doubtnut
India's Number 1 Education App

MATHS

BOOKS - NIKITA MATHS (HINGLISH)

LINEAR PROGRAMMING

Mcqs

1. L.P.P. is a process of finding

A. maximum value of objective function

B. minimum value of objective function

C. optimal value of objective function

D. only maximum value of objective function

Answer: C

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2. Optimization of the objective function is a process of

A. maximizing the objective function

B. maximizing or minimizing the objective function

C. minimizing the objective function

D. only minimizing the objective function

Answer: B

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3. Objective function of an LPP is

A. a constraint

B. a function to be optimised

C. a relation between the variable

D. feasible region

Answer: B

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4. The function to be optimized is called

A. an objective function

B. the constraint

C. the non-negative constraint

D. an inequality

Answer: A

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5. Which of the following statement is correct ?

A. A L.P.P admits a unique solution

B. Every L.P.P. does not admits an optimal solution

C. If a L.P.P. admits two optimal solution, then it has infinite number of optimal solution

D. A L.P.P. admits two optimal solution.

Answer: C

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6. The optimal value of the objective function is attained at the points

A. given by intersection of inequations with axes only

B. given by by intersection of inequations with X-axis only

C. given by corner points of the feasible region

D. given by corner points

Answer: C

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7. The maximum or minimum of the objective funtion occurs only at the corner points of the feasible region. This theorem is known as fundamental theorem of

A. Algebra

B. Arithmetic

C. Calculus

D. Extreme point

Answer: D

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8. Corner points of fealible region of inequalities gives

A. an optiomal solution of L.P.P.

B. an objective function

C. the constraints.

D. the linear assumption.

Answer: A

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9. The feasible solution of a LPP belongs to

A. first and second

B. first and third

C. only second

D. only first

Answer: D

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10. L.P.P. has constraints of

A. one variables

B. two variables

C. one or two variables

D. two or more variables

Answer: D

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11. If the constraints in a linear programming problem are changed

A. the problem is to be re-evaluated

B. solution is not defined

C. the objective function has to be modify

D. the changes in constraints ignored

Answer: A

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12. Which of the following statement is incorrect

A. Maximize the objective function when more than one optimal solution is obtained

B. Maximize the objective function when the feasible region is unbounded

C. Maximize the objective function when the feasible region is bounded

D. If a L.P.P. admits two optimal solution, then it has infinite number of optimal solution

Answer: B

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13. Minimize $z = \sum_{j=1}^{n} \sum_{i=1}^{m} c_{ij} x_{ij}$, subject to

$\sum + (i = 1)^n x_{ij} = a_i, i = 1, 2, \ldots m$ and

$\sum_{i=1}^{m} x_{ij} = a_i, i = 1, 2, \ldots n$ js a L.P.P. with number of constraints

A. $m + n$

B. $m - n$

C. mn

D. $\frac{m}{n}$

Answer: A

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14. Region represented by the inequalities $x \geq 0, y \geq 0$ is

A. first quadrant

B. second quadrant

C. third quadrant

D. fourth quadrant

Answer: A

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15. Solution set of the inequality $x \geq 0$ is

A. half plane on the left of Y-axis

B. half plane on the right of Y-axis excluding Y-axis

C. half plane on the right of Y-axis including the points on Y-axis

D. half plane on the left of Y-axis including the points on Y-axis

Answer: C

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16. Solution set of the inequality $y \leq 0$ is

A. half plane below X-axis excluding the points on X-axis

B. half plane below X-axis including the points on X-axis

C. half plane above X-axis

D. half plane above X-axis including the points on X-axis

Answer: B

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17. Which of the term is not used in a linear programming problem ?

A. Slack variable

B. Objective funciton

C. Concave region

D. Feasible region

Answer: C

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18. A set is said to be convex if

A. all points except the end points of the segment inside the set lie inside the set

B. it is concave

C. all points on segment in the set lie inside the set

D. all points on segment in the set lie outside the set

Answer: C

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19. Which of the following set is convex?

A. $\{(x, y) : x^2 + y^2 \geq 1\}$

B. $\{(x, y) : y^2 \geq x\}$

C. $\{(x, y) : 3x^2 + 4y^2 \geq 5\}$

D. $\{(x, y) : y \geq 2, y \leq 4\}$

Answer: D

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20. Which of the following set is not a convex set?

A. $\{(x, y) : 1 \leq x^2 + y^2 \leq 3\}$

B. $\{(x, y) : x^2 + y^2 \leq 2\}$

C. $\{(x, y) : x + y \leq 1\}$

D. $\{(x, y) : 2x^2 + 3y^2 \leq 6\}$

Answer: A

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21. which of the following is not a convex set?

