## L.P.P. ASSIGNMENT (NET)

### JUNE – 2014

### PART – C

**1.** Consider the following primal linear programming problem

max $z = -3x_1 + 2x_2$

subject to $x_1 \le 3,\ x_1 - x_2 \le 0,\ x_1, x_2 \ge 0$

Which of the following statements are true?

1. The primal problem has an optimal solution
2. The primal problem has an unbounded solution
3. The dual problem has an unbounded solution
4. The dual problem has no feasible solution

### DECEMBER - 2014

**2.** Consider the linear programming problem
Minimize z= -2x-5y
subject to 3x+4y≥5, x≥0, y≥0.
Which of the following is correct?

1. Set of feasible solutions is empty
2. Set of feasible solutions is non-empty but there is no optimal solution
3. Optimal value is attained at $\left(0, \frac{5}{4}\right)$
4. Optimal value is attained at $\left(\frac{5}{3}, 0\right)$

### DECEMBER - 2015

**3.** Consider the following Linear Programming Problem. Max $x_1 + \frac{5}{2}x_2$ subject to

$5x_1 + 3x_2 \le 15$

$-x_1 + x_2 \le 1$

$2x_1 + 5x_2 \le 10$

$x_1,\ x_2 \ge 0.$

The problem
1. has no feasible solution.
2. has infinitely many optimal solutions.
3. has a unique optimal solution.
4. has an unbounded solution.

### JUNE – 2016

### PART – C

**4.** Maximise $3x + 4y$ subject to $x \ge 0,\ y \ge 0,\ x \le 3,\ \frac{1}{2}x + y \le 4,\ x + y \le 5$. Which among the following are correct?
1. The optimal value is 19.
2. The optimal value is 18
3. (3, 2) is a extreme point of the feasible region.
4. $\left(3, \frac{3}{2}\right)$ is an extreme point of the feasible region.

### DECEMBER – 2016

### PART – C

**5.** Consider the linear programming problem (LPP) maximize z=3x+5y
Subject to x+5y ≤ 10
2x+2y≤5
x≥0, y≥0. Then
1. The LPP does not admit any feasible solutions.
2. There exists a unique optimal solution to the LPP
3. There exists a unique optimal solution to the dual problem
4. The dual problem has an unbounded solution

### JUNE 2017

**6.** Consider the LPP:
Minimize $c^t x$ subject to $Ax = b, x \ge 0$, where

$A = \begin{bmatrix} 1 & 1 & 3 & 1 & 2 \\ 0 & -1 & -2 & -3 & 1 \end{bmatrix},\ b = \begin{bmatrix} 2 \\ -1 \end{bmatrix},$

$c = (2, -1, 1, -9, 0)^t$, and

$x = (x_1, x_2, x_3, x_4, x_5)^t$.

Using the revised simplex method with current basis as $\begin{bmatrix} 1 & 1 \\ 0 & -1 \end{bmatrix}$, which of the following statements is correct?
1. The next entering variable is $x_5$
2. The solution corresponding to the current basis is optimal



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3. The next entering variable is $x_4$
4. The next entering variable is $x_3$

**7.** Consider the problem:
Maximize $2y_1+3y_2+5y_3+4y_4$
Subject to
$y_1+y_2\le 1, y_2+y_3\le 1, y_3\le 1, y_3+y_4\le 1,$
$y_4+y_1\le 1$ and $y_i\ge 0$ for $i=1,2,3,4.$ Then the optimum value is
1. equal to 8
2. between 8 and 9
3. greater than or equal to 7
4. less than or equal to 7

**8.** Let $(x_1,x_2,x_3,x_4)$ be an optimal solution to the problem of minimizing $x_1+x_2+x_3+x_4$
subject to the constraints
$x_1+x_2 \ge 300$, $x_2+x_3 \ge 500$
$x_3+x_4 \ge 400$, $x_4+x_1 \ge 200$
$x_1 \ge 0, x_2 \ge 0, x_3 \ge 0, x_4 \ge 0$.
Which of the following are not possible values of any $x_i$ ?
1. 300 2. 400
3. 500 4. 600

**JUNE -18**

**Part-B**

**9.** Suppose that |3x| + |2y| ≤ 1. Then the maximum value of 9x + 4y is
1. 1 2. 2
3. 3 4. 4

**JUNE – 19**

**PART- B**

**10.** The maximum value of the objective function z = 5x + 2y under the linear constraints x ≥ 0, y ≥ 0, x ≥ y and 2≤x+y≤4 is
1. 14 2. 20
3. 25 4. 27

**DECEMBER – 2019**

**PART- B**

**11.** Subject to the conditions 0 ≤ x ≤ 10, 0≤y≤ 5, the minimum value of the function 4x – 5y + 10 is
1. 10
2. 0
3. -25
4. -15

**JUNE – 20**

**PART- B**

**12.** Consider the following Linear Programming Problem.
Maximise
4x + 5y
subject to
2x + 3y ≤ 14
x + 2y ≤ 9
x + y ≤ 6
x ≥ 0, y ≥ 0
What is the optimal value of the objective function?
1. 24 2. 26
3. 27 4. 25

**JUNE – 21**

**PART- C**

**13.** Consider the following Linear Programming Problem
Minimise 14x + 9y + 6z subject to
2x + y + z ≥ 8
3x + 2y + z ≥ 10
x ≥ 0, y ≥ 0, x ≥ 0
What is the optimal value of the objective function?
1. 52 2. 48
3. 50 4. 56

