Multiple Choice Questions

[MHT-CET 2022] (online shift)

1. The maximum value of $z = 50x + 15y$, s. t. c. $x + y \le 60$; $5x + y \le 100$; $y \ge 0, x \ge 0$ is .... at the point ....

a) 1000, (20, 0) b) 2650, (50, 10) c) 1250 (10, 50) d) 900 (0, 60)

2. The objective function of L.P.P. defined over the convex set attains its optimum value at

a) none of the corner points b) at least one of the corner points

c) at least two of the corner points d) all the corner points

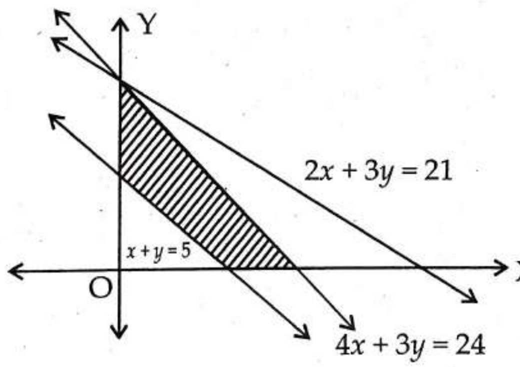
3. The maximum value of the objective function $z = 4x + 5y$ s.t.c. $2x + 3y \le 12$; $2x + y \le 8$ and $x \ge 0, y \ge 0$.

a) 21 b) 22 c) 24 d) 23

4. For the inequalities $x + y \le 3$, $2x + 5y \ge 10$; $x \ge 0, y \ge 0$. Which of the following points lies in the feasible region ?

a) (2, 2) b) (1, 2) c) (4, 2) d) (2, 1)

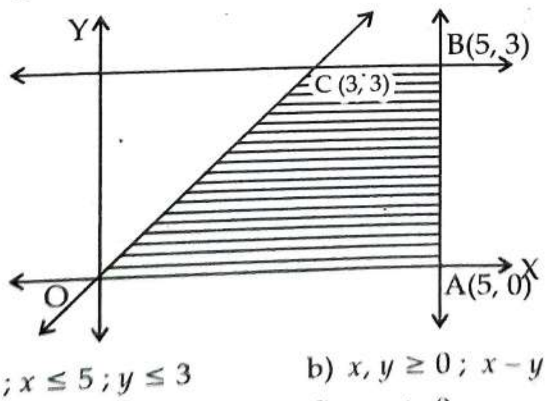
5. The function to be maximized is given by $z = 2x + y$. The feasible region for this function z is the shaded region given below. The maximum value of z is .... and occurs at the point ....



a) 21, (10.5, 0) b) 9, (1.5, 6) c) 10 (5, 0) d) 12, (6, 0)

[MHT-CET 2021] (online shift)

6. The shaded part of the given figure indicates the feasible region. Then the constraints are



a) $x, y \ge 0$; $x - y \ge 0$; $x \le 5$; $y \le 3$ b) $x, y \ge 0$; $x - y \ge 0$; $x \le 5$; $y \ge 3$

c) $x, y \ge 0$; $x + y \ge 0$; $x \ge 5$; $y \le 3$ d) $x, y \ge 0$; $x - y \ge 0$; $x \ge 5$; $y \le 3$

7. The maximum value of $z = 10x + 25y$ subject to $0 \le x \le 3$; $0 \le y \le 3$; $x + y \le 5$ occurs at point.

a) (3, 2) b) (2, 3) c) (4, 3) d) (5, 4)

8. The common region of the solution of the inequation $x + y \geq 5 ; y \leq 4, x \geq 2, x, y \geq 0$ is

a) unbounded and non - origin side b) unbounded and origin side

c) bounded and origin side d) bounded and non-origin side

9. The maximum value of the objective function $z = 2x + 3y$ s.t.c. $x + y \leq 5 ; 2x + y \geq 4$ and $x \geq 0, y \geq 0$ is

a) 15 b) 10 c) 20 d) 25

10. The region represented by the inequalities $x \geq 6, y \geq 3, 2x + y \geq 10, x \geq 0, y \geq 0$ is

a) origin side of all the inequalities b) unbounded

c) polygon d) bounded

[MHT-CET 2020]