A. $\{(x, y): 2x + 2y \leq 7\}$

B. $\{(x, y): x^2 + y^2 \leq 4\}$

C. $\{x: |x| = 5\}$

D. $\{(x, y): 2x^2 + 3y^2 \leq 6\}$

Answer: C

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22. The maximum value of $z = 11x + 8y$ subject to $x \leq 4, x + y \leq 6, x \geq 0, y \geq 0$ is

A. 0

B. 48

C. 60

D. 44

Answer: C

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23. Maximize :

$z = 3x + 5y$

Subject to : $x + 4y \leq 24$

$3x + y \leq 21$

$x + y \leq 9$

$x \geq 0, y \geq 0$

A. 21

B. 37

C. 33

D. 30

Answer: B

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24. The maximum value of $z = 4x + 6y$ subject to $3x + 2y \leq 12, x + y \geq 4, x \geq 0, y \geq 0$ is

A. 36

B. 16

C. 24

D. 38

Answer: A

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25. The maximum value of $z = 7x + 11y$ subject to $3x + 5y \leq 26, 5x + 3y \leq 30, x \geq 0, y \geq 0,$ is

A. 42

B. 57.2

C. 61.6

D. 59

Answer: D

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26. The maximum value of $z = 6x + 4y$ subject to $x \leq 2, x + y \leq 3, \ - 2x + y \leq 1, x \geq 0, y \geq 0,$ is

A. 13

B. 16

C. 13.33

D. 16.33

Answer: B

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27. The minimum value of z = 10x + 25y subject to $0 \leq x \leq 3, 0 \leq y \leq 3, x + y \leq 5$ is ....

A. 75

B. 80

C. 95

D. 105

Answer: C

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28. The maximum value of $z = 75x + 50y$ subject to $8x + 5y \leq 60, 4x + 5y \leq 40, x \geq 0, y \geq 0$ is

A. 400

B. 562.5

C. 575.5

D. 575

Answer: D

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29. Maximise $Z = 5x + 3y$

Subject to $3x + 5y \leq 15, 5x + 2y \leq 10, x \geq 0, y \geq 0.$

A. 10

B. 0

C. 6

D. 12

Answer: A

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30. Maximise $Z = 5x + 3y$

Subject to $3x + 5y \leq 15, 5x + 2y \leq 10, x \geq 0, y \geq 0.$

A. at one point only

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

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31. The maximum value of $z = 15x + 30y$ subject to $3x + y \leq 12, x + 2y \leq 10, x \geq 0, y \geq 0$ is

A. 60

B. 150

C. 160

D. 100

Answer: B

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32. The objective function $z = 15x + 30y$ subject to $3x + y \leq 12, x + 2y \leq 10, x \geq 0, y \geq 0,$ can be maximized

A. at infinite number of points

B. at two points only

C. at one points only

D. at three points only

Answer: A

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33. The maximum value of $z = x + y$ subject to $x + y \leq 10, 3x - 2y \leq 15, x \leq 6, x \geq 0, y \geq 0$ is

A. 5

B. 7.5

C. 12

D. 10

Answer: D

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34. The objective function $z = x + y$ subject to $x + y \leq 10, 3x - 2y \leq 15, x \leq 6, x \geq 0, y \geq 0$ can be maximized

A. at one point only

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

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35. The objective function $z = x_1 + x_2$, subject to $x_1 + x_2 \leq 10, \ -2x_1 + 3x_2 \leq 15, x_1 \leq 6, x_1, x_2 \leq 0$ has maximum value of the feasible region.

A. 5

B. 7.5

C. 12

D. 10

Answer: D

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36. The objective function $z = x_1 + x_2$, subject to $x_1 + x_2 \leq 10, \ -2x_1 + 3x_2 \leq 15, x_1 \leq 6, x_1, x_2 \leq 0$ has maximum value of the feasible region.

A. at one point only

B. at two points only

C. at every point of the segment joining two points

D. at every point of the line joining two points

Answer: C

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37. The objective function $z = 4x + 3y$ subject to $3x + 4y \leq 24, 8x + 6y \leq 48, x \leq 5, y \leq 6, x \geq 0, y \geq 0$ can be maximized

A. at only one point

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

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38. The maximum value of Z is where, Z=4x+2 subject to constraints 4x+2y $\geq$ 46, x+3y ≤ 24 and $x, y \geq 0$, is

A. exactly one point

B. two point

C. three point

D. infinite number of points

Answer: D

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39. By graphical method, the solutions of linear programming problem maximise $Z = 3x_1 + 5x_2$ subject to constraints $3x_1 + 2x_2 \leq 18, x_1 \leq 4, x_2 \leq 6x_1 \geq 0, x_2 \geq 0$ are

A. $x_1 = 2, x_2 = 0, z = 6$

B. $x_1 = 2, x_2 = 6, z = 36$

C. $x_1 = 4, x_2 = 3, z = 27$

D. $x_1 = 4, x_2 = 6, z = 42$

Answer: B

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40. The point for which the maximum value of z=x+y subject to the constraints $2x + 5y \leq 100, \frac{x}{25} + \frac{y}{50} \leq 1, x \geq 0, y \geq 0$ is obtained at

A. (10,20)

B. (25,0)

C. (0,20)

D. $\left(\frac{75}{4}, \frac{25}{2}\right)$

Answer: D

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41. The minimum value of $z = 20x + 20y$ subject to $x + 2y \geq 8, 3x + 2y \geq 15, 5x + 2y \geq 20, x \geq 0, y \geq 0$ is

A. 115

B. 125

C. 105

D. 200

Answer: A

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42. The minimum value of $z = 6x + 21y$ subject to $x + 2y \geq 3, x + 4y \geq 4, 3x + y \geq 3, x \geq 0, y \geq 0$ is

A. 20.5

B. 28.8

C. 24

D. 22.5

Answer: D

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43. The minimum value of $z = 20x + 9y$ subject to $2x + y \geq 36, 6x + y \geq 60, x \geq 0, y \geq 0$ is

A. 330

B. 336

C. 360

D. 333

Answer: B

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44. The minimum value of $z = 7x + y$ subject to $5x + y \geq 5, x + y \geq 3, x \geq 0, y \geq 0$ is

