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CLASS 6 NCERT SAMPLE PAPER MATHS EBOOK

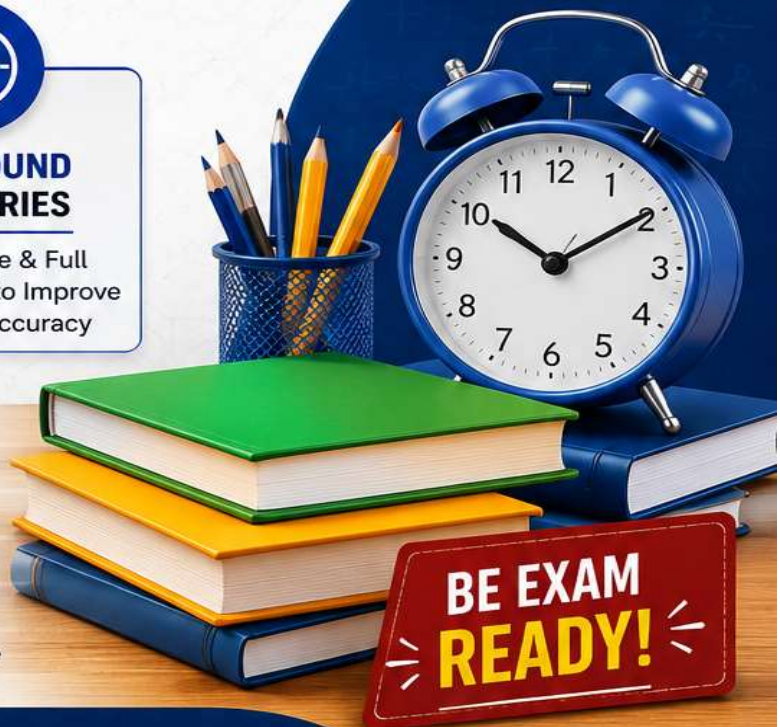
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PRACTICE TODAY, EXCEL TOMORROW

Dedication

Dedicated to the Loving Memory of My Mother "Late Mrs. Shanti Devi Sharma".

This book is lovingly dedicated to my beloved mother, Late Mrs. Shanti Devi Sharma, whose unconditional love, unwavering faith, and countless sacrifices shaped the person I am today.

Although she is no longer physically with me, her values, guidance, and blessings continue to illuminate my path every day. She taught me the importance of education, perseverance, humility, and compassion—lessons that have inspired every step of my journey as a teacher and an author.

Every page of this book carries a reflection of the values she instilled in me. I hope this work serves as a tribute to her beautiful legacy and the countless dreams she nurtured for me.

Her love remains my greatest strength, and her blessings are my constant source of inspiration.

With everlasting love, respect, and gratitude,

Mrs. Sareetam Budholiya

Book Preface

Dear Students, Parents, and Teachers,

It gives me immense pleasure to present this Class 6 CBSE NCERT Sample Paper & Extra Practice Questions book, carefully designed to help students strengthen their understanding of every chapter and develop confidence in examinations.

Education is not just about learning facts; it is about building concepts, developing analytical thinking, and applying knowledge effectively. Keeping this objective in mind, this book has been prepared strictly according to the latest CBSE curriculum and NCERT guidelines.

The book includes:

- Chapter-wise Extra Practice Questions for thorough revision.
- Competency-Based Questions to enhance conceptual understanding.
- MCQs, Short Answer, and Long Answer Questions covering all important topics.
- Case-Based and Application-Based Questions aligned with the latest CBSE examination pattern.
- Sample Papers for complete exam preparation and self-assessment.
- Questions designed to improve logical thinking, problem-solving, and writing skills.

Each exercise has been prepared with great care to ensure that students receive sufficient practice beyond the NCERT textbook. Regular practice with this book will help learners identify their strengths, overcome weaknesses, and perform confidently in school examinations.

I sincerely hope that this book becomes a reliable learning companion for students, a useful teaching resource for educators, and a valuable guide for parents supporting their children's academic journey.

I express my heartfelt gratitude to all teachers, parents, students, and well-wishers for their continuous encouragement and support. Your trust inspires me to create quality educational resources that make learning simple, effective, and enjoyable.

I wish every student great success and a bright future.

Happy Learning!

Mrs. Sareetam Budholiya
MCA | Author | Educationist
20+ Years of Teaching Experience
Author of 10 Educational Books
Krivaansh Edutech

About the Author

Mrs. Sareetam Budholiya is an accomplished educator, author, and mentor with a Master of Computer Applications (MCA) degree and more than 20 years of teaching experience. Throughout her career, she has been dedicated to helping students build strong academic foundations through clear concepts and practical learning.

As the author of 10 educational books, Mrs. Budholiya is committed to creating high-quality, student-friendly study materials that align with the latest CBSE curriculum and NEP 2026–27 guidelines. Her books are known for their simple language, accurate content, and exam-focused approach, making learning easier and more effective for students.