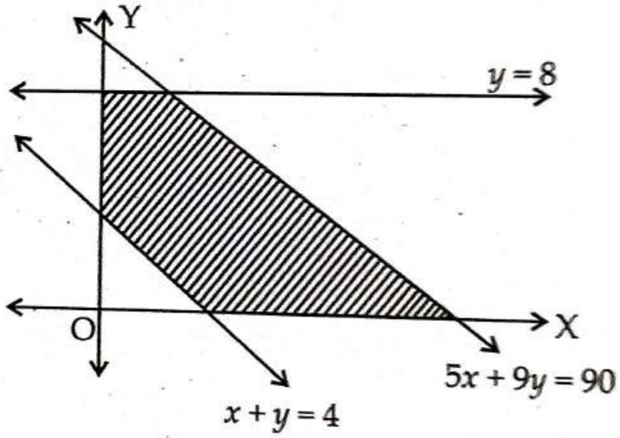
11. If $z = 7x + y$ subject to $5x + y \geq 5 ; x + y \geq 3, x \geq 0, y \geq 0$ then minimum value of z is

a) 5 b) 2 c) 6 d) 3

12. If $z = 10x + 25y$ subject to $0 \leq x \leq 3 ; 0 \leq y \leq 3 ; x + y \leq 5 ; x \geq 0, y \geq 0$ then z is maximum at the point

a) (2, 3) b) (2, 4) c) (1, 6) d) (4, 3)

13. For the following shaded region the linear constraints are



a) $5x + 9y \geq 90 ; x + y \leq 4 ; y \leq 8 ; x, y \geq 0$ b) $5x + 9y \leq 90 ; x + y \leq 4 ; y \leq 8 ; x, y \geq 0$

c) $5x + 9y \geq 90 ; x + y \geq 4 ; y \geq 8 ; x, y \geq 0$ d) $5x + 9y \leq 90 ; x + y \geq 4 ; y \leq 8 ; x, y \geq 0$

14. The L.P.P. to minimize $z = x + y$ s.t. $x + y \leq 30 ; x \leq 15 ; y \leq 20 , x + y \geq 15, x, y \geq 0$ has

a) unbounded solution b) infinite solution

c) no solution d) a unique solution

15. The maximum value of $z = 10x + 25y$ subject to $0 \leq x \leq 3 ; 0 \leq y \leq 3, x + y \leq 5, x \geq 0, y \geq 0$ is

a) 120 b) 110 c) 95 d) 100

[MHT-CET 2019]

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

a) 95 b) 80 c) 105 d) 30

17. The maximum value of $z = 9x + 11y$ subject to $3x + 2y \leq 12 ; 2x + 3y \leq 12 ; x, y \geq 0$ is

a) 44 b) 36 c) 48 d) 54

18. For L.P.P. maximize $z = 4x_1 + 2x_2$ subject to $3x_1 + 2x_2 \geq 9 ; x_1 - x_2 \leq 3, x_1 \geq 0, x_2 \geq 0$ has

a) no solution b) unbounded solution

c) one optimal solution d) infinite number of optimal solutions

19. If $z = ax + by : a, b \geq 0$ subject to $x \leq 2 ; y \leq 2 , x + y \geq 3 ; x \geq 0, y \geq 0$ has minimum value at (2, 1) only then
a) $a < b$ b) $a > b$ c) $a = b$ d) $a = 1 + b$

20. Maximum value of $z = 4x + 5y$ subject to $y \leq 2x, x \leq 2y, x + y \leq 3, x \geq 0, y \geq 0$ is
a) 14 b) 20 c) 28 d) 13

[MHT-CET 2018]

21. The maximum value of $2x + y$ subject to $3x + 5y \leq 26$ and $5x + 3y \leq 30 ; x \geq 0, y \geq 0$ is
a) 12 b) 11.5 c) 10 d) 17.33