A. 5

B. 2.5

C. 6

D. 3.5

Answer: A

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45. The minimum value of $z = 8x + 10y$ subject to $2x + y \geq 7, 2x + 3y \geq 15, y \geq 2, x \geq 0, y \geq 0$ is

A. 56

B. 52

C. 51

D. 48

Answer: B

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46. The minimum value of $z = 6x + 2y$ subject to $5x + 9y \leq 90, x + y \geq 4, y \leq 8, x \geq 0, y \geq 0$ is

A. 24

B. 6

C. 8

D. 16

Answer: C

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47. The objective function, $z = 4x_1 + 5x_2$, subject to $2x_1 + x_2 \geq 7, 2x_1 + 3x_2 \leq 15, x_2 \leq 3, x_1, x_2 \geq 0$ has minimum value at the point

A. on X-axis

B. on Y-axis

C. at the origin

D. on the line parallel to X-axis

Answer: A

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48. The minimum value of $z = 3x + 5y$ subject to $2x + 3y \geq 12, \ -x + y \leq 3, x \leq 4, y \geq 3$ is

A. 19.8

B. 19.5

C. 19.4

D. 19.6

Answer: A

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49. The minimum value of $z = 8x + 4y$ subject to $x + 2y \geq 2, 3x + y \geq 3, 4x + 3y \geq 6, x \geq 0, y \geq 0$ is

A. 9.8

B. 11.2

C. 9.6

D. 12

Answer: C

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50. The minimum value of $z = 2x + 4y$ subject to $x + 2y \geq 2, 3x + 2y \geq 6, x \geq 0, y \geq 0$ is

A. 4

B. 6

C. 3

D. 12

Answer: A

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51. The objective function $z = 2x + 4y$ subject to $2x + y \geq 3, x + 2y \geq 6, x \geq 0y \geq 0$ can be minimized

A. at infinite number of points

B. at two points only

C. at one points only

D. at three points only

Answer: A

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52. The minimum value of $z = x + 2y$ subject to $x + 2y \geq 50, 2x - y \leq 0, 2x + y \leq 100, x \geq 0, y \geq 0$ is

A. 10

B. 30

C. 40

D. 50

Answer: D

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53. The objective function $z = x + 2y$ subject to $x + 2y \geq 50, 2x - y \leq 0, 2x + y \leq 100, x, y \geq 0$ can be minimized

A. at infinite number of points

B. at two points only

C. at one points only

D. at three points only

Answer: A

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54. Minimize $z = 6x + 4y$, subject to

$3x + 2y \geq 12, x + y \geq 5, 0 \leq x \leq 4, 0 \leq y \leq 4.$

A. 22

B. 24

C. 40

D. 28

Answer: B

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55. The objective function $z = 6x + 4y$ subjective to $3x + 2y \geq 12, x + y \geq 5, 0 \leq x \leq 4, 0 \leq y \leq 4$ can be minimized

A. at one point only

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

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56. The co-ordinates of the point for minimum value z = 7x - 8y subject to the conditons $x+y-20\leq 0, y\geq 5, x\geq 0,$ is

A. (20,0)

B. (15,5)

C. (0,5)

D. (0,20)

Answer: D

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57. The constraints $x+y \geq 5, x+2y \geq 6, x \geq 3, y \geq 0$ and the objective function $z = -x+2y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

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58. The constraints $x-y \leq 1, x-y \geq 0, x \geq 0, y \geq 0,$ and the objective function $z = x+y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

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59. The constraints $3x + 2y \geq 9, x - y \leq 3, x \geq 0, y \geq 0$ and the objective function $z = 4x + 2y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

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60. The constraints $x - y \geq 0, \ -x + 3y \leq 3, x \geq 0, y \geq 0$ and the objective function $z = 6x + 8y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

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61. The constraints $-x + y \leq 1, \ -x + 3y \leq 9, x \geq 0, y \geq 0$ defines

A. bounded feasible region

B. unbounded feasible region

C. both bounded and unbounded region

D. unique solution

Answer: B

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62. The area of the feasible region for the following constraints $3y + x \geq 3, x \geq 0, y \geq 0$ will be

A. bounded

B. unbounded

C. convex

D. concave

Answer: B

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63. The constraints $x + y \geq 8, 3x + 5y \leq 15, x \geq 0, y \geq 0$ and the objective function $z = 1.5x + y$ has

A. concave solution

B. no unique solution

C. bounded solution

D. unique solution

Answer: B

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64. The constraints $x+y\leq 8, 2x+3y\leq 12, x\geq 0, y\geq 0$ and the objective function $z=4x+6y$ has

A. concave solution

B. no unique solution

C. bounded solution

D. unique solution

Answer: B

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65. The constraints $x+2y \le 2, 2x+4y \ge 8, x \ge 0, y \ge 0$ and the objective function $z=7x-3y$ has

A. concave solution

B. no unique solution

C. bounded solution

D. unique solution

Answer: B

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66. The constraints $x-y \ge 0, \ -2x+y \ge 2, x \ge 2, x \ge 0, y \ge 0$ and the objective function $z=4x+5y$ has

A. concave solution

B. no solution

C. bounded solution

D. unique solution

Answer: B

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67. Solution set of inequalities $x-2y \geq 0, \ -2x-y+2 \leq 0, x \geq 0, y \geq 0$

A. empty

B. closed half plane

C. infinite

D. first quadrant

Answer: C

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68. The region represented by the inequations $2x + 3y \leq 18, x + y \geq 10, x \geq 0, y \leq 0$ is

