MATHS

BOOKS - JMD MATHS (PUNJABI ENGLISH)

Liner Programming

Example

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1. Fill in the blanks :

(iii) The region represented by $x \geq 0, y \geq 0$

is ..

2. Fill in the blanks :

(ii) The region represented by $x \leq 0, y \geq 0$

is ..

3. Fill in the blanks :

(iii) The region represented by $x \geq 0, y \geq 0$

is ..

4. The point which does not lie in half plane 2x

$- 3y - 6 \leq 0$ is

A. (2,0)

B. (0,3)

C. (4,0)

D. (2,2)

Answer:

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5. The point which lies in half plane 3x - y $\geq$ 3 is :

    A. (0, 0)

    B. (2,0)

    C. (1,2)

    D. (0,1)

Answer:

6. The quadrant represents x $\geq$ 0, y $\leq$ 0 is :

A. $1^s t$

B. $2^n d$

C. $3^r d$

D. $4^t h$

Answer:

7. The point which does not lie in half plane of

$x \geq 2y$ is :

    A. (2,0)

    B. (5,1)

    C. (6,2)

    D. (1,2)

Answer:

▶

8. The point which lies in half plane of $x - 3y \leq 3$ is :

A. (1,0)

B. (4,0)

C. (8,1)

D. (9,2)

Answer:

9. State True/False:

The region represent by x $\leq$ 0, y $\leq$ 0 is thye

third quadrant.

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10. State True/False:

The point (1,2) satisfies 2x + y $\geq$ 5

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11. State True/False:

The origin satisfies $3x - y \geq 1$.

12. Solve the following LLp graphically :

Maximise $Z = 4x + y$

subject to constraints : $x + y \leq 50$, $3x + y \leq 90$, $x \geq 10$, $y \geq 0$.

13. Maximize Z = -x + 2y, subject to the constraints : x $\geq$ 3, x + y $\geq$ 5, x + 2y $\geq$ 6, y $\geq$ 0.

14. A farmer has a supply of chemical fertilizer of type A which contains 10 % nitrogen and 6% phosphoric acis and type B fertilizer which contains 5% nitrogen and 10% phosphoric acid. After testing the soil condition of a field,

it is found that at least 14 kg of nitrogen and 14 kg of phosphoric acid are required for a good crop. The fertilizer type A costs Rs 5 per kg and type B Rs 3 per kg. How many kilograms of each fertilizer should be used to meet the requirements and the cost be minimum? Using LPP, solve the above problem graphically.

15. A factory owner purchases two types of machines, A and B fo his factory. The

requirements and the limitation for the machines are as followes :

Machine	Area occupied	Labour force	Daily output (in units)
A	1000 m²	12 men	60
B	1200 m²	8 men	40

He has maximum area of $9000m^2$ available, and 72 skilled labourers who can operate both the machines. How many machines of each type should be buy to maximise the daily output ?

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16. An aeroplane can carry maximum of 200 passengers, A profit of ₹ 400 is made on each first class ticket and a profit of ₹ 300 is made in each second class ticket. The airline reserves at least 20 seates for first class. However, at least four times as many passengers prefer to travel by second class than first class. Determine how many tickets of each type must be sold to maximise profit for the airline. Form an L.P.P. and solve it graphically.

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17. Every gram of wheat provides 0.1 g of protien and 0.25 g of carbohydrates. The corresponding values for rice are 0.05 g and 0.5 g respectively. Wheat costs Rs 4 per kg and rice Rs 6 per kg. The minimum daily requirements of protien and carbohydrates for an average child are 50 g and 200 g respectively. In what quantities should wheat and rice be mixed in the daily diet so as to provide the maximum daily requirements of protien and carbohydrates at minimum cost? Frame a LPP and solve it graphically.

18. A furniture firm manufactures chairs and tables, each requiring the use of three machines A, B and C. Production of one chair requires 2 hours on machine A, 1 hour on machine B and 1 hour on machine C. Each table requires 1 hour each on machine A and B and 3 hours on machine C. The profit obtained by selling on chair is ₹ 30 while by selling one table the profit is ₹ 60. The total time available per week on machine A is 70 hours, on

machine B is 40 hours and on machine C is 90 hours. How many chairs and tables should be made per week so as to maximize profit ? Formulate the problem as L.P.P. and sovle it graphically.

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19. A small firm manufactures gold rings and chains. The total number of rings and chains manufactured per day is almost 24. it takes 1 hour to make a ring and 30 minutes to make a

chain. The maximum number of hours available per day is 16. If the profit on a ring is ₹ 300 and that on a chain is ₹ 190, find the number of rings and chains that should be manufactured per day, so as to earn the maximum profit. Makes it is an L.P.P and solve it graphically.

20. A diet is to contain at least 80 units of vitamin A and 100 units of minerals. Two food

F1 and F2 are available. Food F1 costs Rs. 4 per unit food and F2 costs Rs. 6 per unit. One unit of food F1 contains 3 units of vitamin A and 4 units of minerals. One unit of food F2 contains 6 units of vitamin A and 3 units of minerals. Formulate this-as linear programming problem. Find the minimum cost for diet that consists of mixture of these two foods and also meets the minimal nutritional requirements.

21. A manufacturer produces two products A and B. Both the products are processed on two different machines. The available capacity of first machine is 12 hours and that of second machine is 9 hours per day. Each unit of product A requires 3 hours on both machines and each unit of product B requires 2 hours on first machine and 1 hour on second machine. Each unit of product A is sold at ₹ 7 profit and that of B at a profit oft ₹ 4. Find the production level per day for maximum profit graphically.

22. A manufacturing company makes two types of teaching aids A and B of Mathematics for class XII. Each type of A requires 9 labour hours of fabricating and 1 labour hour for finishing. Each type of B requires 12 labour hours for fabricating and 3 labour hours for finishing. For fabricating and finishing, the maximum labour hours available per week are 180 and 30 respectively. The company makes a profit of ₹ 80 on each piece of type A and ₹ 120

on each piece of type B. How many pieces of type A and type B should be manufactured per week to get a maximum profit ? Make it as LPP and solve graphically. What is the maximum profit per week ?

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