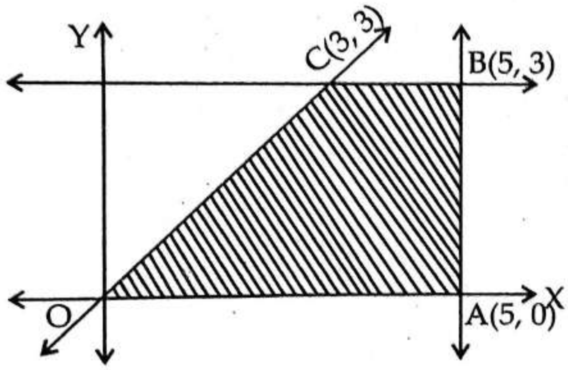
[MHT-CET 2017]

22. 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

23. The objective function of L.P.P. defined over the convex sets attains its 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

[MHT-CET 2016]

24. The shaded part of 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) $x, y \geq 0 ; x - y \leq 0 ; x \leq 5 ; y \leq 3$

25. The objective function $z = x_1 + x_2$ subject to $x_1 + x_2 \leq 10 ; - 2x_1 + 3x_2 \leq 15, x_1 \leq 6 ;$ $x_1 x_2 \geq 0$ has maximum value .... of the feasible region.
a) at only one point
b) at only two points
c) at every point on the segment joining two points
d) at every point of the line joining two points

[MHT-CET 2013]

26. If $z = 10x + 25y$ subject to $0 \leq x \leq 3 ; 0 \leq y \leq 3 ; x + y \leq 5$ then the maximum value of z is
a) 80 b) 95 c) 30 d) 75

[MHT-CET 2012]

27. The feasible region represented by the inequation $2x + 3y \leq 18 ; x + y \geq 10 ; x \geq 0, y \geq 0$ is
a) an empty set b) unbounded c) bounded d) a finite set

[MHT-CET 2011]

28. The constraints $- x_1 + x_2 \leq 1, - x_1 + 3x_2 \leq 9, x_1 x_2 \geq 0$ are defined on
a) bounded feasible space
b) unbounded feasible space
c) both 'a' and 'b'
d) none of the above

[MHT-CET 2010]

29. The maximum value of $z = 3x + 2y$ subject to $x + y \le 7$; $2x + 3y \le 16$; $x \ge 0, y \ge 0$ is
   a) 23 b) 19 c) 21 d) 24

[MHT-CET 2009]

30. Maximum value of $z = 9x + 13y$ subject to $2x + y \le 10$; $2x + 3y \le 18$ and $x \ge 0, y \ge 0$ is
   a) 41 b) 78 c) 89 d) 79

[MHT-CET 2008]

31. For the L.P.P. min $z = x_1 + x_2$ such that inequalities $5x_1 + 10x_2 \ge 0$; $x_1 + x_2 \le 1, x_2 \le 4$ and $x_1, x_2 \ge 0$
   a) There is a bounded solution b) There is no solution
   c) There is infinite solution d) none of the above

[MHT-CET 2007]

32. Which of the terms is not used in a Linear programming problem ?
   a) optimal solution b) feasible solution c) concave region d) objective function

33. The constraints $-x_1 + x_2 \le 1$; $-x_1 + 3x_2 \le 9$; $x_1x_2 \ge 0$ defines on
   a) bounded feasible space b) unbounded feasible space
   c) both 'a' and 'b' d) none of the above

[MHT-CET 2006]

34. If the constraints of L.P.P. are changed then the value of objective function
   a) has to be revaluated b) becomes zero
   c) remains the same d) none of these

35. Non-negative constraints for an L.P.P. should be
   a) $= 0$ b) < 0 c) ≥ 0 d) neither > 0 nor < 0

[MHT-CET 2005]

36. Minimize $z = 30x + 20y$ subject to $x + y \le 8$; $x + 2y \ge 4$, $6x + 4y \ge 12$, $x \ge 0$, $y \ge 0$
   a) Infinite solution b) Unique solution c) Two solutions d) none of these

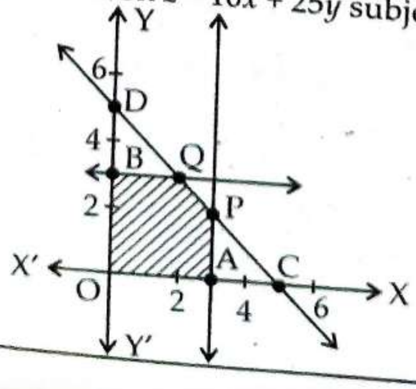
[MHT-CET 2004]

