

# MATH LOVE INSTITUTE

Annual Examination 2025-26

Class: VII | Subject: Mathematics (Paper - 2)

Time: 3 Hours | Maximum Marks: 80

Math Love Institute | Raipur, CG | Indore, MP | [www.mathlove.in](http://www.mathlove.in) | +91 7869553517

<b>Student Name:</b>	_____
<b>Roll Number:</b>	_____
<b>Date:</b>	_____

## General Instructions:

1. All questions are compulsory.
2. The question paper is divided into 5 sections: A, B, C, D, and E.
3. Section A: Multiple Choice Questions (1 mark each) - 15 marks
4. Section B: Fill in the Blanks / True-False (1 mark each) - 15 marks
5. Section C: Short Answer Questions (2 marks each) - 20 marks
6. Section D: Long Answer Questions (3 marks each) - 15 marks
7. Section E: Case Study Based Questions (5 marks each) - 15 marks
8. There is no negative marking.
9. Use of calculators is not allowed.
10. Show all necessary working clearly.

Based on NCERT Syllabus 2025-26 | Chapters: Rational Numbers | Data Handling | Comparing Quantities | Perimeter and Area | Exponents and Powers | Algebraic Expressions | Visualising Solid Shapes

**SECTION A - MULTIPLE CHOICE QUESTIONS (15 × 1 = 15 marks)**

**Q1.** The standard form of  $-15/35$  is: **[1 mark]**

- (a)  $-3/7$
- (b)  $3/7$
- (c)  $-15/35$
- (d)  $15/-35$

**Q2.** Between any two rational numbers, there are: **[1 mark]**

- (a) Exactly 10 rational numbers
- (b) Exactly 100 rational numbers
- (c) Infinitely many rational numbers
- (d) No rational numbers

**Q3.** The mode of the data: 3, 5, 7, 5, 9, 5, 8 is: **[1 mark]**

- (a) 3
- (b) 5
- (c) 7
- (d) 9

**Q4.** The median of first 7 natural numbers is: **[1 mark]**

- (a) 3
- (b) 4
- (c) 7
- (d) 28

**Q5.** If the ratio of two numbers is 5:8 and their sum is 65, then the smaller number is: **[1 mark]**

- (a) 25
- (b) 30
- (c) 35
- (d) 40

- Q6.** Converting 0.375 to a percentage gives: [1 mark]
- (a) 3.75%
  - (b) 37.5%
  - (c) 375%
  - (d) 0.375%
- Q7.** A circle has diameter 14 cm. Its circumference is: (Take  $\pi = 22/7$ ) [1 mark]
- (a) 22 cm
  - (b) 44 cm
  - (c) 88 cm
  - (d) 154 cm
- Q8.** The area of a parallelogram with base 12 cm and height 7 cm is: [1 mark]
- (a) 19 cm<sup>2</sup>
  - (b) 42 cm<sup>2</sup>
  - (c) 84 cm<sup>2</sup>
  - (d) 168 cm<sup>2</sup>
- Q9.** The value of  $(-3)^4$  is: [1 mark]
- (a) -81
  - (b) 81
  - (c) -12
  - (d) 12
- Q10.** Simplifying:  $7^5 \div 7^3$  gives: [1 mark]
- (a)  $7^2$
  - (b)  $7^8$
  - (c)  $7^{15}$
  - (d) 1
- Q11.** The number 5,20,00,000 in standard form is: [1 mark]
- (a)  $5.2 \times 10^6$
  - (b)  $52 \times 10^6$
  - (c)  $5.2 \times 10^7$
  - (d)  $0.52 \times 10^8$

- Q12.** Like terms in the expression  $3x^2 + 5x - 2x^2 + 7$  are: [1 mark]
- (a)  $3x^2$  and  $5x$
  - (b)  $3x^2$  and  $-2x^2$
  - (c)  $5x$  and  $7$
  - (d)  $-2x^2$  and  $7$