A. a polygon

B. unbounded

C. bonded

D. null region

Answer: B

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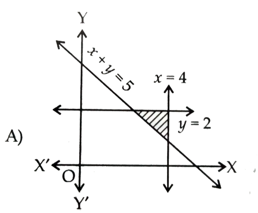
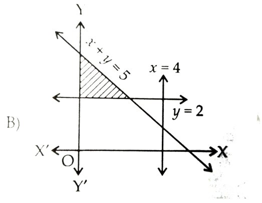
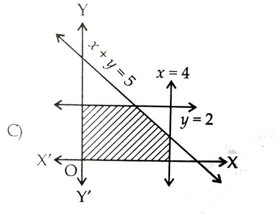
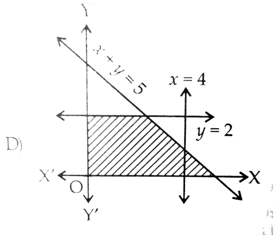
69. Shaded region of the constraints $x + y \leq 5, 0 \leq x \leq 4, 0 \leq y \leq 2$ is

A. 

B. 

C. 

D. 

Answer: C

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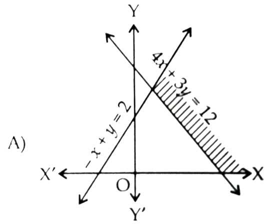
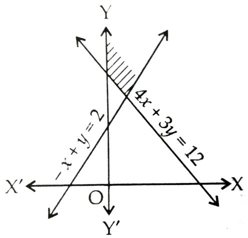
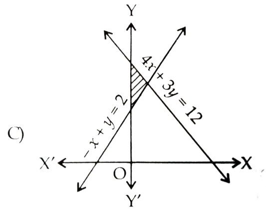
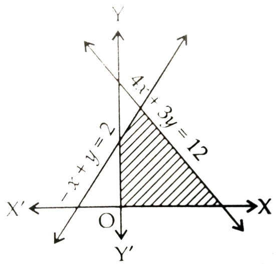
70. Shaded, region of the constraints $4x + 3y \leq 12, \ -x + y \leq 2, x \geq 0, y \geq 0$ is

A. 

B. 

C. 

D. 

Answer: D

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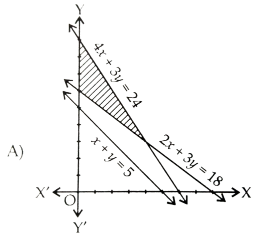
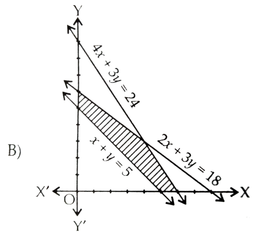
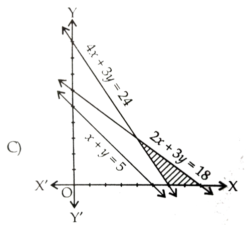
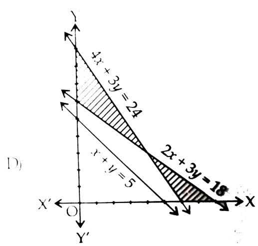
71. Shaded, region of the constraints $x + y \geq 5$, $2x + 3y \leq 18$, $4x + 3y \leq 24$, $x \geq 0$, $y \geq 0$ is

A. 

B. 

C. 

D. 

Answer: B

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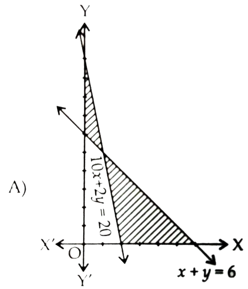
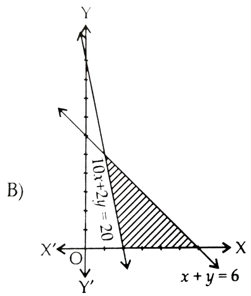
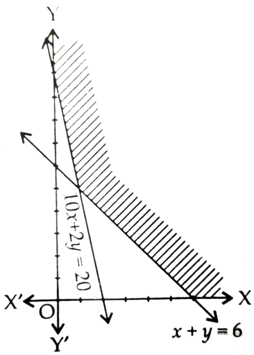
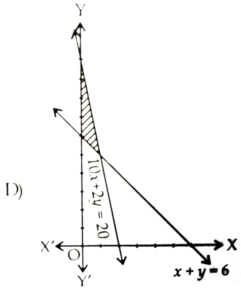
72. Shaded, region of the constraints $10x + 2y \geq 20$, $x + y \geq 6$ is

A. 

B. 

C. 

D. 

Answer: C

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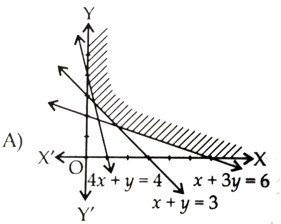
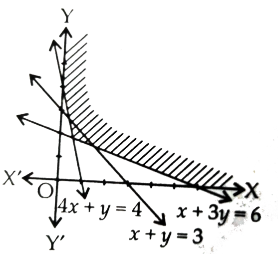
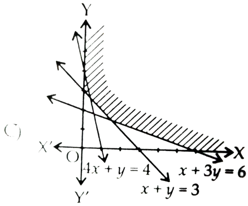
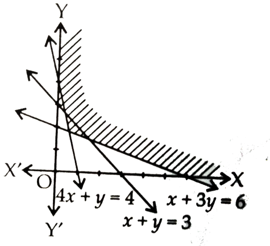
73. Shaded,region of the constraints $4x + y \geq 4, x + 3y \geq 6, x + y \geq 3, x \geq 0, y \geq 0$ is

A. 