37. Inequality $x + 5y \le 6$ lies
   a) on origin side of $x + 5y = 6$ b) on non - origin side of $x + 5y = 6$
   c) on either side of the $x + 5y = 6$ d) none of these

38. L.P.P. includes
   a) Both objective function and constraints which are linear
   b) Objective functions which are linear
   c) Constraints which are linear
   d) None of these

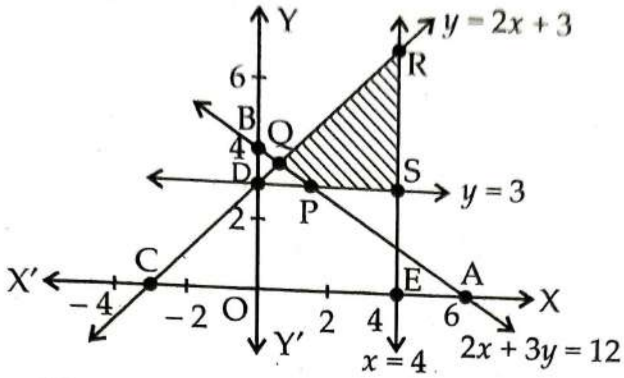
[MHT - CET 2023]

39. The shaded area in the given figure is a solution set for some system of inequations. The maximum value of the function $z = 10x + 25y$ subject to the linear constraints given by the system is



a) 80 b) 95 c) 100 d) 105

40. The shaded area in the figure below is the solution set of a system of inequations. The minimum value of the objective function $z = 3x + 5y$, subject to the linear constraints given by this system of inequations is



a) 15 b) 19.5 c) 19.8 d) 21

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

a) a triangle b) a rectangle c) a square d) a pentagon

42. The common region represented by inequalities $y \le 2, x + y \le 3, -2x + y \le 1, x \ge 0, y \ge 0$ is

a) a triangle b) a quadrilateral c) a square d) a pentagon

43. The vertices of the feasible region for the constraints $x + y \le 4, x \le 2, y \le 1, x + y \ge 1$ and $x \ge 0, y \ge 0$ are

a) (1, 0), (2, 0), (0, 4), (2, 1) b) (1, 0), (2, 0), (0, 1), (2, 1)

c) (1, 0), (4, 0), (0, 1), (2, 1) d) (1, 0), (2, 0), (0, 2), (2, 1)

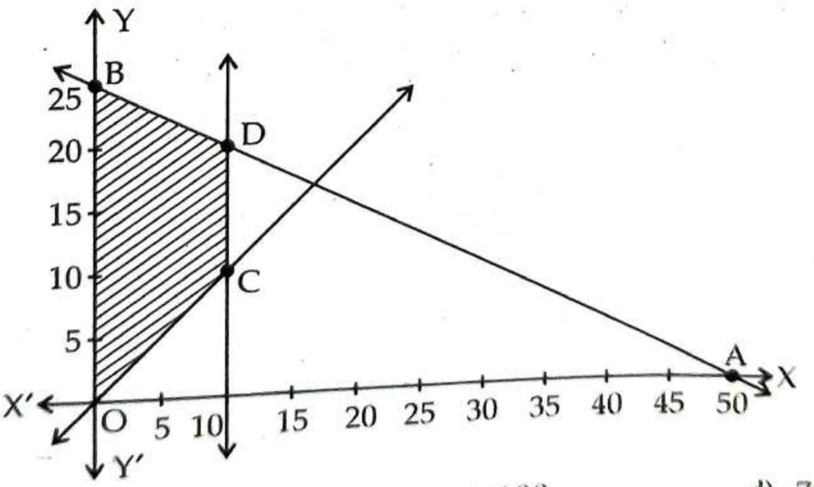
[MHT - CET 2024]

44. The maximum value of $z = x + y$ subject to $x + y \le 10, 5x + 3y \ge 15, x \le 6, x \ge 0, y \ge 0$ is

a) occurs only at unique point b) occurs only at two distinct points

c) occurs at infinitely many points d) does not exist

45. For the feasible region OCDBO given below, the maximum value of $z = 3x + 4y$ is



a) 130 b) 110 c) 100 d) 70