- Q13.** The value of  $x$  in the expression  $5x - 3$  when  $x = 2$  is: [1 mark]
- (a) 7
  - (b) 10
  - (c) 13
  - (d) -1

- Q14.** A cylinder has: [1 mark]
- (a) 1 curved surface and 2 flat faces
  - (b) 2 curved surfaces and 1 flat face
  - (c) 3 curved surfaces
  - (d) 6 flat faces

- Q15.** Which of the following represents a net of a cube? [1 mark]
- (a) 6 squares arranged in a cross pattern
  - (b) 4 triangles
  - (c) 3 rectangles
  - (d) 5 circles

**SECTION B - FILL IN THE BLANKS / TRUE-FALSE (15 × 1 = 15 marks)**

**Part I: Fill in the Blanks (10 questions)**

- Q16.** The product of a rational number and its reciprocal is \_\_\_\_\_. [1 mark]
- Q17.** The additive inverse of  $-5/7$  is \_\_\_\_\_. [1 mark]
- Q18.** The range of the data 8, 12, 5, 18, 10 is \_\_\_\_\_. [1 mark]

**Q19.** If an article is sold at a loss of 10%, then  $SP = CP - \underline{\hspace{2cm}}$  % of CP. [1 mark]

**Q20.** Simple Interest =  $(P \times R \times T) / \underline{\hspace{2cm}}$ . [1 mark]

**Q21.** 1 hectare =  $\underline{\hspace{2cm}}$  m<sup>2</sup>. [1 mark]

**Q22.** The area of a rhombus =  $1/2 \times \underline{\hspace{2cm}} \times d_2$ , where  $d_1$  and  $d_2$  are diagonals. [1 mark]

**Q23.** In exponential form,  $1/8$  can be written as 2 raised to the power  $\underline{\hspace{2cm}}$ . [1 mark]

**Q24.** The degree of the term  $5x^3y^2$  is  $\underline{\hspace{2cm}}$ . [1 mark]

**Q25.** A cone has  $\underline{\hspace{2cm}}$  vertex/vertices. [1 mark]

**Part II: True or False (5 questions)**

**Q26.** Zero is a rational number. (True/False) [1 mark]

**Q27.** Mean is always one of the numbers in the given data. (True/False) [1 mark]

**Q28.** If  $SP > CP$ , there is a profit. (True/False) [1 mark]

**Q29.** The area of a circle is  $\pi d$ , where  $d$  is the diameter. (True/False) [1 mark]

**Q30.**  $5x + 3y$  is a binomial expression. (True/False) [1 mark]

**SECTION C - SHORT ANSWER QUESTIONS (10 × 2 = 20 marks)**

**Q31.** Write the following rational numbers in ascending order:  $-2/3, 5/6, -1/2, 1/3$  [2 marks]

**Q32.** Subtract:  $-5/9 - 2/3$  [2 marks]

**Q33.** Find the median of the following data: 12, 8, 15, 20, 10, 18, 14 [2 marks]

**Q34.** Express the ratio 3:5 as a percentage. **[2 marks]**

**Q35.** A shopkeeper buys an article for ₹250 and sells it for ₹300. Find the profit percentage. **[2 marks]**

**Q36.** Find the diameter of a circle whose circumference is 44 cm. (Take  $\pi = \frac{22}{7}$ ) **[2 marks]**

**Q37.** The area of a trapezium is  $180 \text{ cm}^2$ . If the parallel sides are 15 cm and 21 cm, find the height. **[2 marks]**

**Q38.** Express 256 as a power of 2. **[2 marks]**

**Q39.** Evaluate:  $2^6 \times 2^3 \div 2^4$  **[2 marks]**

**Q40.** Subtract:  $(8a - 5b + 3c) - (3a + 2b - 4c)$  **[2 marks]**

<b>SECTION D - LONG ANSWER QUESTIONS (5 × 3 = 15 marks)</b>
---

**Q41.** Find the value of:  $(-2/5) \times (3/7) \times (-5/6)$  **[3 marks]**

**Q42.** The following data shows the number of books read by 10 students in a month: **[3 marks]**

5, 3, 8, 6, 5, 7, 5, 9, 4, 6

Find: (i) Mean (ii) Mode (iii) Median

**Q43.** Arun borrowed ₹12,000 from a bank at 8% per annum simple interest. Find: **[3 marks]**

(i) The interest for 2 years

(ii) The total amount to be paid after 2 years

**Q44.** A rectangular park is 45 m long and 30 m wide. Two crossroads, each 2 m wide, run at right angles through the center of the park, parallel to its sides. **[3 marks]**

Find the area of the roads.