B. 

C. 

D. 

Answer: A

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74. The solution set of the inequation $2x + y > 5$ is

A. half plane that contains the origin

B. open half plane not containing the origin

C. whole XY-plane except the points lying on line $2x + y = 5$

D. half plane not containing the origin

Answer: B

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75. The solution set of the inequation $x + 2y \geq 3$ is

A. half plane containing the origin

B. half plane not containing the origin

C. the whole XY-plane except point lying on line $x + 2y - 3 = 0$

D. open half plane not containing the origin

Answer: B

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76. The solution set of $3x + 2y \leq 6$ is

A. half plane not containing origin

B. half plane containing the points lying on line $3x + 2y = 6$ and origin

C. XY-plane except points on line $3x + 2y = 6$

D. half plane not containing the points lying on line $3x + 2y = 6$ and origin

Answer: B

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77. The solution set of the inequations $x \leq 4, x - y \geq 0, 3x + y \geq 0$

A. lies in first and second quadrants

B. lies in second and third quadrants

C. lies in third and fourth quadrants

D. lies in fourth and first quadrants

Answer: D

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78. The lines $5x + 4y \geq 20, x \leq 6, y \leq 4, x \geq 0, y \geq 0$ form

A. a square

B. a rhombus

C. a triangle

D. a quadrilateral

Answer: D

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79. The common region represented by inequalities $y \leq 2, x + y \leq 3, \; -2x + y \leq 1, x \geq 0, y \geq 0$ is

A. a triangle

B. a quadrilateral

C. a square

D. a pentagon

Answer: D

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80. The common region represented by inequalities $0 \leq x \leq 6, 0 \leq y \leq 4$ is

A. a triangle

B. a rectangle

C. a square

D. a pentagon

Answer: B

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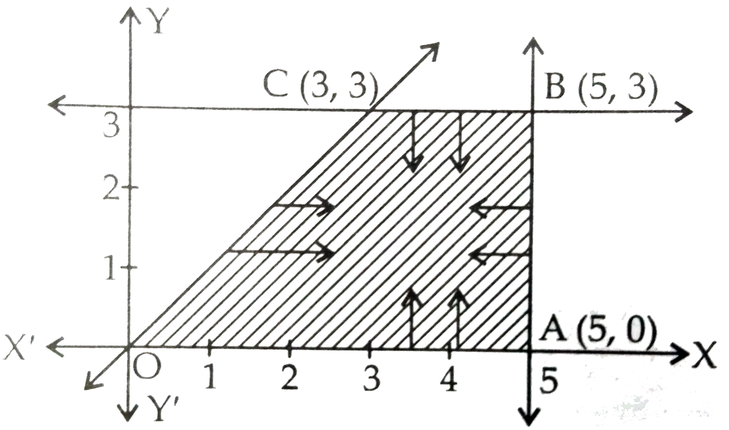
81. The shaded part of the given figure indicates the feasible region



Then the constraints are

A. $x, y \geq 0, x + y \geq 0, x \geq 5, y \leq 3$

B. $x, y \geq 0, x - y \geq 0, x \leq 5, y \leq 3$

C. $x, y \geq 0, x - y \geq 0, x \leq 5, y \geq 3$

D. $x, y \geq 0, x - y \leq 0, x \leq 5, y \leq 3$

Answer: B

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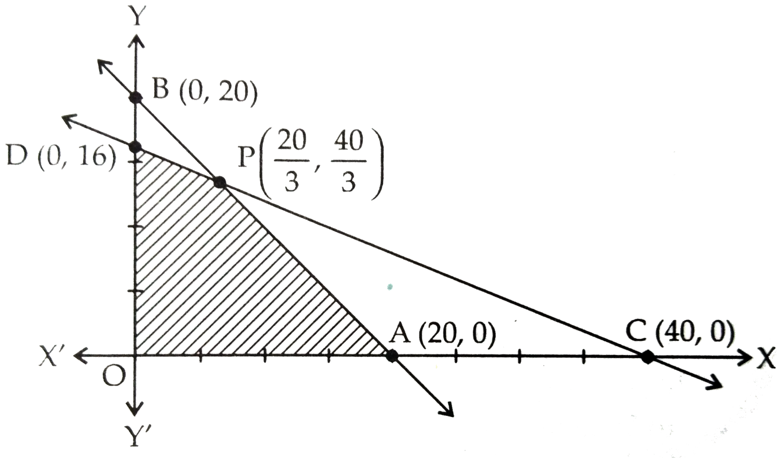
82. Feasible region is represented by



A. $2x + 5y \geq 80, x + y \leq 20, x \geq 0, y \geq 0$

B. $2x + 5y \leq 80, x + y \geq 20, x \geq 0, y \geq 0$

C. $2x + 5y \geq 80, x + y \geq 20, x \geq 0, y \geq 0$

D. $2x + 5y \leq 80, x + y \leq 20, x \geq 0, y \geq 0$

Answer: D

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83. The vertex of the linear inequalities $2x + 3y \leq 6, x + 4y \leq 4, x \geq 0, y \geq 0$ is