**JUNE – 22**

**PART- B**

**14.** Consider the following maximization problem
Maximise: $x_1 + 3x_2$ subject to constraints
$x_1 \ge 0, x_2 \ge 0, x_1 + x_2 \le 6$
$2x_1 + x_2 \le 8$
$x_1 + 2x_2 \le 9$
Which of following is dual problem
1. Minimize $6y_1 + 8y_2 + 9y_3$ subject to $y_1 \ge 0, y_2 \ge 0, y_3 \ge 0, y_1 + 2y_2 + y_3 \ge 1, y_1 + y_2 + 2y_3 \ge 3$
2. Minimize $6y_1 + 8y_2 + 9y_3$ subject to $y_1 \ge 0, y_2 \ge 0, y_3 \ge 0, y_1 + 2y_2 + y_3 \ge 3, y_1 + y_2 + 2y_3 \ge 1$
3. Minimize $6y_1 + 8y_2 + 9y_3$ subject to $y_1 \ge 0, y_2 \ge 0, y_3 \ge 0, y_1 + 2y_2 + y_3 \le 1, y_1 + y_2 + 2y_3 \le 3$
4. Minimize $9y_1 + 8y_2 + 6y_3$ subject to $y_1 \ge 0, y_2 \ge 0, y_3 \ge 0, y_1 + 2y_2 + y_3 \ge 1, y_1 + y_2 + 2y_3 \ge 3$


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**JUNE – 23**

**PART- B**

**15.** Consider the linear programming problem maximize x + 3y, subject to $A\begin{pmatrix} x \\ y \end{pmatrix} \le b$, where $A = \begin{pmatrix} -1 & -1 \\ 0 & 1 \\ -1 & 1 \\ 1 & 2 \\ 0 & -1 \end{pmatrix}$ and $b = \begin{pmatrix} -1 \\ 5 \\ 5 \\ 14 \\ 0 \end{pmatrix}$. Which of the following statements is true?

(1) The objective function attains its maximum at $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$ in the feasible region.

(2) The objective function attains its maximum at $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ in the feasible region.

(3) The objective function attains its maximum at $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$ in the feasible region.

(4) The objective function does not attain its maximum at $\begin{pmatrix} 14 \\ 0 \end{pmatrix}$ in the feasible region.

**JUNE – 23**

**PART- B**

**16.** Consider the linear programming problem:
Maximize z = 3x + 4y
subject to x + y ≤ 12, 2x + 3y ≤ 30, x + 4y ≤ 36, x ≥ 0, y ≥ 0.
Then the optimal solution of the given problem is
(1) x* = 6, y* = 6 (2) x* = 7, y* = 5
(3) x* = 3, y* = 8 (4) x* = 4, y* = 8

**JUNE – 24**

**PART- C**

**17.** Consider the linear programming problem:
max $\{x_1 + x_2 + x_3\}$
subject to constraints
$x_1 + x_2 - x_3 \le 1$,
$x_1 + x_3 \le 2$,
$0 \le x_1 \le \frac{1}{2}$, $x_2 \ge 0$,
and $0 < x_3 \le 1$.
Which of the following statements are true?
(1) The optimum value is 3
(2) The optimum value is $\frac{3}{2}$
(3) (0, 2, 1) is an extreme point of the feasible region
(4) $\left(\frac{1}{2}, 0, 1\right)$ is the optimal solution

**DECEMBER – 2024**

**PART – C**

**18.** Consider maximizing the objective function $P = x_1 + x_2$ subject to
$x_1 + x_2 + 2x_3 \le 5$ $2x_1 - 3x_3 \ge 1$,
$x_2 + x_3 \le 0$,
$x_1 \ge 0, x_2 \ge 0, x_3 \ge 0$. Then which of the following statements are true?
(1) The optimal solution is 4.
(2) An optimal point is (4,1,0).
(3) The optimal solution is 6.
(4) $\left(\frac{1}{2}, 0, 0\right)$ is a corner point.

**JUNE – 2025**

**PART – B**

**19.** Solve the following linear programming problem:
maximize z = x + y
subject to
5x + 3y ≤ 30
2x + 6y ≤ 25
2x – y ≤ 8
x ≥ 0, y ≥ 0.
Then the optimal value of the objective function is
(1) $\frac{45}{11}$ (2) $\frac{74}{11}$
(3) $\frac{85}{12}$ (4) $\frac{25}{6}$

**DECEMBER – 2025**

**PART – B**

**20.** Consider the following linear programming problem:



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Maximize $3x_1 + 4x_2$
Subject to
$3x_1+2x_2 \leq 12$,
$3x_1+5x_2 \leq 15$,
$2x_1- x_2 \geq 0$,
$x_2 \leq 2$,
and $x_1, x_2 \geq 0$.

Which of the following values is the optimum value of the objective function in the feasible region?

1. 11
2. 13
3. 14
4. 15



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**ANSWERS**

| | | |
|---|---|---|
| 1. (2,4) | 2. (3) | 3. (2) |
| 4. (2,3) | 5. (2,3) | 6. (3) |
| 7. (3,4) | 8. (3,4) | 9. |
| 10. (2) | 11. | 12. |
| 13. (1) | 14. (1) | 15. |
| 16. (1) | 17. | 18. (4) |
| 19. (3) | 20. (3) | |



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