MATHS

BOOKS - MARVEL MATHS (HINGLISH)

LINEAR PROGRAMMING PROBLEM [L.P.P] (OPTIMIZATION TECHNIQUES)

Mcq

1. if $x + y \leq 2, x \geq 0$ then point at which maximum value of 3x + 2y attained will be

A. (0, 0)

B. (1.5, 1.5)

C. (2,0)

D. (0,2)

Answer: C

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2. Maximum value of $Z = 15x + 20y$

subject to $3x + 4y \leq 10, x \geq 0, y \geq 0$ is

A. 46

B. 50

C. 60

D. 67

Answer: B

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3. Maximum value of $p = 6x + 8y$

subject to $2x + y \leq 30, x + 2y \leq 24, x \geq 0, y \geq 0$

is

A. 90

B. 120

C. 96

D. 240

Answer: B

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4. Maximum value of $Z = 3x + 4y$

subject to $x - y \leq -1, -x + y \leq 0, x \geq 0, y \geq 0$

is

A. 1

B. 4

C. 6

D. 7

Answer: B

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5. The maximum value of Z =x +3y such that $2x + y \leq 20, x + 2y \leq 20, x \geq 0, y \geq 0$ is

A. 10

B. 60

C. 30

D. 4

Answer: C

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6. The point which provides the solution to the LPP :

Maximize $2x + 3y$ subject to constraints $x \geq 0, y \geq 0, 2x + 2y \leq 9, 2x + y \leq 7, x + 2y \leq 8$ is

A. (3, 2.5)

B. (2, 3.5)

C. (2, 2.5)

D. (1, 3.5)

Answer: D

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7. The maximum value of Z = 4x + 2y subject to the constraints $2x + 3y \leq 18, x + y \geq 10, x, y \geq 0$ is

A. 36

B. 40

C. 30

D. not defined

Answer: D

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8. The maximum value $P = 3x + 4y$ subjected to the constraints

$x + y \leq 40, x + 2y \leq 60, x \geq 0$ and $y \geq 0$ is

A. 120

B. 140

C. 100

D. 160

Answer: B

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9. Solution set of the constraints

$x + 2y \geq 11, 3x + 4y \leq 30, 2x + 5y \leq 30, x \geq 0, y \geq 0$

includes the point

A. (2, 3)

B. (3,2)

C. (3, 4)

D. (4, 3)

Answer: C

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10. Inequations $3x - y \geq 3$ and $4x - y \geq 4$

A. have solution for positive x and y

B. have no solution for positive x and y

C. have solution for all x

D. have solution for all y

Answer: A

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11. Optimum solution of the L.P.P. :

Maximize $z = 3x + 5y$

subject to $3x + 2y \leq 18, x \leq 4, y \leq 6, x \geq 0, y \geq 0$

is

A. $x = 2, y = 0, z = 6$

B. $x = 2, y = 6, z = 36$

C. $x = 4, y = 3, z = 27$

D. $x = 4, y = 6, z = 42$

Answer: B

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

A. the points of intersection of inequations with both the axes

B. the points of intersection of inequations with X-axis only

C. the corner points of the feasible region

D. the points of intersection of inequations with Y-axis only

Answer: C

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13. Maximum of $P = 5x + 3y$ subject to the constraints:

$x \geq 0, y \geq 0, 5x + 2y \leq 10$ is

A. 6

B. 10

C. 15

D. 25

Answer: C

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14. Maximum of $P = 6x + 11y$ sujbect ot the constraints:

$2x + y \leq 104, x + 2y \leq 76, x \geq 0, y \geq 0$ is

A. 440

B. 540

C. 240

D. 170

Answer: A

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15. Maximize $P = 8x + 3y$ subject to the constraints:

$x + y \leq 3, 4x + y \leq 6, x \geq 0, y \geq 0$ is

A. 9

B. 12

C. 14

D. 16

Answer: C

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16. Maximum of $P = 5x + 7y$ subject to the constraints :

$3x + 2y \leq 12, 2x + 3y \leq 13, x \geq 0, y \geq 0$ is

A. $91/3$

B. 31

C. 20

D. 120

Answer: B

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17. Given

$A \equiv (3, 2), B \equiv (4, 0), C \equiv (1, 1)$ and $D \equiv (0, 4)$.

Then, the optimal solution of the L.P.P.

Maximize $Z = 38x + 19y$

subject to $2x + 3y \leq 12, 2x + y \leq 8, x \geq 0, y \geq 0$

takes place at the points

A. A and B

B. only C

C. only D

D. C and D

Answer: A

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18. Which of the following statements is true?

A. Every L.P.P. has an optimal solution.

B. An L.P.P. has a unique solution.

C. If an L.P.P. has two optimal solutions, then it has infinitely many optimal solutions.

D. Every L.P.P. has two optimal solutions.

Answer: C

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19. Which of the following sets is not convex?