Driven by a passion for education and student success, she continues to inspire young learners through Krivaansh Edutech, with the belief that the right guidance and the right resources can unlock every student's true potential.

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PRACTICE PAPER-1
CHAPTER 01→ PATTERNS IN MATHEMATICS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What comes next in the pattern: 2, 8, 18, 32, 50, ___?
(a) 60 (b) 70 (c) 72 (d) 80

2. If a pattern starts as ◆, ◆◆, ◆◆◆, ◆◆◆◆, how many symbols will the next step have?
(a) 4 (b) 5 (c) 6 (d) 8

3. Find the missing term in: 1, 4, 9, 16, ___, 36.
(a) 20 (b) 24 (c) 25 (d) 30

4. Total sides in 15 hexagons?
(a) 75 (b) 80 (c) 85 (d) 90

5. Pattern rule in 64, 32, 16, 8, ___?
(a) Subtract 8 (b) Divide by 4 (c) Divide by 2 (d) Subtract 16

6. In a pattern, each term is the previous term multiplied by 5. First term is 2. Find 4th term.
(a) 50 (b) 100 (c) 125 (d) 250

7. Find the next number: 3, 7, 15, 31, ____
(a) 47 (b) 53 (c) 63 (d) 65

8. A pattern starts with 100 and halves each time. What is 4th term?
(a) 20 (b) 25 (c) 12.5 (d) 10

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** A pattern of 3, 6, 12, 24, ... has constant differences between terms.
Reason (R): Multiplying by 2 at each step does not create constant differences.

10. **Assertion (A):** A pattern with 1, 4, 9, 16 is a multiplication pattern.
Reason (R): Squaring is a form of multiplication.

SECTION – B

Questions 11 to 14 carry 2 marks each.

Complete and explain: 5000, 2500, 1250, _____, _____.

Pattern: ◆ ● ◆◆ ●● ◆◆◆. Predict next two terms with explanation.

If 20 pentagons are arranged, find total sides. Explain.

Fill missing numbers: 4, 12, 36, _____, 324, __.

SECTION – C

Questions 15 to 17 carry 3 marks each.

11. A tile pattern uses 4 black tiles and 5 white tiles in repetition.
If 270 tiles are used, how many black tiles and white tiles were used?

12. Multiply by 2, subtract 2. Starting at 6. Find first 6 terms.

13. Multiply by 3, subtract 1 pattern, starting from 2.

SECTION – D

Questions 18 carry 5 marks each.

14. A school builds a staircase using blocks:
1st step: 2 blocks, 2nd step: 6 blocks, 3rd step: 12 blocks
4th step: ? 5th step: ?
(a) Identify pattern rule.
(b) Find number of blocks in 4th and 5th steps.
(c) Find total blocks in first 5 steps.
(d) Explain how recognizing this pattern is helpful in planning.
(e) Write pattern in words.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

15. In a newly constructed hotel, a painter was assigned to decorate its 96 walls using a specific stripe pattern for aesthetic appeal. Each wall was to be painted in a repeating sequence of 2 blue stripes followed by 4 red stripes. The hotel owner wanted the pattern consistent throughout the building, making accurate pattern calculation essential for error-free decoration.



(a) How many blue stripes will be needed?
(b) How many red stripes will be needed?
(c) Which stripe color will be at 95th position?
(d) Why is pattern understanding important in such work?

16. During the annual school exhibition, coloured banners were arranged along the main walkway in a repeating sequence of **5 blue banners** followed by **3 yellow banners**. A total of 128 banners were used to decorate the area. Accurate pattern planning was important to maintain the sequence and aesthetic appeal of the event without any mismatch or confusion.



(a) How many blue banners were used in total?
(b) How many yellow banners were used in total?
(c) What colour banner will be at the 125th position?
(d) Why is pattern planning important in such decorations?

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PRACTICE PAPER 02

CHAPTER 01 PATTERNS IN MATHEMATICS

SUBJECT: MATHEMATICS ***MAX. MARKS : 40***

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What comes next in: 2, 5, 10, 17, 26, ___?
(a) 37 (b) 38 (c) 40 (d) 42

2. In a sequence: 1, 3, 7, 15, ___, each term doubles and subtracts 1. What is the missing term?
(a) 30 (b) 31 (c) 29 (d) 32

3. A pattern uses the rule: multiply by 4, subtract 2. First term is 2. What is the 3rd term?
(a) 28 (b) 22 (c) 32 (d) 26

4. If a star pattern begins as ★, ★★★, ★★★★★, ★★★★★★★, how many stars in 6th term?
(a) 9 (b) 10 (c) 11 (d) 13

5. How many sides will there be in 35 decagons?
(a) 300 (b) 350 (c) 360 (d) 380

6. Pattern: 10, 14, 20, 28, ____
(a) 36 (b) 38 (c) 40 (d) 42

7. What is the missing number in: 1, 4, 9, 16, 25, 36, __, 64?
(a) 48 (b) 49 (c) 54 (d) 56

8. A circle pattern starts with 3 circles and triples each step. Find circles in 4th step.
(a) 81 (b) 72 (c) 243 (d) 90

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. **Assertion (A):** The missing number in the pattern 2, 6, 12, ___, 30 is 20.
Reason (R): Each term is obtained by multiplying the previous number by 2.