**Q45.** Simplify and express the answer in exponential form:

**[3 marks]**

$$[(3^2)^3 \times 3^4] \div 3^7$$

**SECTION E - CASE STUDY BASED QUESTIONS (3 × 5 = 15 marks)**

**Q46. Case Study 1: School Sports Day**

**[5 marks]**

A school organized a sports day. The following table shows the number of students who participated in different events:

Event	Number of Students
Running	45
Long Jump	30
High Jump	25
Shot Put	20

Based on the above information, answer the following:

- (i) Find the total number of students who participated. (1 mark)
- (ii) What percentage of students participated in Running? (2 marks)
- (iii) Find the ratio of students in Long Jump to High Jump. (1 mark)
- (iv) If 60% of students in Running were girls, how many girls participated in Running? (1 mark)

**Q47. Case Study 2: Garden Design****[5 marks]**

A gardener wants to design a circular flower bed with a radius of 7 meters, surrounded by a rectangular path of uniform width 3 meters on all sides. (Take  $\pi = 22/7$ )

Based on this information, answer the following:

- (i) Find the area of the circular flower bed. (2 marks)
- (ii) Find the dimensions of the outer rectangle. (1 mark)
- (iii) Find the area of the rectangular region including the path. (1 mark)
- (iv) Find the area of the path only. (1 mark)

**Q48. Case Study 3: Mobile Phone Store****[5 marks]**

A mobile phone store offers the following discounts during a sale:

- Phone A: Marked Price ₹20,000, Discount 15%
- Phone B: Marked Price ₹18,000, Discount 10%

Additionally, if a customer pays the full amount in cash, an extra 5% discount is given on the discounted price.

Based on this information, answer the following:

- (i) Find the selling price of Phone A after the first discount. (1 mark)
  - (ii) If a customer buys Phone A with cash payment, what is the final price? (2 marks)
  - (iii) Find the selling price of Phone B after 10% discount. (1 mark)
  - (iv) Which phone is cheaper after both discounts if paid in cash? (1 mark)
-

## DETAILED SOLUTIONS

MATH LOVE INSTITUTE

© 2025 -

CONFIDENTIAL

## SECTION A - MULTIPLE CHOICE QUESTIONS - ANSWERS

**Q1. Answer: (a)  $-\frac{3}{7}$**

**Explanation:** To find standard form, divide numerator and denominator by their HCF.

HCF of 15 and 35 = 5

$$-\frac{15}{35} = \frac{-15 \div 5}{35 \div 5} = -\frac{3}{7}$$

*Marking: 1 mark for correct answer*

**Q2. Answer: (c) Infinitely many rational numbers**

**Explanation:** Between any two rational numbers, there exist infinitely many rational numbers. This is a fundamental property of rational numbers.

*Marking: 1 mark for correct answer*

**Q3. Answer: (b) 5**

**Explanation:** Mode is the value that appears most frequently in the data. In the data 3, 5, 7, 5, 9, 5, 8, the number 5 appears 3 times (most frequent).

