

By **O.P. GUPTA**

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$V = \frac{4}{3}\pi r^3$$

MULTIPLE CHOICE TYPE QUESTIONS

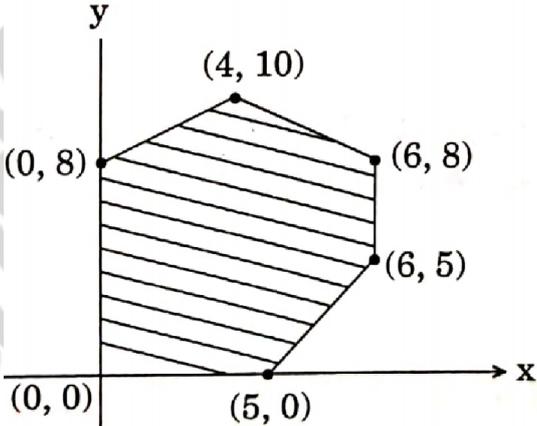
For CBSE 2026 Exams - Mathematics (041) - Class 12

Topics : Linear Programming

Max. Marks : 10

☑ *Select the correct option in the followings. Each question carries 1 mark.*

- Q01. The feasible region for an LPP
 (a) is always a convex polygon (b) is always a concave polygon
 (c) depends on the given constraints (d) depends on objective function
- Q02. The corner points of the feasible region determined by the system of linear constraints are (0, 10), (5, 5), (15, 15), (0, 20). Let $Z = px + qy$, where $p, q > 0$. Condition on p and q so that the maximum of Z occurs at the points (15, 15) and (0, 20) both, is
 (a) $p = q$ (b) $p = 2q$ (c) $q = 2p$ (d) $q = 3p$
- Q03. If the feasible region for a linear programming problem is bounded, then the objective function $Z = ax + by$ has _____ value.
 (a) both, a maximum and a minimum (b) only maximum
 (c) only minimum (d) neither maximum nor minimum
- Q04. The feasible region for an LPP is shown below :

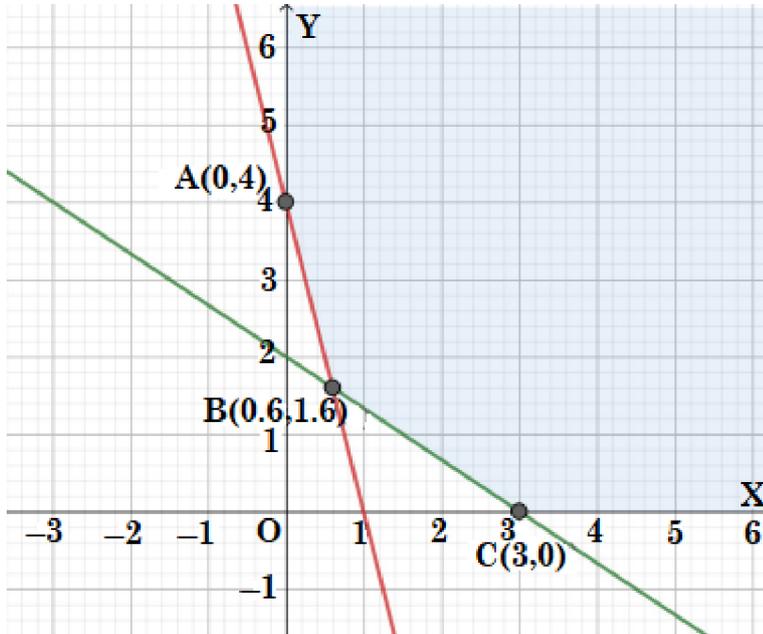


Let $z = 3x - 4y$ be the objective function. Maximum of z occurs at

- (a) (0, 0) (b) (0, 8) (c) (5, 0) (d) (4, 10)
- Q05. The corner points of the feasible region determined by the system of linear constraints are (0, 0), (0, 40), (20, 40), (60, 20), (60, 0). The objective function is $Z = 4x + 3y$. Compare the quantity in Column A and Column B
- | | |
|-----------------|-----------------|
| Column A | Column B |
| Maximum of Z | 325 |
- (a) The quantity in column A is greater
 (b) The quantity in column B is greater
 (c) The two quantities are equal
 (d) The relationship can not be determined on the basis of the information supplied
- Q06. Corner points of the feasible region for an LPP are (0, 2), (3, 0), (6, 0), (6, 8) and (0, 5). Let $F = 4x + 6y$ be the objective function. The Minimum value of F occurs at

