RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

CBSE PRACTICE PAPER(2024)

(Mathematics)

Grade : XII **Marks: 40**

marks

Chapter: LPP Set-2 **Time: 90**

minutes

SECTION A

(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)

1. For the constraint of a linear optimizing function $z = x_1 + x_2$, given by $x_1 + x_2 \le 1,\ 3x_1 + x_2 \ge 3$ and $x_1,\ x_2 \ge 0$

(a) There are two feasible regions (b) There are infinite feasible regions (c) There is no feasible region (d) none of these

2. The graph of $x \le 2$ and $y \ge 2$ will be situated in the

(a)First and second quadrant (b) Second and third quadrant (c) First and third quadrant (d)Third and fourth quadrant

3. The solution of set of constraints $x + 2y \ge 11,\ 3x + 4y \le 30,\ \ 2x + 5y \le 30,\ x \ge 0,\ \ y \ge 0$ includes the point

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

4. Which of the following is not a vertex of the positive region bounded by the inequalities $2x + 3y \le 6$, $5x + 3y \le 15$ and $x,\ y \ge 0$

(a) (0, 2) (b) (0, 0) (c) (3, 0) (d) None of these

5. The intermediate solutions of constraints must be checked by substituting them back into

(a)Objective function (b) Constraint equations (c) Not required (d) None of these

6. For the constraints of a L.P. problem given by $x_1 + 2x_2 \le 2000, x_1 + x_2 \le 1500, x_2 \le 600$ and $x_1,\ x_2 \ge 0$, which one of the following points does not lie in the positive bounded region

(a) (1000, 0) (b) (0, 500) (c) (2, 0) (d) (2000, 0)

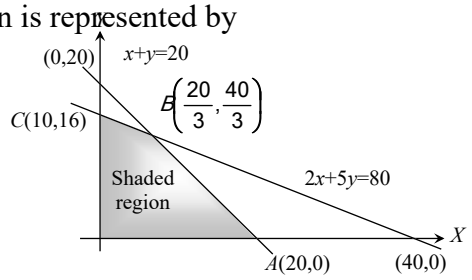
7. A basic solution is called non-degenerate, if

(a) All the basic variables are zero (b) None of the basic variables is zero (c) At least one of the basic variables is zero (d) none of these

8. If the number of available constraints is 3 and the number of parameters to be optimized is 4, then

(a) The objective function can be optimized (b) The constraints are short in number (c) The solution is problem oriented (d)None of these

9. Shaded region is represented by



(a) $2x + 5y \ge 80,$ $x + y \le 20,\ x \ge 0,\ y \le 0$ (b) $2x + 5y \ge 80,\ x + y \ge 20,\ x \ge 0,$ (c) $2x + 5y \le 80,\ x + y \le 20,\ x \ge 0,\ y \ge 0$ (d)None of these

10 The constraints

$-x_1 + x_2 \le 1$

$-x_1 + 3x_2 \le 9$

$x_1, x_2 \ge 0$ define on

(a) Bounded feasible space (b) Unbounded feasible space (c) Both bounded and unbounded feasible space (d) none of these

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each.)

11 For the L.P. problem *Min* $z = x_1 + x_2$ such that $5x_1 + 10x_2 \le 0,\ x_1 + x_2 \ge 1,\ x_2 \le 4$ and $x_1, x_2 \ge 0$

12 On maximizing $z = 4x + 9y$ subject to $x + 5y \le 200,\ 2x + 3y \le 134$ and $x, y \ge 0$

13 For the L.P. problem *Min* $z = 2x + y$ subject to $5x + 10y \le 50,\ x + y \ge 1,\ y \le 4$ and $x, y \ge 0$

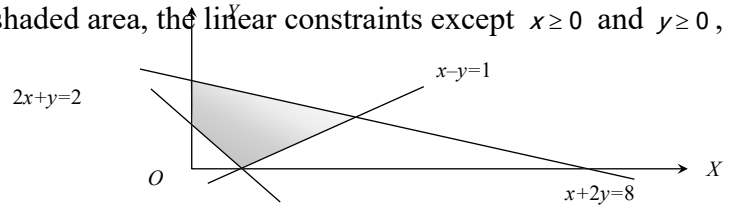
SECTION C

(This section comprises of short answer type questions (SA) of 3 marks each)

14 The maximum value of $z = 4x + 3y$ subject to the constraints $3x + 2y \ge 160, 5x + 2y \ge 200,\ x + 2y \ge 80;\ x, y \ge 0$ is

15 The minimum value of the objective function $z = 2x + 10y$ for linear constraints $x \ge 0, y \ge 0,\ x - y \ge 0,$

16 For the following shaded area, the linear constraints except $x \ge 0$ and $y \ge 0$, are



SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

17 For the L.P. problem *Min* $z = 2x_1 + 3x_2$ such that $-x_1 + 2x_2 \le 4,\ x_1 + x_2 \le 6,\ x_1 + 3x_2 \ge 9$ and $x_1, x_2 \ge 0$.

18 A manufacturer of electronic circuits has a stock of 200 resistors, 120 transistors and 150 capacitors and is required to produce two types of circuits A and B. Type A requires 20 resistors, 10 transistors and 10 capacitors. Type B requires 10 resistors, 20 transistors and 30 capacitors. If the profit on type A circuit is Rs 50 and that on type B circuit is Rs 60, formulate this problem as a LPP so that the manufacturer can maximise his profit.

SECTION E

(This section comprises of 3 case-study/passage-based questions of 4 marks each with two sub-questions. First two case study questions have three sub questions of marks 1, 1, 1,1 respectively. The third case study question has two sub questions of 2 marks each.)

19. A Firm makes pents and shirts. A shirt takes 2 hour on machine and 3 hour of man labour while a pent takes 3 hour on machine and 2 hour of man labour. In a week there are 70 hour machine and 75 hour of man labour available. If the firm determine to make *x* shirts and *y* pents per week, then for this the linear constraints and find maximum minimum.