A. (1,0)

B. (1,1)

C. $\frac{12}{5}, \frac{2}{5}$

D. $\frac{2}{5}, \frac{12}{5}$

Answer: C

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84. The solution set of the constraints $x + y \leq 11, 3x + 2y \geq 25, 2x + 5y \geq 20, x \geq 0, y \geq 0$ includes the point

A. (2,3,)

B. (3,2)

C. (3,8)

D. (4,3)

Answer: C

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85. The corner points of common region are, if $2x+y \geq 9, x+2y \geq 9, x+y \geq 7 \text{ and } x \geq 0, y \geq 0,$

A. (9,0),(2,5),(0,9)

B. (9,0),(2,5),(2,5)

C. (9,0),(2,5),(0,9)

D. (9,0),(5,2),(2,5),(0,9)

Answer: D

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86. A company manufactures two types of chemicals A and B. Each chemical requires the types of raw materials P and Q. The table below shows number of units of P and Q required to manufacture one unit of A and one unit of B and the total availability of P and Q.

Chemical → / Raw material ↓	A	B	**Availability**
P	3	2	**120**
Q	2	5	**160**

The company gets profit of Rs. 350 and RS.400 by selling one unit of A and one unit of B respectively. If the entire production of A and B is sold, then formulate the problem as LPP.

A. Maximize $z = 350x + 400y$ subject to

$3x + 2y \geq 120,\ 2x + 5y \leq 160,\ x \geq 0,\ y \geq 0$

B. Maximize $z = 350x + 400y$ subject to

$3x + 2y \leq 120,\ 2x + 5y \geq 160,\ x \geq 0,\ y \geq 0$

C. Maximize $z = 350x + 400y$ subject to

$3x + 2y \leq 120,\ 2x + 5y \leq 160,\ x \geq 0,\ y \geq 0$

D. Maximize $z = 350x + 400y$ subject to

$3x + 2y \geq 120, 2x + 5 \geq 160, x \geq 0, y \geq 0$

Answer: C

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87. A furniture manufacturer produces tables and bookshelves made up of wood and steel. The weekly reuqirement of wood and steel is given as below.

Material → / Product ↓	Wood	Steel
Table	8	2
Book shelf	11	3

The weekly availability of wood and steel is 450 and 100 units respectively. Profit on a table is Rs.1000 and that on a book shelf is Rs. 1200. To determine the number of tables and book shelves to be produced every week in order to maximize the total profit, formulate the problem as L.P.P.

A. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \leq 450, 2x + 3y \leq 100, x \geq 0, y \geq 0$

B. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \geq 450, 2x + 3y \geq 100, x \geq 0, y \geq 0$

C. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \geq 450, 2x + 3y \leq 100, x \geq 0, y \geq 0$

D. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \leq 450, 2x + 3y \geq 100, x \geq 0, y \geq 0$

Answer: A

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88. Diet of a sick person must contains at least 4000 units of vitamins, 50 units of minerals and 2500 calories. Two foods F_1 and F_2 cost Rs. 50 and

Rs. 75 per unit respectively. Each unit of food F_1 contains 200 units of vitamins, 2 units of minerals and 40 calories, F_(2)` contains 100 units of vitamins, 3 units of minerals and 35 calories. Formulate the above problem as LPP to fulfil sick person's requirements at minimum cos.

A. Maximized $z = 50x = 75y$ subject to

$200x + 100y \geq 4000, 2x + 3y \geq 50, 40x + 35y \leq 2500, x \geq 0, y \geq 0$

B. Maximized $z = 50x = 75y$ subject to

$200x + 100y \leq 4000, 2x + 3y \geq 50, 40x + 35y \geq 2500, x \geq 0, y \geq 0$

C. Maximized $z = 50x = 75y$ subject to

$200x + 100y \geq 4000, 2x + 3y \leq 50, 40x + 35y \geq 2500, x \geq 0, y \geq 0$

D. Maximized $z = 50x = 75y$ subject to

$200x + 100y \geq 4000, 2x + 3y \geq 50, 40x + 35y \geq 2500, x \geq 0, y \geq 0$

Answer: D

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89. A printing company prints two types of magzines A and B. The company earns Rs. 20 and Rs. 30 on each copy of magazines A and B respectively. The magazine A requires 2 hours on machine I, 4 hours on Machine II and 2 hours machine III. Magazine B requires 3 hours on machine I, 5 hours on machine II and 3 hours on machine III. Machines I,II, III are available for 35, 50 and 70 hours per week respectively. Formulate the LPP to determine weekly production of magazines A and B, so that the total profit is maximum

A. Maximize $z = 20x + 3y$ subject to

$2x + 3y \leq 35$, $4x + 5y \leq 50$, $2x + 3y \geq 70$, $x \geq 0$, $y \geq 0$

B. Maximize $z = 20x + 3y$ subject to

$2x + 3y \leq 35$, $4x + 5y \leq 50$, $2x + 3y \leq 70$, $x \geq 0$, $y \geq 0$

C. Maximize $z = 20x + 3y$ subject to

$2x + 3y \leq 35$, $4x + 5y \geq 50$, $2x + 3y \leq 70$, $x \geq 0$, $y \geq 0$

D. Maximize $z = 20x + 3y$ subject to

$2x + 3y \geq 35$, $4x + 5y \leq 50$, $2x + 3y \leq 70$, $x \geq 0$, $y \geq 0$

Answer: B

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90. A dealer wishes to purchase table fans and ceiling fans. He has Rs. 57,600 to invest, and has space to store 40 items. A table fan costs Rs. 750 and ceiling fan costs Rs. 900. He can make profits of Rs. 70 and Rs. 90 by selling a table fan and a ceiling fan respectively. If dealer sell all the fans that he buy, the formulate this problem as LPP, to maximize the profit.