- (a) (0, 2) only
- (b) (3, 0) only
- (c) the mid point of the line segment joining the points (0, 2) and (3, 0) only
- (d) any point on the line segment joining the points (0, 2) and (3, 0)

Q07. Feasible region (shaded) for a LPP is shown in the figure. Minimum of $Z = 4x + 3y$ occurs at the point



- (a) (0.6, 1.6) only
- (b) (3, 0) only
- (c) (0.6, 1.6) and (3, 0) only
- (d) every point of the line-segment joining the points (0.6, 1.6) and (3, 0)

Q08. The point which does not lie in the half-plane $2x + 3y - 12 \leq 0$, is

- (a) (1, 2)
- (b) (2, 1)
- (c) (2, 3)
- (d) (-3, 2)

Question numbers 09 and 10 are Assertion and Reason based questions. Two statements are given, one labelled **Assertion (A)** and the other labelled **Reason (R)**. Select the correct answer from the codes (a), (b), (c) and (d) as given below.

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true and Reason (R) is **not** the correct explanation of Assertion (A).
- (c) Assertion (A) is true but Reason (R) is false.
- (d) Assertion (A) is false but Reason (R) is true.

Q09. **Assertion (A)** : Consider the following LPP.

Minimize $f = 6x + 10y$, subject to constraints $x \geq 0, y \geq 0, x \geq 6, y \geq 2, 2x + y \geq 10$.

Then the redundant constraints are $x \geq 6$ and $y \geq 2$.

Reason (R) : A redundant constraint in a linear programming problem (LPP) is a constraint that can be removed from a system of linear constraints without changing the feasible region.

Q10. **Assertion (A)** : Let $Z = 2x + 3y$ be the objective function for a linear programming problem.

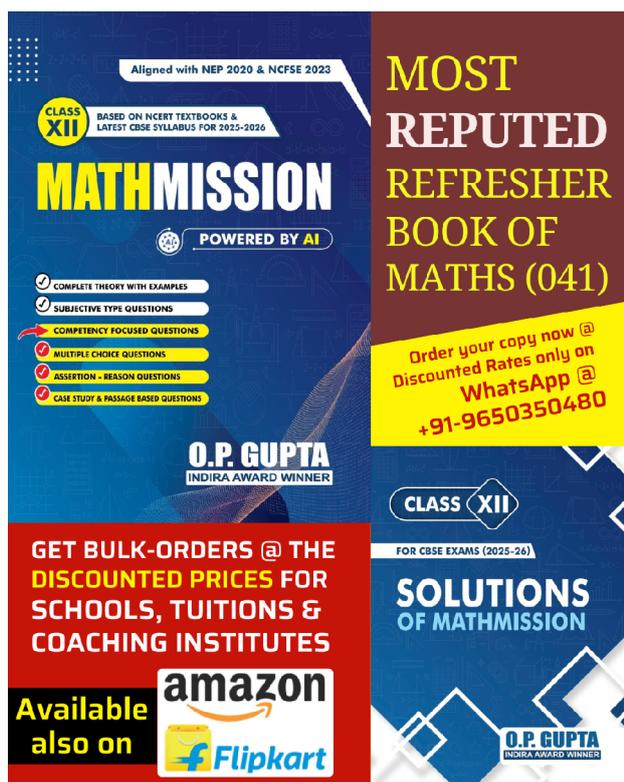
Following table depicts the corner points of feasible region and corresponding value of Z .

Corner points	Value of Z
A (6, 0)	12
B (3, 2)	12
C (0, 2)	6

Value of Z is maximum at $A(6, 0)$ and $B(3, 2)$ only.

Reason (R) : For the objective function $Z = 2x + 3y$ (refer to the **Assertion (A)** statement), the maximum value will occur at infinite number of points.

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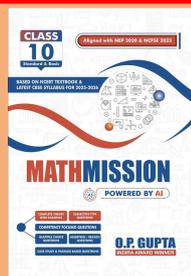
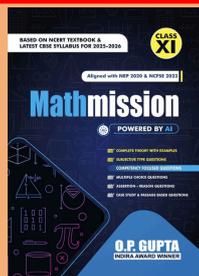
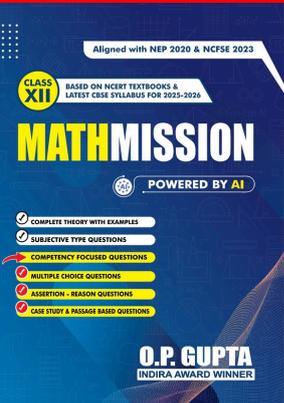
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