



ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION



Solution of Worksheet-25

SUBJECT – MATHEMATICS

2nd-term

Chapter: Calculus

Class: XII

Topic : LPP

Date: 14.11.2020

Choose the correct option

(1 X 15= 15)

- The solution set of the inequation $2x + y > 5$ is
 - half plane that contains the origin
 - open half plane not containing the origin
 - whole xy -plane except the points lying on the line $2x + y = 5$
 - none of these
- Objective function of a LPP is
 - a constraint
 - a function to be optimized
 - a relation between the variables
 - none of these
- Which of the following sets are convex?
 - $\{(x, y) : x^2 + y^2 \geq 1\}$
 - $\{(x, y) : y^2 \geq x\}$
 - $\{(x, y) : 3x^2 + 4y^2 \geq 5\}$
 - $\{(x, y) : y \geq 2, y \leq 4\}$
- Let X_1 and X_2 are optimal solutions of a LPP, then
 - $X = \lambda X_1 + (1 - \lambda) X_2$, $\lambda \in R$ is also an optimal solution
 - $X = \lambda X_1 + (1 - \lambda) X_2$, $0 \leq \lambda \leq 1$ gives an optimal solution
 - $X = \lambda X_1 + (1 + \lambda) X_2$, $0 \leq \lambda \leq 1$ give an optimal solution
 - $X = \lambda X_1 + (1 + \lambda) X_2$, $\lambda \in R$ gives an optimal solution
- The maximum value of $Z = 4x + 2y$ subjected to the constraints $2x + 3y \leq 18$, $x + y \geq 10$; $x, y \geq 0$ is
 - 36
 - 40
 - 20
 - none of these
- The optimal value of the objective function is attained at the points
 - given by intersection of inequations with the axes only
 - given by intersection of inequations with x -axis only
 - given by corner points of the feasible region
 - none of these
- The maximum value of $Z = 4x + 3y$ subjected to the constraints $3x + 2y \geq 160$, $5x + 2y \geq 200$, $x + 2y \geq 80$; $x, y \geq 0$ is
 - 320
 - 300
 - 230
 - none of these
- Consider a LPP given by
Minimum $Z = 6x + 10y$
Subjected to $x \geq 6$; $y \geq 2$; $2x + y \geq 10$; $x, y \geq 0$
Redundant constraints in this LPP are
 - $x \geq 0, y \geq 0$
 - $x \geq 6, 2x + y \geq 10$
 - $2x + y \geq 10$
 - none of these

9. The objective function $Z = 4x + 3y$ can be maximised subjected to the constraints $3x + 4y \leq 24$, $8x + 6y \leq 48$, $x \leq 5$, $y \leq 6$; $x, y \geq 0$
- (a) at only one point (b) at two points only
(c) at an infinite number of points (d) none of these
10. 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 modified (d) the change in constraints is ignored
11. Which of the following statements is correct?
- (a) Every LPP admits an optimal solution
(b) A LPP admits unique optimal solution
(c) If a LPP admits two optimal solutions it has an infinite number of optimal solutions
(d) The set of all feasible solutions of a LPP is not a convex set
12. Which of the following is not a convex set?
- (a) $\{(x, y) : 2x + 5y < 7\}$ (b) $\{(x, y) : x^2 + y^2 \leq 4\}$ (c) $\{x : |x| = 5\}$ (d) $\{(x, y) : 3x^2 + 2y^2 \leq 6\}$
13. By graphical method, the solution of linear programming problem
- Maximize $Z = 3x_1 + 5x_2$
Subject to $3x_1 + 2x_2 \leq 18$
 $x_1 \leq 4$
 $x_2 \leq 6$
 $x_1 \geq 0, x_2 \geq 0$, is
- (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) $x_1 = 4, x_2 = 6, Z = 42$
14. The region represented by the inequation system $x, y \geq 0, y \leq 6, x + y \leq 3$ is
- (a) unbounded in first quadrant (b) unbounded in first and second quadrants
(c) bounded in first quadrant (d) none of these
15. The point at which the maximum value of $x + y$, subject to the constraints $x + 2y \leq 70, 2x + y \leq 95, x, y \geq 0$ is obtained, is
- (a) (30, 25) (b) (20, 35) (c) (35, 20) (d) (40, 15)

1.b , 2.b , 3.d , 4.b , 5.d , 6.c , 7.d , 8.c , 9.c , 10.a , 11.c , 12.c , 13.b , 14.a , 15.d

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