*Marking: 1 mark for correct answer*

**Q4. Answer: (b) 4**

**Explanation:** First 7 natural numbers: 1, 2, 3, 4, 5, 6, 7

Median is the middle value = 4th term = 4

*Marking: 1 mark for correct answer*

**Q5. Answer: (a) 25**

**Explanation:** Let the numbers be  $5x$  and  $8x$

$$5x + 8x = 65$$

$$13x = 65$$

$$x = 5$$

$$\text{Smaller number} = 5x = 5 \times 5 = 25$$

*Marking: 1 mark for correct answer*

**Q6. Answer: (b) 37.5%**

**Explanation:**  $0.375 = 0.375 \times 100\% = 37.5\%$

*Marking: 1 mark for correct answer*

**Q7. Answer: (b) 44 cm**

**Explanation:** Circumference =  $\pi d$

$$= \frac{22}{7} \times 14$$

$$= 22 \times 2$$

$$= 44 \text{ cm}$$

*Marking: 1 mark for correct answer*

**Q8. Answer: (c) 84 cm<sup>2</sup>**

**Explanation:** Area of parallelogram = base  $\times$  height

$$= 12 \times 7$$

$$= 84 \text{ cm}^2$$

*Marking: 1 mark for correct answer*

**Q9. Answer: (b) 81**

**Explanation:**  $(-3)^4 = (-3) \times (-3) \times (-3) \times (-3) = 81$

(Negative number raised to even power gives positive result)

*Marking: 1 mark for correct answer*

**Q10. Answer: (a)  $7^2$**

**Explanation:** Using law:  $a^m \div a^n = a^{m-n}$

$$7^5 \div 7^3 = 7^{5-3} = 7^2$$

*Marking: 1 mark for correct answer*

**Q11. Answer: (c)  $5.2 \times 10^7$**

**Explanation:**  $5,20,00,000 = 52000000$

$$= 5.2 \times 10,000,000$$

$$= 5.2 \times 10^7$$

*Marking: 1 mark for correct answer*

**Q12. Answer: (b)  $3x^2$  and  $-2x^2$**

**Explanation:** Like terms have the same variable part.  $3x^2$  and  $-2x^2$  both have  $x^2$  as the variable part.

Marking: 1 mark for correct answer

**Q13. Answer: (a) 7**

**Explanation:**  $5x - 3$  when  $x = 2$   
 $= 5(2) - 3$   
 $= 10 - 3$   
 $= 7$

Marking: 1 mark for correct answer

**Q14. Answer: (a) 1 curved surface and 2 flat faces**

**Explanation:** A cylinder has one curved surface and two flat circular faces (top and bottom).

Marking: 1 mark for correct answer

**Q15. Answer: (a) 6 squares arranged in a cross pattern**

**Explanation:** A cube has 6 square faces. A common net shows these arranged in a cross or T-pattern.

Marking: 1 mark for correct answer

## SECTION B - FILL IN THE BLANKS / TRUE-FALSE - ANSWERS

**Q16. Answer: 1**

**Explanation:** A number multiplied by its reciprocal always equals 1. For example,  $\frac{3}{4} \times \frac{4}{3} = 1$

*Marking: 1 mark for correct answer*

**Q17. Answer: 5/7**

**Explanation:** The additive inverse is the number that when added gives 0. Additive inverse of  $-\frac{5}{7}$  is  $\frac{5}{7}$  because  $(-\frac{5}{7}) + (\frac{5}{7}) = 0$

*Marking: 1 mark for correct answer*

**Q18. Answer: 13**

**Explanation:** Range = Highest value - Lowest value  
= 18 - 5  
= 13

*Marking: 1 mark for correct answer*

**Q19. Answer: 10**

**Explanation:** Loss% = 10%, so SP = CP - 10% of CP

*Marking: 1 mark for correct answer*

**Q20. Answer: 100**

**Explanation:** Simple Interest =  $(P \times R \times T) / 100$ , where P = Principal, R = Rate,  
T = Time

*Marking: 1 mark for correct answer*

**Q21. Answer: 10,000**

**Explanation:** 1 hectare = 10,000 m<sup>2</sup>

*Marking: 1 mark for correct answer*

**Q22. Answer: d<sub>1</sub>**

**Explanation:** Area of rhombus =  $1/2 \times d_1 \times d_2$ , where d<sub>1</sub> and d<sub>2</sub> are the diagonals

