CLASS XI – MATHEMATICS (041)
CHAPTER 5 : LINEAR INEQUALITIES
PRACTICE PAPER (SESSION 2026–27)

Maximum Marks: 40 **Time Allowed: 1½ Hours**

General Instructions:

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 23 questions. All questions are compulsory.
2. This question paper is divided into five Sections – A, B, C, D and E.
3. In Section A, Questions 1 to 12 are Multiple Choice Questions (MCQs) and Questions 13 and 14 are Assertion–Reason based questions of 1 mark each.
4. In Section B, Questions 15 to 18 are Very Short Answer (VSA) type questions, carrying 2 marks each.
5. In Section C, Questions 19 to 21 are Short Answer (SA) type questions, carrying 3 marks each.
6. In Section D, Question 22 is a Long Answer (LA) type question, carrying 5 marks.
7. In Section E, Question 23 is a case study based question, carrying 4 marks.
8. There is no overall choice. However, an internal choice has been provided in 2 questions of Section B (Q17, Q18), 2 questions of Section C (Q20, Q21), in Q22 of Section D and in one sub-part of Q23 of Section E.
9. Draw neat and clean figures wherever required. Use of calculators is not allowed. Unless stated otherwise, x is a real number.

SECTION – A **(14 × 1 = 14)**

This section comprises of 12 multiple choice questions (Q1–Q12) and 2 assertion–reason based questions (Q13–Q14) of 1 mark each.

No.	Questions	Marks

Q1. The graph in Fig. 1 shows the solution set of which of the following inequalities? **1**

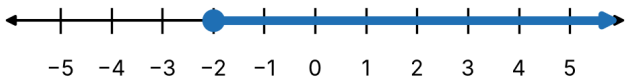


Fig. 1

(A) $3x + 4 \leq -2$ (B) $3x + 4 > -2$

(C) $-3x + 4 \geq -2$ (D) $3x + 4 \geq -2$

Q2. The solution set shown on the number line in Fig. 2 is **1**

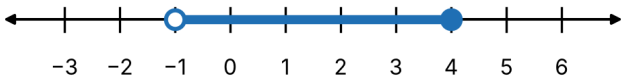


Fig. 2

(A) $[-1, 4)$ (B) $(-1, 4]$

(C) $(-1, 4)$ (D) $[-1, 4]$

Q3. If $4x - 5 < 11$ and x is a natural number, then the solution set is **1**

(A) {1, 2, 3} (B) {1, 2, 3, 4}

(C) {0, 1, 2, 3} (D) {. . . , −1, 0, 1, 2, 3}

Q4. If $-3x \geq 12$, then **1**

(A) $x \geq -4$ (B) $x \geq 4$

(C) $x \leq -4$ (D) $x \leq 4$

Q5. The solution set of the inequality $3x - 7 > 5 + x$, where x is a real number, is **1**

(A) $(-\infty, 6)$ (B) $[6, \infty)$

(C) $(-\infty, -6)$ (D) $(6, \infty)$

Q6. The solution set of the inequality $-7 \leq 2x - 3 < 9$ is **1**

(A) $(-2, 6]$ (B) $(-2, 6)$

(C) $[-2, 6)$ (D) $[-2, 6]$

Q7. The solution set of $(2x - 1)/3 \geq (x + 2)/2 - 1$ is **1**

(A) $[2, \infty)$ (B) $(2, \infty)$

(C) $(-\infty, 2]$ (D) $(-\infty, 2)$

Q8. Fig. 3 shows the solution set of an inequality when x is a natural number. The inequality is **1**

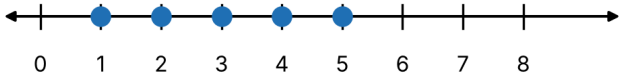


Fig. 3

(A) $3x < 15$ (B) $3x \leq 16$

(C) $3x \leq 12$ (D) $3x \leq 21$

Q9. Neha has ₹200. She spends ₹35 on a pen and wants to buy as many notebooks as possible at ₹18 each with the remaining money. The maximum number of notebooks she can buy is **1**

(A) 9 (B) 10

(C) 8 (D) 11

Q10. The number of integers x satisfying $-3 < 2x + 1 \leq 9$ is **1**

(A) 5 (B) 7

(C) 6 (D) 4

Q11. The number of pairs of consecutive odd natural numbers, both larger than 8, whose sum is less than 36 is **1**

(A) 3 (B) 4

(C) 5 (D) 6

Q12. The solution set of the system of inequalities $x + 5 > 2x - 1$ and $2x + 3 \geq 7$ is **1**

(A) $(2, 6]$ (B) $(2, 6)$

(C) $[2, 6]$ (D) $[2, 6)$

Assertion–Reason Based Questions

Directions: Question numbers 13 and 14 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer from the options (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 but 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.

Q13. **Assertion (A):** The solution of the inequality $-2x < 8$ is $x > -4$. **1**
Reason (R): When both sides of an inequality are multiplied or divided by a negative number, the sign of the inequality is reversed.

Q14. **Assertion (A):** If x is a natural number, the solution set of $3x + 2 \geq 8$ is {2, 3, 4, . . .}. **1**
Reason (R): The solution set of an inequality $ax + b \geq c$, with x real, is always a closed and bounded interval.

SECTION – B (4 × 2 = 8)

This section comprises of 4 very short answer (VSA) type questions of 2 marks each.