10. Assertion (A): In the pattern 100, 90, __, 70, the missing number is 80.
Reason (R): The numbers are decreasing by 10 in each step.

SECTION – B
Questions 11 to 14 carry 2 marks each.

11. Complete and explain: 800, 400, 200, 100, ___, ___.

12. Pattern: ◆ ■ ◆◆ ■■ ◆◆◆. Predict next two terms. Explain.

13. Pattern: 3, 7, 15, __, 63
(a) Find the missing number.
(b) Justify your answer.

14. How many sides in total are present in 12 octagons? Show your working.

SECTION – C
Questions 15 to 17 carry 3 marks each.

15. Pattern: 2, 5, 10, 17, 26, __, ___
(a) Find next two terms.
(b) Write the differences between terms.
(c) Identify the logic and complete the pattern.

16. Pattern: 1, 3, 6, 10, 15, ...
(a) What are the 6th and 7th numbers?
(b) Find the sum of the 5th and 6th terms.
(c) What is the difference between 4th and 2nd term?

17. Pattern: 2, 3, 5, 9, 17, ...
(a) Find the next two terms.
(b) What is the 8th term?
(c) Find the sum of the 4th and 5th terms.

SECTION – D
Questions 18 carry 5 marks each.

18. Poles are placed along a road as follows:
1st km: 3 poles
2nd km: 6 poles
3rd km: 12 poles
4th: ?
5th: ?
(a) What pattern do the pole numbers follow?
(b) How many poles on 4th km?
(c) How many poles on 5th km?
(d) Total poles in 5 km?
(e) Difference between poles on 5th and 1st km?

SECTION – E (Case Study Based Questions)
Questions 19 to 20 carry 4 marks each.

19. At a large banquet hall construction site, a tiling company was hired to design a stylish floor. The architect chose a repeating tile pattern to reduce cost and avoid mismatched designs. The company

used a sequence of **3 black tiles followed by 7 white tiles**, continuing this till **500 tiles** were laid. The workers needed to estimate how many tiles of each color were required to avoid shortages during the installation.



Questions based on above information:

(a) How many full tile pattern sets can be formed using 500 tiles?
(b) How many black tiles are used in total?
(c) How many white tiles are used in total?
(d) What will be the color of the 456th tile?

20. For a night football match, a stadium lighting company was tasked with installing decorative lights across the upper deck. The lights were programmed in a repeating pattern: **6 red lights followed by 10 blue lights**. This pattern was followed continuously for a total of **256 lights**. The operations team had to plan the wiring and light order carefully to avoid last-minute confusion and ensure a synchronized lighting show.



Questions based on above information:

(a) How many complete lighting pattern cycles can be made using 256 lights?
(b) How many red lights are used in total?
(c) How many blue lights are used in total?
(d) What will be the colour of the 255th light in the sequence?

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PRACTICE PAPER 03

CHAPTER 01 PATTERNS IN MATHEMATICS

SUBJECT: MATHEMATICS MAX. MARKS : 40

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is the 12th term of the pattern: 1, 4, 9, 16, ...?
(a) 124 (b) 121 (c) 144 (d) 169

2. How many dots are there in the 5th figure of the pattern:
Figure 1: 1 dot
Figure 2: 3 dots
Figure 3: 6 dots
Figure 4: 10 dots
(a) 12 (b) 15 (c) 16 (d) 18

3. What comes next in the sequence: 2, 6, 12, 20, ____
(a) 30 (b) 26 (c) 28 (d) 32

4. Find the number of matchsticks needed to make 6 squares in a row (sharing sides).
(a) 24 (b) 26 (c) 21 (d) 19

5. In a triangle pattern, every new triangle adds 2 extra matchsticks. If 3 triangles need 7 matchsticks, how many are required for 10 triangles?
(a) 21 (b) 25 (c) 22 (d) 19

6. Fill in the blank: 8, 27, 64, ___, 216
(a) 100 (b) 91 (c) 125 (d) 144

7. In a tile pattern using one black tile followed by 2 white tiles, what colour will the 19th tile be?
(a) Black (b) White (c) Both (d) Can't say

8. A square is made using small cubes such that 4 cubes are placed on each side with corners shared. What is the total number of cubes used?
(a) 12 (b) 16 (c) 13 (d) 14

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

(d) A is false but R is true.

9. **Assertion (A):** All cube numbers are odd.
Reason (R): Cubes of even numbers are also even.