*Marking: 1 mark for correct answer*

**Q23. Answer: -3**

**Explanation:**  $1/8 = 1/2^3 = 2^{-3}$

*Marking: 1 mark for correct answer*

**Q24. Answer: 5**

**Explanation:** Degree = Sum of powers of all variables = 3 + 2 = 5

*Marking: 1 mark for correct answer*

**Q25. Answer: 1**

**Explanation:** A cone has 1 vertex (apex point at the top)

*Marking: 1 mark for correct answer*

**Q26. Answer: True**

**Explanation:** Zero can be written as  $0/1$ , which is in the form  $p/q$ . Hence, zero is a rational number.

*Marking: 1 mark for correct answer*

**Q27. Answer: False**

**Explanation:** Mean may or may not be one of the numbers in the data. For example, mean of 3, 4, 8 is 5, which is not in the data.

*Marking: 1 mark for correct answer*

**Q28. Answer: True**

**Explanation:** When Selling Price is greater than Cost Price, there is profit.

*Marking: 1 mark for correct answer*

**Q29. Answer: False**

**Explanation:** The correct formula for area of circle is  $\pi r^2$  or  $\pi(d/2)^2$ . The formula  $\pi d$  gives the circumference, not area.

*Marking: 1 mark for correct answer*

**Q30. Answer: True**

**Explanation:**  $5x + 3y$  has two unlike terms, so it is a binomial expression.

*Marking: 1 mark for correct answer*

## SECTION C - SHORT ANSWER QUESTIONS - ANSWERS

### Q31. Answer: Arranging in ascending order

#### Solution:

Given rational numbers:  $-2/3$ ,  $5/6$ ,  $-1/2$ ,  $1/3$

Step 1: Find LCM of denominators  $(3, 6, 2, 3) = 6$

Step 2: Convert all to denominator 6:

$$-2/3 = -4/6$$

$$5/6 = 5/6$$

$$-1/2 = -3/6$$

$$1/3 = 2/6$$

Step 3: Arrange:  $-4/6$ ,  $-3/6$ ,  $2/6$ ,  $5/6$

**Answer:  $-2/3$ ,  $-1/2$ ,  $1/3$ ,  $5/6$**

*Marking: 1 mark for converting to common denominator, 1 mark for correct order*

### Q32. Answer: Subtraction of rational numbers

#### Solution:

$$-5/9 - 2/3$$

$$= -5/9 - 6/9 \text{ (LCM of 9 and 3 = 9)}$$

$$= (-5 - 6)/9$$

$$= -11/9$$

**Answer: -11/9**

*Marking: 1 mark for LCM and conversion, 1 mark for correct subtraction*

### **Q33. Answer: Finding median**

**Solution:**

Given data: 12, 8, 15, 20, 10, 18, 14

Step 1: Arrange in ascending order: 8, 10, 12, 14, 15, 18, 20

Step 2: Number of observations = 7 (odd)