Q15. Fig. 4 shows the graphs of two inequalities, (1) and (2), on the number line. The bold part of the lowest line shows the values of x common to both. **2**

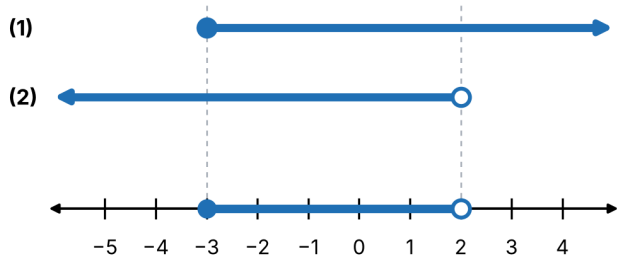


Fig. 4

(i) Write the inequalities (1) and (2) that are graphed. **[1]**
(ii) Write the common solution set in interval notation. **[1]**

Q16. Solve $7x - 3 \leq 4x + 9$, when (i) x is a natural number, (ii) x is a real number. **2**

Q17. **(A)** Solve $(2x + 5)/3 > (x - 1)/2 + 1$. **2**

OR

(B) Solve $5(x - 1) \leq 3(2x + 1)$.

Q18. **(A)** Solve $-9 \leq 3x + 6 < 15$. **2**

OR

(B) A student scored 56 and 68 marks in the first two tests. What is the minimum mark he must score in the third test so that his average is at least 65?

SECTION – C (3 × 3 = 9)

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

Q19. A rectangular garden has length (x + 6) m and breadth x m, as shown in Fig. 5. The length of fencing available is at most 60 m, and the whole perimeter of the garden is to be fenced. **3**

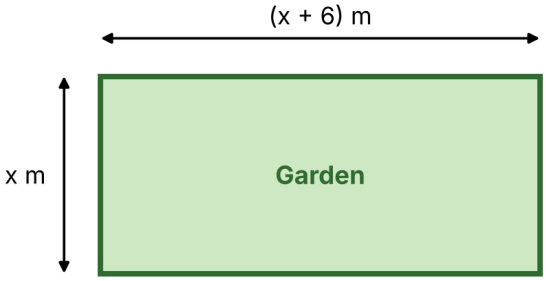


Fig. 5

(i) Write the perimeter of the garden in terms of x. **[1]**

(ii) Form an inequality in x and solve it. **[1]**

(iii) Find the greatest possible breadth and the corresponding length of the garden. **[1]**

Q20. **(A)** Solve $(x - 1)/3 + (x + 2)/2 \leq 4$ and write the solution set in interval notation. **3**

OR

(B) Solve $1 \leq (5 - 2x)/3 \leq 3$.

Q21. **(A)** Solve the system of inequalities $2x + 5 \geq 1$ and $3x - 7 < 8$, and represent the solution on the number line. **3**

OR

(B) A manufacturer sells each toy for ₹40. The cost of producing x toys is ₹(20x + 3000). How many toys must be produced and sold so that the manufacturer makes a profit?

SECTION – D (1 × 5 = 5)

This section comprises of 1 long answer (LA) type question of 5 marks.

Q22. **(A)** A chemist has 300 litres of a 10% acid solution. How many litres of a 40% acid solution must be added to it so that the acid content in the resulting mixture is more than 20% but less than 25%? **5**

OR

(B) A man cuts three pieces from a single wire of length 100 cm. The second piece is 5 cm longer than the shortest piece, and the third piece is three times as long as the shortest piece. If the third piece is to be at least 10 cm longer than the second piece, find the possible lengths of the shortest piece.

SECTION – E **(1 × 4 = 4)**

This section comprises of 1 case study based question of 4 marks with sub-parts (i), (ii), (iii) of marks 1, 1, 2 respectively.

Q23. **Case Study:** A vaccine must be stored in a refrigerator at a temperature C (in °C) between 2°C and 8°C, both included. Fig. 6 shows a thermometer with both Celsius and Fahrenheit scales and the safe zone shaded. The two scales are related by F = (9/5)C + 32. **4**

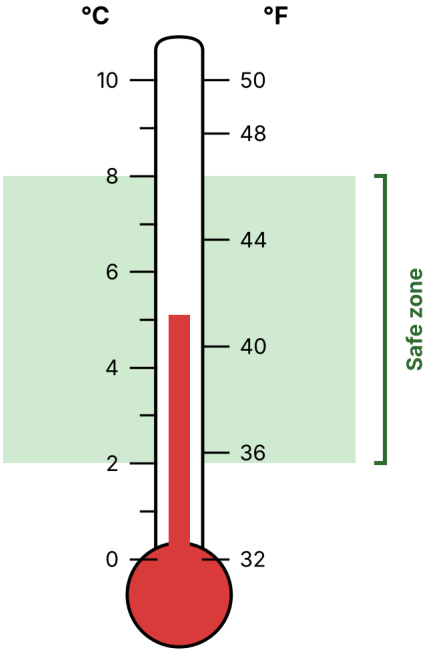


Fig. 6

Based on the given information, answer the following questions:

(i) Write the safe storage condition as an inequality in C. **[1]**

(ii) Express the safe range in degrees Fahrenheit. **[1]**

(iii) **(a)** Another medicine must be stored between 59°F and 68°F. Find the range of its storage temperature in °C. **[2]**

OR

(b) The temperature of the refrigerator (in °C) when its dial is set at x is (3x − 4)/2. Find the values of x for which the vaccine stays in the safe zone. **[2]**

— End of Question Paper —