A. Maximize $z = 70x + 90y$ subject to

$750x + 900y \leq 57600, x + y \leq 40, x \geq 0, y \geq 0$

B. Maximize $z = 70x + 90y$ subject to

$750x + 900y \geq 57600, x + y \leq 40, x \geq 0, y \geq 0$

C. Maximize $z = 70x + 90y$ subject to

$750x + 900y \leq 57600, x + y \geq 40, x \geq 0, y \geq 0$

D. Maximize $z = 70x + 90y$ subject to

$750x + 900y \geq 57600, x + y \geq 40, x \geq 0, y \geq 0$

Answer: A

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91. Shalmali wanto to invest Rs. 50,000 in saving certificates and PPF. She went to invest at least Rs. 15,000 in saving certificates and at least Rs. 20,000 in PPF. The rate of interest on saving certificates is 8% p.a. and on PPF is 9% p.a. Formulate the LPP for maximun yearly income.

A. Maximize $z = 0.08x + 0.09y$ subject to

$x + y \leq 50000, x \leq 15000, y \geq 20000, x \geq 0, y \geq 0$

B. Maximize $z = 0.08x + 0.09y$ subject to

$x + y \leq 50000, x \geq 15000, y \leq 20000, x \geq 0, y \geq 0$

C. Maximize $z = 0.08x + 0.09y$ subject to

$x + y \leq 50000, x \geq 15000, y \geq 20000, x \geq 0, y \geq 0$

D. Maximize $z = 0.08x + 0.09y$ subject to

$x + y \leq 50000, x \leq 15000, y \leq 20000, x \geq 0, y \geq 0$

Answer: C

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92. If a motorcyclist rides at a speed of 50 km/hr, he has to spend Rs. 2 per km on petrol. If he rides at a faster speed of 70 km/hr, the petrol cost increases to Rs. 2.5 per km. He has Rs. 500 To spend on petrol and wishes to travel maximum distance within an hour. Formulate as LPP.

A. Maximize $z = x + y$ subject to

$\frac{x}{50} + \frac{y}{70} \leq 1, 2x + 2.5y \geq 500, x \geq 0, y \geq 0$

B. Maximize $z = x + y$ subject to

$\frac{x}{50} + \frac{y}{70} \leq 1, 2x + 2.5y \leq 500, x \geq 0, y \geq 0$

C. Maximize $z = x + y$ subject to

$\frac{x}{50} + \frac{y}{70} \geq 1, 2x + 2.5y \leq 500, x \geq 0, y \geq 0$

D. Maximize $z = x + y$ subject to

$$\frac{x}{50} + \frac{y}{70} \geq 1, 2x + 2.5y \geq 500, x \geq 0, y \geq 0$$

Answer: B

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93. Two different kinds of foods A and B are being considered to form a weekly diet. The minimum weekly requirment of fats, carbohydrates and proteins are 17,28 and 14 units respectively. One kg of food A has 5 units of fat, 12 units of carbohydrates and 7 units of protein. One kg of food B has 7 units of fat, 15 units of carbohydrates and 9 units of protein. The price of food A is Rs. 5 per kg. and that of food B is Rs. 7 per kg. Form the LPP to minimize the cost.

A. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \leq 17, 12x + 15y \geq 28, 7x + 9y \geq 14, x \geq 0, y \geq 0$$

B. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \geq 17, 12x + 15y \leq 28, 7x + 9y \geq 14, x \geq 0, y \geq 0$$

C. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \geq 17, 12x + 15y \geq 28, 7x + 9y \leq 14, x \geq 0, y \geq 0$$

D. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \geq 17, 12x + 15y \geq 28, 7x + 9y \geq 14, x \geq 0, y \geq 0$$

Answer: D

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94. A shop keeper sells to two items, colour T.V. sets and DVD players. He can invest Rs. 12,00,000 and can store only 750 items. The cost of color TV and DVD player is Rs. 6500 and Rs. 2800 respectively. He can sell these items at a price of Rs. 8600 and Rs. 3900 respectively. Form the LPP to maximize the profit.

A. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \leq 1200000, x + y \geq 750, x \geq 0, y \geq 0$

B. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \leq 1200000, x + y \leq 750, x \geq 0, y \geq 0$

C. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \geq 1200000, x + y \leq 750, x \geq 0, y \geq 0$

D. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \geq 1200000, x + y \geq 750, x \geq 0, y \geq 0$

Answer: B

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95. A factory makes two types of biscuit B_1 and B_2 that cost Rs. 145 and Rs. 160 per kg. respectively. The minimum quantities of flour, sugar and butter to be ordered for the for the factory are 600kg, 400 kg and 250 kg respectively to make the biscuits. Variety B_1 requires 700 gms of flour, 200 gms of sugar and 100 gms. of butter to prepare 1 kg of biscuits. The variety B_2 requires 600 gms of flour, 300 gms of sugar and 200 gms of butter to prepare 1 kg of biscuits. Formulate the above LPP to minimize the cost.