10. **Assertion (A):** In an arithmetic pattern, the difference between consecutive numbers remains the same.
Reason (R): The pattern 2, 4, 7, 11 is arithmetic.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Write the 9th term of the pattern formed by adding consecutive odd numbers starting from 1.

12. In a tile pattern, the colours repeat in this order:
Red, Blue, Green, Red, Blue, Green, ...
What will be the colour of the 16th tile?

13. In a pattern of letters: A, C, E, G, I, ...
Which letter will be the 7th in the pattern?

14. Form a number pattern where each term is twice the previous term, starting from 3. Write the 4th and 5th terms.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A pattern of shapes follows:
$\wedge$ = 1st row → 1 shape
$\wedge\wedge$ = 2nd row → 2 shapes
$\wedge\wedge\wedge$ = 3rd row → 3 shapes
Write the number of shapes in 10 rows and total number of shapes till 10th row.

16. A garden has tile designs increasing by square numbers in each row.
Row 1: 1 tile
Row 2: 4 tiles
Row 3: 9 tiles
Row 4: 16 tiles
Find number of tiles in 6th and 8th rows and total tiles till 6th row.

17. A block pattern has the rule: Multiply the term number by itself and subtract 1.
Term 1: 0
Term 2: 3
Term 3: 8
Find the 5th and 6th terms. What is the rule?

SECTION – D

Questions 18 carry 5 marks each.

18. A lantern pattern is built as follows:
The 1st lantern has 5 paper pieces
The 2nd has 9
The 3rd has 13 The 4th has 17

a) Write the rule for the pattern.
b) Find how many pieces are in the 10th lantern.
c) Find the total pieces used to make 10 lanterns.
d) If you have only 200 paper pieces, how many lanterns can you make?

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. At a newly built park, the stone staircase is decorated with beautiful tiles. The first step has 2 tiles, the second has 5 tiles, the third 10 tiles, and the fourth 17 tiles arranged in a specific pattern. Raj, the park supervisor, wants to estimate how many tiles the sixth step will require and the total number of tiles needed to decorate the first six steps, so that he can order the right amount from the tile supplier.



Questions based on above information:

a) What is the pattern rule?
b) How many tiles on the 6th step?
c) Total tiles for 6 steps?
d) If Raj has only 100 tiles, how many steps can he decorate fully?

20. During a local festival, the event organizer arranges decorative lights in rows following a triangular pattern. The first row has 1 light, the second row has 3 lights, the third has 6 lights, and the fourth row has 10 lights, increasing with each row. The organizer needs to know how many lights will be in the ninth row and the total number of lights used across all nine rows to manage the electrical load and budget effectively.



Questions based on above information:

a) Identify the pattern.
b) How many lights in the 9th row?
c) Total lights in 9 rows?
d) If only 120 lights are available, how many rows can be lit fully?

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PRACTICE PAPER 04
CHAPTER 02 LINES AND ANGLES

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A straight angle is equal to the sum of:
(a) two right angles (b) two acute angles
(c) one obtuse and one acute angle (d) two obtuse angles

2. The vertex of an angle is the point:
(a) between two lines (b) where two rays meet
(c) where two segments cross (d) at the center of the circle

3. If $\angle ABC = 90°$ and $\angle CBD = 90°$, then $\angle ABD$ is:
(a) 90° (b) 180° (c) 45° (d) 135°

4. Which angle lies between 90° and 180°?
(a) 60° (b) 170° (c) 30° (d) 85°

5. The sum of angles in a triangle is always:
(a) 90° (b) 180° (c) 270° (d) 360°

6. How many angles are formed when two rays meet at a point and a third ray is drawn between them?
(a) one (b) two (c) three (d) four

7. If $\angle A = 60°$, $\angle B = 70°$, $\angle C = 50°$, then triangle ABC is:
(a) a right-angled triangle (b) an acute-angled triangle
(c) an obtuse-angled triangle (d) a scalene triangle

8. Which of the following is the best example of an angle in real life?
(a) closed book edge (b) pencil tip
(c) open door (d) spoon curve

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

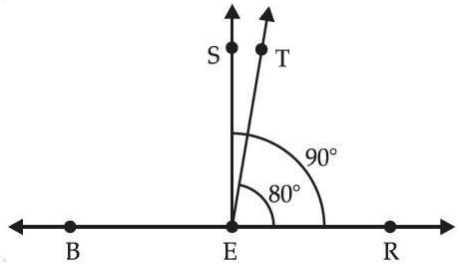
9. **Assertion (A):** A reflex angle is always greater than a straight angle.
Reason (R): A reflex angle is greater than 180° but less than 360°.

10. **Assertion (A):** An acute angle can never be greater than a right angle.
Reason (R): Acute angles are always less than 90°.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. In this figure, ∠TER = 80°. What is the measure of ∠BET? What is the measure of ∠SET?