Median = Middle value = 4th term = 14

**Answer: Median = 14**

*Marking: 1 mark for arranging in order, 1 mark for correct median*

### **Q34. Answer: Converting ratio to percentage**

**Solution:**

$$\text{Ratio} = 3:5 = 3/5$$

$$\text{Percentage} = (3/5) \times 100$$

$$= 0.6 \times 100$$

$$= 60\%$$

**Answer: 60%**

Marking: 1 mark for conversion method, 1 mark for correct percentage

**Q35. Answer: Profit percentage**

**Solution:**

$$CP = ₹250, SP = ₹300$$

$$\text{Profit} = SP - CP = 300 - 250 = ₹50$$

$$\text{Profit}\% = (\text{Profit}/CP) \times 100$$

$$= (50/250) \times 100$$

$$= 20\%$$

**Answer: 20%**

Marking: 1 mark for profit, 1 mark for profit percentage

**Q36. Answer: Finding diameter from circumference**

**Solution:**

$$\text{Circumference} = 44 \text{ cm}$$

$$\pi d = 44$$

$$22/7 \times d = 44$$

$$d = 44 \times 7/22$$

$$d = 2 \times 7$$

$$d = 14 \text{ cm}$$

**Answer: Diameter = 14 cm**

Marking: 1 mark for formula, 1 mark for correct diameter

### Q37. Answer: Height of trapezium

#### Solution:

Area of trapezium =  $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

$$180 = \frac{1}{2} \times (15 + 21) \times h$$

$$180 = \frac{1}{2} \times 36 \times h$$

$$180 = 18h$$

$$h = 180/18$$

$$h = 10 \text{ cm}$$

**Answer: Height = 10 cm**

Marking: 1 mark for formula, 1 mark for correct height

### Q38. Answer: Express 256 as power of 2

#### Solution:

$$256 = 2 \times 128$$

$$= 2 \times 2 \times 64$$

$$= 2 \times 2 \times 2 \times 32$$

$$= 2 \times 2 \times 2 \times 2 \times 16$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 8$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 4$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$= 2^8$$

**Answer:  $256 = 2^8$**

*Marking: 1 mark for factorization, 1 mark for correct exponential form*

### **Q39. Answer: Evaluating exponential expression**

**Solution:**

$$2^6 \times 2^3 \div 2^4$$

$$= 2^{6+3} \div 2^4 \text{ (using } a^m \times a^n = a^{m+n}\text{)}$$

$$= 2^9 \div 2^4$$

$$= 2^{9-4} \text{ (using } a^m \div a^n = a^{m-n}\text{)}$$

$$= 2^5$$

$$= 32$$

**Answer:  $2^5$  or 32**

*Marking: 1 mark for applying laws, 1 mark for correct answer*

### **Q40. Answer: Subtraction of algebraic expressions**

**Solution:**

$$(8a - 5b + 3c) - (3a + 2b - 4c)$$

$$= 8a - 5b + 3c - 3a - 2b + 4c$$

$$= 8a - 3a - 5b - 2b + 3c + 4c$$

$$= 5a - 7b + 7c$$

**Answer:  $5a - 7b + 7c$**

*Marking: 1 mark for opening brackets correctly, 1 mark for combining like terms*

MATH LOVE INSTITUTE

© 2025 -

CONFIDENTIAL

## SECTION D - LONG ANSWER QUESTIONS - ANSWERS

### Q41. Answer: Multiplication of rational numbers

**Solution:**

$$(-2/5) \times (3/7) \times (-5/6)$$

Step 1: Multiply numerators and denominators

$$= [(-2) \times 3 \times (-5)] / [5 \times 7 \times 6]$$

$$= 30 / 210$$

Step 2: Simplify (HCF of 30 and 210 = 30)

$$= (30 \div 30) / (210 \div 30)$$

$$= 1/7$$

**Answer: 1/7**

*Marking: 1 mark for multiplication, 1 mark for simplification, 1 mark for final answer*

### Q42. Answer: Mean, Mode, and Median

**Given data:** 5, 3, 8, 6, 5, 7, 5, 9, 4, 6

**(i) Mean:**

$$\text{Sum} = 5 + 3 + 8 + 6 + 5 + 7 + 5 + 9 + 4 + 6 = 58$$

Number of students = 10

$$\text{Mean} = 58/10 = 5.8$$

**(ii) Mode:**

Arranging: 3, 4, 5, 5, 5, 6, 6, 7, 8, 9

5 appears 3 times (most frequent)

$$\text{Mode} = 5$$

**(iii) Median:**

Arranged data: 3, 4, 5, 5, 5, 6, 6, 7, 8, 9

Number of observations = 10 (even)