A. Minimize $z = 145x + 160y$ subject to $0.7x + 0.6y \geq 600, 0.2x + 0.3y \geq 400, 0.1x + 0.2y \geq 250, x \geq 0, y \geq$

B. Minimize $z = 145x + 160y$ subject to $0.7x + 0.6y \geq 600, 0.2x + 0.3y \geq 400, 0.1x + 0.2y \leq 250, x \geq 0, y \geq$

C. Minimize $z = 145x + 160y$ subject to $0.7x + 0.6y \geq 600, 0.2x + 0.3y \leq 400, 0.1x + 0.2y \geq 250, x \geq 0, y \geq$

D. Minimize $z = 145x + 160y$ subject to $0.7x + 0.6y \leq 600, 0.2x + 0.3y \geq 400, 0.1x + 0.2y \geq 250, x \geq 0, y \geq$

Answer: A

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96. An aeroplane can carry a maximum of 250 passengers. A profit of Rs. 1500 is made on each executive class ticket and a profit of Rs. 900 made on each economy class ticket. the airline reserves at least 30 seats ofr executive class. However at least 4 times as many passengers perfer to travel by economomy class than by excutive class. Formulate LPP in order to maximize the profit for the airline.

A. Minimize $z = 1500x + 900y$ subject to

$x + y \leq 250, x \leq 30, y \geq 4x, x \geq 0, y \geq 0$

B. Minimize $z = 1500x + 900y$ subject to

$x + y \leq 250, x \geq 30, y \geq 4x, x \geq 0, y \geq 0$

C. Minimize $z = 1500x + 900y$ subject to

$x + y \geq 250, x \geq 30, y \geq 4x, x \geq 0, y \geq 0$

D. Minimize $z = 1500x + 900y$ subject to

$x + y \geq 250, x \geq 30, y \geq 4x, x \geq 0, y \geq 0$

Answer: B

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97. Two tailors P and Q earn Rs. 350 and Rs. 450 per day respectively. Tailor P can stitch 6 shirts and 3 trousers while tailor Q can stitch 7 shirts and 3 trousers per day. Formulate the LPP, if it is desired to produce at least 51 shrits and 24 trousers at a minimum labour cost?

A. Minimize $z = 350x + 450y$ subject to $6x + 7y \leq 51, 3x + 3y \geq 24, x \geq 0, y \geq 0$

B. Minimize $z = 350x + 450y$ subject to $6x + 7y \geq 51, 3x + 3y \leq 24, x \geq 0, y \geq 0$

C. Minimize $z = 350x + 450y$ subject to $6x + 7y \geq 51, 3x + 3y \geq 24, x \geq 0, y \geq 0$

D. Minimize $z = 350x + 450y$ subject to $6x + 7y \leq 51, 3x + 3y \leq 24, x \geq 0, y \geq 0$

Answer: C

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98. A diet of sick person contains at least 48 units of vitamin A and 64 uints of vitamin B. Two foods F_1 and F_2 are available . Food F_1 costs Rs. 6 per unit and food F_2 costs Rs. 10 per unit. One unit of food F_1 contains 6 units of vitamin A and 7 units of vitamin B. One unit of of food F_2 contain 8 units of vitamin A and 12 units of vitamin B. Formulate the LPP, for the minimum cost for the diet that consists of mixture of these two foods and also meeting the minimal nutrition requirements

A. Minimize $z = 6x + 10y$ subject to $6x + 8y \leq 48, 7x + 12y \geq 64, x \geq 0, y \geq 0$

B. Minimize $z = 6x + 10y$ subject to $6x + 8y \geq 48, 7x + 12y \leq 64, x \geq 0, y \geq 0$

C. Minimize $z = 6x + 10y$ subject to $6x + 8y \geq 48, 7x + 12y \geq 64, x \geq 0, y \geq 0$

D. Minimize $z = 6x + 10y$ subject to $6x + 8y \leq 48, 7x + 12y \leq 64, x \geq 0, y \geq 0$

Answer: C

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99. The construction company uses concrete blocks made up of cement and sand. The weight of a concrete block has to be at least 5kg. Cement costs Rs. 20 per kg. while sand costs Rs. 6 per kg. Strength consideration dictate that the concrete block should contain minimum 4 kg. of cement and not more than 2 kg. of sand. Form the LPP for the cost to be minimum.

A. Maximize $z = 20x + 6y$ subject to $x + y \geq 5, x \leq 4, y \leq 2, x \geq 0, y \geq 0$

B. Maximize $z = 20x + 6y$ subject to $x + y \geq 5, x \leq 4, y \geq 2, x \geq 0, y \geq 0$

C. Maximize $z = 20x + 6y$ subject to $x + y \geq 5, x \geq 4, y \geq 2, x \geq 0, y \geq 0$

D. Maximize $z = 20x + 6y$ subject to

$x + y \geq 5, x \geq 4, y \leq 2, x \geq 0, y \geq 0$

Answer: D

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100. An owner of a lodge plans a extension which contains not more than 50 rooms. At least 5 must be executive single rooms. The number of executive double rooms should be at least 3 times the number of executive single rooms. He charges Rs. 1800 for executive single rooms per day and Rs.3000 for executive double room. Formulate the above problem as LPP to maximize the profit.

A. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \geq 5, y \leq 3x, x \geq 0, y \geq 0$

B. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \leq 5, y \geq 3x, x \geq 0, y \geq 0$

C. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \geq 5, y \geq 3x, x \geq 0, y \geq 0$

D. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \leq 5, y \leq 3x, x \geq 0, y \geq 0$

Answer: A

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101. The objective function off LPP defined over the convex set attains it optimum value at

A. at least two of the corner points

B. all the corner points

C. at least one of the corner points

D. none of the corner points

Answer: C

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