12. Draw two intersecting lines and label all the angles formed. Name and classify them.

13. Write the steps to draw a 75° angle using a protractor. Name the vertex and arms.

14. A triangle has one right angle and another angle of 30°. Find the third angle. What type of triangle is it?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. You are given a straight angle ∠AOB.
(a) draw it and divide into two right angles
(b) then divide each right angle into two equal parts
(c) how many angles of 45° are formed?

16. Draw angles with the following degree measures: (a) 140°, (b) 82°

17. Draw the letter 'M' such that the angles on the sides are 40° each and the angle in the middle is

SECTION – D

Questions 18 carry 5 marks each.

18. Riya drew a triangle with angles 90°, 45°, and 45°.
(a) identify the type of triangle
(b) draw it with proper markings
(c) draw perpendicular lines from each vertex to the opposite side
(d) how many right angles are formed in the entire construction?
(e) explain how this triangle follows the angle sum property

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Kabir organized a fun classroom challenge during the mathematics exhibition where students had to guess the angles formed between the hour and minute hands of a clock at different times. He asked everyone to calculate the exact angle at specific hours without using a protractor.

For example, at 2:00 PM, the angle formed is **x°**, and at 4:00 PM, the angle formed is **y°**.



(a) find the values of x and y
(b) which angle is greater?
(c) are both angles acute, right, or obtuse?
(d) draw and label both clock faces showing the angles

20. In a school science lab, students were conducting an experiment related to angles and light. To observe the effect of sunlight, a window shade was initially pulled open, forming an angle of 95° with the wall. As the intensity of light needed to be increased, the shade was pulled further, creating a larger obtuse angle of 185°. This setup helped students understand how angles can influence light entry.



(a) what types of angles are these?
(b) how many degrees was the increase?
(c) draw both positions of the shade
(d) what type of angle will it be if the shade turns 270°?

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PRACTICE PAPER 05

CHAPTER 02 LINES AND ANGLES

SUBJECT: MATHEMATICS MAX. MARKS : 40

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. An angle measuring exactly 90° is called a:
(a) Acute angle (b) Right angle (c) Obtuse angle (d) Reflex angle

2. Which of the following best describes a ray?
(a) A line with two endpoints
(b) A part of a line with one endpoint, extending infinitely in one direction
(c) A closed figure
(d) A straight angle

3. The hands of a clock form an angle of 60° at:
(a) 1:00 (b) 2:00 (c) 3:00 (d) 4:00

4. What is the name of the angle that measures 0°?
(a) Right angle (b) Zero angle (c) Straight angle (d) Reflex angle

5. The sum of angles around a point is always:
(a) 90° (b) 180° (c) 270° (d) 360°

6. If two angles around a point are 120° and 150°, what is the measure of the third angle?
(a) 90° (b) 100° (c) 70° (d) 80°

7. Which tool is used to measure angles?
(a) Ruler (b) Compass (c) Protractor (d) Divider

8. Which angle is greater than a right angle but less than a straight angle?
(a) Acute angle (b) Obtuse angle (c) Reflex angle (d) Zero angle

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

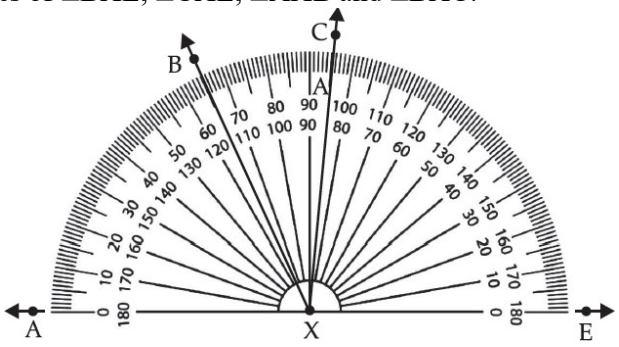
9. **Assertion (A):** A reflex angle measures more than 180° but less than 360°.
   Reason (R): Reflex angles are larger than straight angles.

10. **Assertion (A):** An acute angle is smaller than a right angle.
    Reason (R): Right angle measures exactly 90°.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the degree measures of ∠BXE, ∠CXE, ∠AXB and ∠BXC.



12. Find the missing angle if three angles around a point are 110°, 95°, and 45°.

13. Classify the angle formed between the hands of a clock at 5:00.

14. A circular clock face is divided into 24 equal parts for a 24-hour clock design. The designer wants to calculate the angle between two consecutive marks. Calculate the angle between two adjacent marks.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Use a protractor to draw angles having the following degree measures:
    (a) 110°, (b) 40° , (c) 75°

16. Find the angle between the hands of a clock at 8:00 and classify it.

17. Three angles around a point measure 100°, 85°, and 95°. Find the fourth angle and classify it.

SECTION – D

Questions 18 carry 5 marks each.