A. $\{(x, y) \mid 2x + 5y < 7\}$

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

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

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

Answer: C

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20. For the L.P.P. :

Maximize $Z = 5x + 3y$

subject to

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

the number of feasible solutions (points) is

A. 1

B. 3

C. 4

D. infinitely many

Answer: A

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21. For the L.P.P. :

Maximize $Z = x + y$

subject to $x + y \leq 1, 2x + 2y \geq 6, x \geq 0, y \geq 0,$

the number of feasible solutions is

A. 1

B. 2

C. 0

D. infinite

Answer: C

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22. Minimum of $C = x + 3y$

subject to

$2x + y \geq 6, x + y \geq 4, x \leq y, x \geq 0, y \geq 0$ is

A. 7

B. 8

C. 10

D. 6

Answer: B

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23. Minimum of $Z = 5x + 8y$

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

A. 28

B. 13

C. 0

D. 52

Answer: A

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24. Minimum of $Z = 12x + 20y$

subject to $x + y \geq 7, 5x + 2y \geq 20, x \geq 0, y \geq 0$ is

A. 32

B. 84

C. 52

D. 64

Answer: B

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25. The L.P.P. :

Maximize $Z = 4x - 10y$

subject to $2x - y \leq 2, x - 4y \geq 4, x \geq 0, y \geq 0$ has

A. infinitely many optimal solutions

B. only two optimal solutions

C. only one optimal solution

D. no optimal solution

Answer: D

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26. The shape of the region determined by $2x + 6y \geq 12, 3x + 2y \geq 6, x + y \leq 8, x \geq 0, y \geq 0$:

A. triangle

B. quadrilateral

C. pentagon

D. hexagon

Answer: C

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27. If $z = 9x + 13y$, then maximum z,

subject to $2x + 3y \leq 18, 2x + y \leq 10, x \geq 0, y \geq 0$

is :

A. 79

B. 78

C. 81

D. 90

Answer: A

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28. The maximum value of the objective function $Z = 3x + 2y$ for linear constraints $x + y \leq 7, 2x + 3y \leq 16, x \geq 0, y \geq 0$ is

A. 16

B. 21

C. 25

D. 28

Answer: B

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29. The optimum value of $Z = 5x + 2y$ subject to $5x + y \geq 10, x + y \geq 6, x \geq 0, y \geq 0$ is

A. 14

B. 15

C. 16

D. 20

Answer: B

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Test Your Grasp

1. Which of the following to is the common region for

$x + y \leq 10, x \geq 5, y \leq 10, x \geq 0$ and $y \geq 0$.

A. 

B. 

C. 

D. 

Answer:

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2. The common region for :

$x + y \geq 2, x + 3y \leq 9, x \leq 2, y \leq 2, x \geq 0, y \geq 0$:

A. 

B. 

C. 

D. 

Answer:

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3. Solution set of the inequalities

$x + 2y \geq 11, 3x + 4y \leq 30, 2x + 5y \leq 30, x \geq 0, y \geq 0$

includes the point

A. (4, 3)

B. (2, 2)

C. (3, 4)

D. (1, 5)

Answer:

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4. If $3x + 4y \geq 12, 2x + y \leq 6, x \geq 0, y \geq 0,$ then the corner points of the feasible region are

A. (6, 0), (3, 0), (2, 5)

B. $(0, 6), (0, 3), \left(\frac{12}{5}, \frac{6}{5}\right)$

C. $(0, 6), (3, 0)\left(\frac{12}{5}, \frac{6}{5}\right)$

D. $(6, 0), (3, 0), \left(\frac{12}{5}, \frac{6}{5}\right)$

Answer:

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5. If $2x + 5y \leq 16, 6y \leq 30, x \geq 0, y \geq 0,$ then maximum of $z = 2x + 10y$ is

A. 15

B. 32

C. 30

D. 16

Answer:

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6. If $0 \leq x \leq 4, 0 \leq y \leq 8, x + y \leq 8,$ then maximum of $z = 5x + 3y$ is

A. 35

B. 40

C. 32

D. 30

Answer:

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7. If

$5x + y \geq 10, 2x + 2y \geq 12, x + 4y \geq 12, x \geq 0, y \geq 0$

, then minimum of $z = 4x + 5y$ is

A. 25

B. 36

C. 16

D. 26

Answer:

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8. If $10x + 2y \geq 20, 5x + 5y \geq 30, x \geq 0, y \geq 0,$ then minimum of $z = 5x + 2y$ is

A. 20

B. 18

C. 10

D. 15

Answer:

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9. Maximum value of $Z = 15x + 20y$

subject to $3x + 4y \leq 10, x \geq 0, y \geq 0$ is

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B. 50

C. 60

D. 67

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B. 40

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Answer:

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