Median = Average of 5th and 6th terms

$$= (5 + 6)/2 = 11/2 = 5.5$$

**Answers: (i) Mean = 5.8 (ii) Mode = 5 (iii) Median = 5.5**

*Marking: 1 mark each for mean, mode, and median (3 marks total)*



#### **Q43. Answer: Simple Interest calculation**

**Given:**

Principal (P) = ₹12,000

Rate (R) = 8% per annum

Time (T) = 2 years

**(i) Interest for 2 years:**

$$\text{SI} = (P \times R \times T) / 100$$

$$= (12000 \times 8 \times 2) / 100$$

$$= 192000 / 100$$

$$= ₹1,920$$

**(ii) Total amount after 2 years:**

$$\text{Amount} = \text{Principal} + \text{Interest}$$

$$= 12000 + 1920$$

$$= ₹13,920$$

**Answers: (i) Interest = ₹1,920 (ii) Total Amount = ₹13,920**

*Marking: 1.5 marks for interest, 1.5 marks for total amount (3 marks total)*

**Q44. Answer: Area of crossroads in a park**

**Given:**

$$\text{Length of park} = 45 \text{ m}$$

$$\text{Width of park} = 30 \text{ m}$$

$$\text{Width of each road} = 2 \text{ m}$$

**Solution:**

There are two roads crossing at right angles through the center.

$$\text{Area of horizontal road} = \text{length} \times \text{width}$$

$$= 45 \times 2 = 90 \text{ m}^2$$

$$\text{Area of vertical road} = \text{length} \times \text{width}$$

$$= 30 \times 2 = 60 \text{ m}^2$$

$$\text{Area of overlap (common part)} = 2 \times 2 = 4 \text{ m}^2$$

$$\text{Total area of roads} = 90 + 60 - 4$$

$$= 146 \text{ m}^2$$

**Answer: Area of roads = 146 m<sup>2</sup>**

*Marking: 1 mark for each road area, 1 mark for subtracting overlap (3 marks total)*

**Q45. Answer: Simplifying exponential expression**

**Solution:**

$$[(3^2)^3 \times 3^4] \div 3^7$$

Step 1: Apply  $(a^m)^n = a^{m \times n}$

$$= [3^6 \times 3^4] \div 3^7$$

Step 2: Apply  $a^m \times a^n = a^{m+n}$

$$= 3^{10} \div 3^7$$

Step 3: Apply  $a^m \div a^n = a^{m-n}$

$$= 3^{10-7}$$

$$= 3^3$$

$$= 27$$

**Answer: 3<sup>3</sup> or 27**

*Marking: 1 mark for each law applied correctly (3 marks total)*

M.

© 2025 -  
CONFIDENTIAL

## SECTION E - CASE STUDY BASED QUESTIONS - ANSWERS

### Q46. Answer: School Sports Day Case Study

**(i) Total number of students:**

$$= 45 + 30 + 25 + 20$$

$$= 120 \text{ students}$$

**(ii) Percentage in Running:**

$$\text{Percentage} = (45/120) \times 100$$

$$= (3/8) \times 100$$

$$= 37.5\%$$

**(iii) Ratio of Long Jump to High Jump:**

$$= 30:25$$

$$= 6:5 \text{ (dividing by HCF 5)}$$

**(iv) Girls in Running:**

$$60\% \text{ of } 45 = (60/100) \times 45$$

$$= 27 \text{ girls}$$

**Answers: (i) 120 students (ii) 37.5% (iii) 6:5 (iv) 27 girls**

*Marking: 1 + 2 + 1 + 1 = 5 marks*

#### Q47. Answer: Garden Design Case Study

**Given:** Radius of circular bed = 7 m, Path width = 3 m

**(i) Area of circular flower bed:**

$$\begin{aligned}\text{Area} &= \pi r^2 \\ &= \frac{22}{7} \times 7 \times 7 \\ &= 22 \times 7 \\ &= 154 \text{ m}^2\end{aligned}$$

**(ii) Dimensions of outer rectangle:**

The rectangle must accommodate the circle plus path on all sides

Diameter of circle = 14 m

Length = 14 + 3 + 3 = 20 m

Breadth = 14 + 3 + 3 = 20 m

(It becomes a square of side 20 m)

**(iii) Area of rectangular region:**

$$\text{Area} = 20 \times 20 = 400 \text{ m}^2$$

**(iv) Area of path only:**

$$\begin{aligned}&= \text{Area of rectangle} - \text{Area of circle} \\ &= 400 - 154 \\ &= 246 \text{ m}^2\end{aligned}$$