18. During a science exhibition, a student uses a protractor to measure angles formed by rays originating from a point. She measures two angles as 135° and 75°. She wonders what the third angle would be if these three rays divide the circle into three parts. Calculate the third angle formed by the rays and classify all three angles.

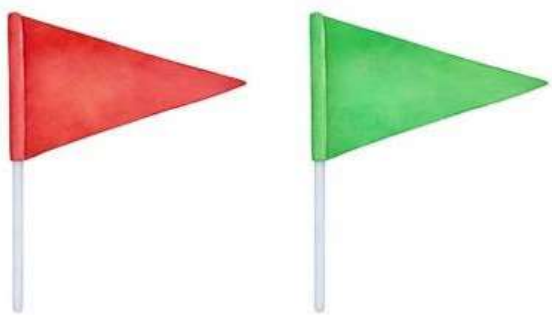
SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Story – The Triangular Flag*

    Riya is helping her school organize the annual sports day. She has been asked to design a triangular flag that will be used to mark the finish line for the races. While drawing the flag, she notes that

two of its angles measure 70° and 55°. Curious to understand more about her design, she decides to find out the third angle of the flag, classify all three angles, and verify if their sum matches the properties of a triangle.



(i) Find the third angle.
(ii) Classify all three angles.
(iii) Verify the total of the angles.

20. *Story – The Stage Lights*

During the annual school play, the stage crew is setting up four spotlights arranged in a circle around the center of the stage. The angles formed between the lights are 85°, 95°, and 110°. To complete the setup perfectly, the crew needs to find the fourth angle, classify all four angles based on their measures, and check if the total of all the angles matches the expected full rotation around a point.



(i) Find the fourth angle.
(ii) Classify all four angles.
(iii) Verify the total.

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PRACTICE PAPER 06

CHAPTER 02 LINES AND ANGLES

SUBJECT: MATHEMATICS MAX. MARKS : 40

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

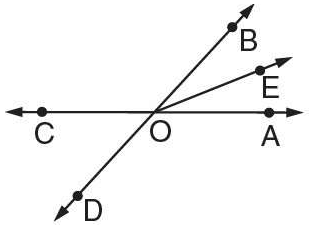
SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A ray divides a straight angle into two angles measuring 110° and _____. What is the missing angle?
(a) 70° (b) 90° (c) 60° (d) 100°

2. Which of the following names the vertex of $\angle PQR$?
(a) *P* (b) *Q* (c) *R* (d) None of these

3. Which of the following rays are the arms of $\angle BOA$?



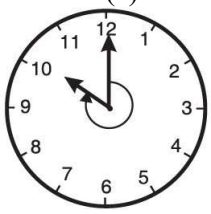
(a) *OB*, *OE* (b) *OE*, *OA* (c) *OB*, *OA* (d) *OC*, *OA*

4. Two angles at a point are 130° and 95°. What is the measure of the third angle at the point?
(a) 135° (b) 95° (c) 120° (d) 135°

5. Which angle is formed between the hour and minute hand of a clock at 6 o'clock?
(a) 90° (b) 180° (c) 45° (d) 60°

6. If one angle is 85°, what is the measure of the adjacent angle on the same straight line?
(a) 95° (b) 85° (c) 180° (d) 75°

7. Which angle is shown by the hands of the clock in the given figure?
(a) acute (b) right (c) obtuse (d) reflex



8. The hands of a clock form a right angle twice in an hour. Which of the following times shows a right angle?
(a) 3:00 (b) 12:00 (c) 4:00 (d) 5:30

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

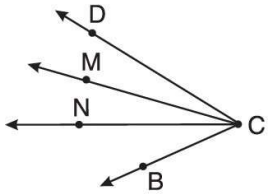
9. **Assertion (A):** A straight angle equals two right angles.
Reason (R): Each right angle measures 90°.

10. **Assertion (A):** The sum of angles at a point is always 360°.
Reason (R): The arms of the angles make a complete turn around the point.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Name the six angles in the given diagram that have *C* as a vertex.



12. Three rays originate from a point forming three angles. If two of the angles measure 85° and 95°, find the third angle. Also state whether it is acute, right, obtuse, or straight.

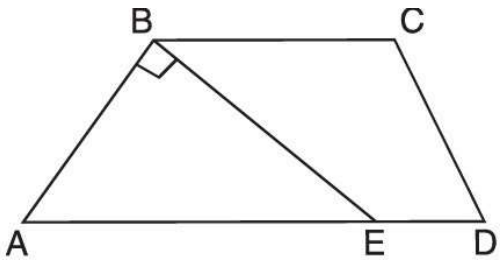
13. Two adjacent angles on a straight line are in the ratio 3:2. Find their measures.

