amounts.He

 decides to invest at least Rs 20000 in bond ‘A’ and at least Rs 10000 in bond ‘B’.He also wants to

 invest at least as much in bond ‘A’ as in bond ‘B’.Solve this LPP graphically to maximise his returns.

9. A dealer wishes to purchase a number of fans and sewing machines.He has only Rs 5760 to invest

 and has a space for at most 20 items.A fan costs him Rs 360 and a sewing machine Rs 240.His

 expectation is that he can sell a fan at profit of Rs 22 and a sewing machine at a profit of Rs

 18.Assuming that he can sell all items that he can buy,how should he invest his money in order to

 maximise the profit? Formulate this as a LPP and solve it graphically.

10. Two tailors ‘A’ and ‘B’ earn Rs 150 and Rs 200 per day respectively.’A’ can stitch 6 shirts and 4

 pants per day,while ‘B’ can stitch 10 shirts and 4 pants per day.Form a LPP to minimise the

 labour cost to produce at least 60 shirts and 32 pants.