**Answers: (i) 154 m<sup>2</sup> (ii) 20 m × 20 m (iii) 400 m<sup>2</sup> (iv) 246 m<sup>2</sup>**

*Marking: 2 + 1 + 1 + 1 = 5 marks*

**Q48. Answer: Mobile Phone Store Case Study**

**(i) Selling price of Phone A after first discount:**

Marked Price = ₹20,000

Discount = 15%

Discount amount = 15% of 20,000 =  $(15/100) \times 20,000 = ₹3,000$

SP after first discount = 20,000 - 3,000 = ₹17,000

**(ii) Final price of Phone A with cash payment:**

Additional discount = 5% of 17,000

=  $(5/100) \times 17,000$

= ₹850

Final price = 17,000 - 850 = ₹16,150

**(iii) Selling price of Phone B after 10% discount:**

Marked Price = ₹18,000

Discount = 10% of 18,000 =  $(10/100) \times 18,000 = ₹1,800$

SP = 18,000 - 1,800 = ₹16,200

**(iv) Which phone is cheaper with both discounts?**

Phone B with cash: 5% of 16,200 = ₹810

Final price of Phone B = 16,200 - 810 = ₹15,390

Phone A final price = ₹16,150

Phone B final price = ₹15,390

**Phone B is cheaper**

**Answers: (i) ₹17,000 (ii) ₹16,150 (iii) ₹16,200 (iv) Phone B**

*Marking: 1 + 2 + 1 + 1 = 5 marks*

## Marking Summary

Section	Question Type	Total Marks
Section A	Multiple Choice Questions (15 × 1)	15 marks
Section B	Fill in the Blanks / True-False (15 × 1)	15 marks
Section C	Short Answer Questions (10 × 2)	20 marks
Section D	Long Answer Questions (5 × 3)	15 marks
Section E	Case Study Based Questions (3 × 5)	15 marks
<b>TOTAL</b>		<b>80 marks</b>

### Chapter-wise Question Distribution:

- **Ch 8: Rational Numbers** - 17 marks (Q1, Q2, Q16, Q17, Q26, Q31, Q32, Q41)
- **Ch 3: Data Handling** - 11 marks (Q3, Q4, Q18, Q27, Q33, Q42)
- **Ch 7: Comparing Quantities** - 19 marks (Q5, Q6, Q19, Q20, Q28, Q34, Q35, Q43, Q46, Q48)

- **Ch 9: Perimeter and Area** - 15 marks (Q7, Q8, Q21, Q22, Q29, Q36, Q37, Q44, Q47)
- **Ch 11: Exponents and Powers** - 11 marks (Q9, Q10, Q11, Q23, Q38, Q39, Q45)
- **Ch 10: Algebraic Expressions** - 5 marks (Q12, Q13, Q24, Q30, Q40)
- **Ch 13: Visualising Solid Shapes** - 2 marks (Q14, Q15, Q25)

### Key Features of This Paper:

- ✓ Strictly based on NCERT Class 7 Syllabus 2025-26
- ✓ Includes most expected and important questions
- ✓ Covers all prescribed chapters comprehensively
- ✓ Case study based questions for real-life application
- ✓ Step-by-step solutions with proper working
- ✓ Detailed marking schemes for self-assessment
- ✓ Perfect for annual exam preparation

---

## MATH LOVE INSTITUTE

+91 7869553517 | [www.mathlove.in](http://www.mathlove.in)

Raipur, Chhattisgarh | Indore, Madhya Pradesh

© 2025 Math Love Institute. All Rights Reserved.

**Education is the Foundation of Life | शिक्षा ही जीवन का आधार है**

Comprehensive Coverage: Rational Numbers Operations | Mean, Mode, Median & Range | Profit, Loss & Simple Interest | Area & Perimeter of Various Shapes | Laws of Exponents & Standard Form | Algebraic Expression Operations | 3D Shape Properties

MATH LOVE INSTITUTE

© 2025 -  
CONFIDENTIAL