14. The hands of a clock show 9 O'clock. Find the angle between the hands. Is it acute, right, obtuse, or straight?

SECTION – C

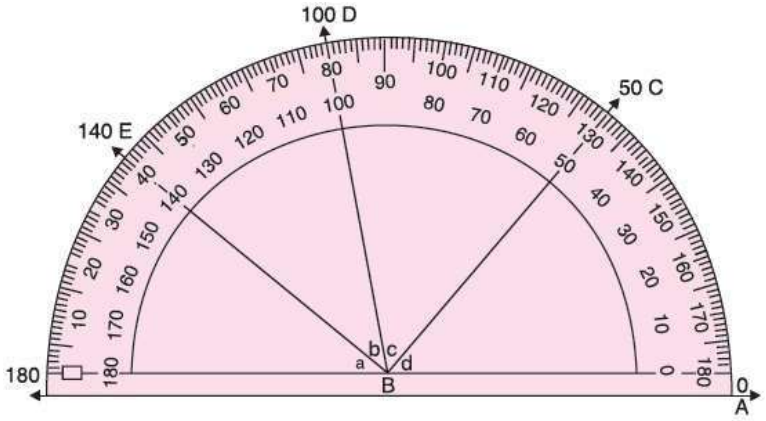
Questions 15 to 17 carry 3 marks each.

15. In the figure name the following angles:



(a) an acute angle at B (b) an acute angle at E (c) a right angle
(d) three obtuse angles (e) a straight angle

16. Using the inner (anticlockwise) scale of the protractor in the below figure, find the measures of (1) $\angle a$, (2) $\angle b$, (3) $\angle c$, (4) $\angle d$, (5) $\angle ABD$, (6) $\angle CBE$.



17. A straight angle is divided into two angles such that one angle is 40° more than the other. Find the two angles.

SECTION – D

Questions 18 carry 5 marks each.

18. A student is playing with a protractor. He places the center of the protractor on the vertex of an angle.

(a) The student measures an angle of 150°. What type of angle is this? What is the difference between this angle and a straight angle?

(b) The student then measures an angle of 30°. What type of angle is this? What is the sum of the 150° and 30° angles?

(c) If the student wants to create an angle of 22.5°, what fraction of a right angle would this be? Show your calculation.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: In a bustling city park, three friends, Alice, Ben, and Chloe, were discussing their afternoon plans. They were standing at a central intersection where three paved walking paths met. Alice pointed to the paths, noting the angles they formed. "Look," she said, "the path to the cafe and the one to the playground form a **120°** angle. And the path to the playground and the one to the rose garden form a **95°** angle."



(a) Find the measure of the third angle.

(b) What is the type of the third angle?

(c) What is the sum of the three angles?

(d) Why is it important that these three paths meet such that their angles add up to this sum?

20. Case Study 2: While staring at the old grandfather clock in Grandma's study, Leo waited for her to finish a phone call. The steady ticking was the only sound in the room. Leo noticed the time was exactly 2 O'clock and the hands formed a sharp, **acute** angle. It was the perfect moment to sneak out and grab a cookie.



(a) Find the measure of this angle.
(b) What type of angle is it?
(c) How will the angle change if the time is 2:30?
(d) Why do clock hands form different types of angles during the day?

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PRACTICE PAPER 07
CHAPTER 03 NUMBER PLAY

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. In a row of 6 children, the sequence of "taller neighbour counts" is 0, 1, 2, 0, 1, 0. Which is correct?
(a) Possible
(b) Impossible because two 0's cannot be separated by a 2
(c) Impossible because ends cannot be both 0
(d) Possible only if heights repeat

2. The centre of a 3×3 grid has neighbours 5320 (up), 5200 (down), 5100 (left), and 5300 (right). Which value makes it a supercell?

	5320	
5100	???	5300
	5200	

(a) 5201 (b) 5310 (c) 5299 (d) 5400

3. Which of these is not a palindromic time in HH:MM 12-hour format?
(a) 03:30 (b) 04:40 (c) 11:22 (d) 05:50

4. What is the digit sum of the smallest 5-digit number divisible by 9?
(a) 3 (b) 9 (c) 18 (d) 27

5. How many times does the digit '0' appear in the numbers from 1 to 50?
(a) 5 (b) 6 (c) 4 (d) 1

6. The largest 4-digit palindrome divisible by 9 is:
(a) 9889 (b) 9779 (c) 9669 (d) 9999

7. Which digit appears most often in the hundreds place from 100 to 999?
(a) 1 (b) 2 (c) 9 (d) All appear equally often

8. In the game "first to 60 wins", moves allowed are 1 to 6, starting at 0. To win, your first move should be:
(a) 4 (b) 5 (c) 6 (d) 3

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. **Assertion (A):** Every 4-digit number with all digits equal does not reach 6174 by Kaprekar's process.
Reason (R): When all digits are equal, subtracting the largest and smallest numbers gives 0, so the process stops immediately.

10. **Assertion (A):** In the Collatz sequence, if the starting number is a power of 2, it takes a certain number of steps to reach 1 by repeatedly dividing by 2.
Reason (R): Each step divides the number by 2, making it smaller until it reaches 1.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the smallest and largest 4-digit number whose digit sum is 9.

12. Identify all supercells in the 3×3 table:

5600	5550	5700
5580	5720	5590
5500	5650	5540

13. Write the smallest 5-digit number whose digit sum is **23**.

14. List all 3-digit palindromes made from digits 4, 6, and 9 (repetition allowed).

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Perform the Kaprekar process for 9013 until 6174 is reached. State steps.

16. Start with the number 59. Reverse its digits and add it to the original number. If the result is not a palindrome, repeat the process with the new number. Find the palindrome number you get after this process.

17. A 4-digit number is formed using the digits 1, 2, 3, and 4 without repetition. What is the difference between the largest possible even number and the smallest possible odd number that can be formed?

SECTION – D

Questions 18 carry 5 marks each.

18. Collatz sequence starting from 19 until reaching 1. Count total steps and state the maximum number reached in the sequence.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Supercell Upgrade:*

In a strategy game, players manage a 4×4 grid of supercells, each represented by a five-digit number. The current grid contains some supercells with special properties. The challenge is to analyze the existing grid, identify all current supercells, and then improve the setup by changing exactly one digit in two different cells to create at least two additional supercells. This task tests your observation and problem-solving skills to optimize the grid layout effectively.

61000	**60800**	**61500**	**61200**
60600	61800	60700	60500
60300	60400	62000	60200
60000	60100	59900	59800

Tasks:

(a) Identify all current supercells.

(b) Change exactly one digit in two cells to create at least 2 more supercells.

20. *Kaprekar Contest*

Three friends—A, B, and C—decided to challenge themselves with a fascinating number puzzle called Kaprekar's routine. Each picked a different four-digit number: A chose 8640, B selected 7032, and C took 5421. Their goal was to apply the Kaprekar steps repeatedly and see how many iterations it takes for each number to reach the mysterious constant 6174. They also wanted to find out who among them would reach 6174 first in this exciting mathematical race.

(a) How many steps for each?

(b) Who reaches 6174 first?

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PRACTICE PAPER 08
CHAPTER 03 NUMBER PLAY
SUBJECT: MATHEMATICS MAX. MARKS : 40

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is the smallest 3-digit number that is a multiple of 15?
(a) 100 (b) 105 (c) 110 (d) 115

2. A 4-digit palindrome is a number that reads the same forwards and backwards. The thousands digit is 4. What is the units digit?
(a) 1 (b) 4 (c) 0 (d) Cannot be determined

3. How many times does the digit '3' appear in the numbers from 1 to 40?
(a) 3 (b) 4 (c) 13 (d) 14

4. A **supercell** is a number that is larger than all its adjacent cells. In the table below, which number is a supercell?

28	31	38
30	40	36
29	32	34

(a) 38 (b) 40 (c) 36 (d) 35

5. What is the largest 3-digit number whose digits are all odd and different?
(a) 975 (b) 957 (c) 795 (d) 973

6. Which of the following numbers will not reach **Kaprekar's constant** for 3-digit numbers?
(a) 123 (b) 543 (c) 555 (d) 864

7. What is the smallest odd number that can be formed using the digits 4, 1, 8, and 3?
(a) 1348 (b) 1483 (c) 1843 (d) 3148

8. What is the digit sum of the number 4^2?
(a) 4 (b) 16 (c) 7 (d) 1

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.
(d) A is false but R is true.

9. Assertion (A): All 4-digit numbers with a digit sum of 36 are palindromes.
Reason (R): The only 4-digit number with a digit sum of 36 is 9999, which is a palindrome.

10. Assertion (A): The sum of two prime numbers is always an even number.
Reason (R): All prime numbers except for 2 are odd numbers.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. What is the number of times the digit '2' appears in the numbers from 1 to 30?

12. Find the smallest and largest 3-digit numbers whose digits are all different.

13. Write down the complete **Collatz sequence** for the starting number 10.

14. How many 2-digit numbers have a digit sum of 1?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Find the smallest and largest 4-digit numbers whose digit sum is 3.

16. Explain why the number 693 will reach the **Kaprekar's constant** of 495. Show the first two steps.

17. Complete the magic square below using the numbers 1-9 without repetition. The magic sum is 15.

4	9	
	5	
8	1	

SECTION – D

Questions 18 carry 5 marks each.

18. Explain the Kaprekar's constant for 4-digit numbers with a detailed example. Choose a starting number of your choice and show the complete sequence of steps.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study: The Palindrome Puzzle

An ancient diary lay on a dusty shelf, its pages brittle with age. A young history enthusiast, Alex, stumbled upon a riddle inside: "To open the secret compartment, enter a five-digit password." The only clues were cryptic—it was a **palindrome**, the hundreds digit was **7**, and the sum of all its digits was **21**. Alex knew this was the key to an untold story.

(a) What is the structure of a 5-digit palindrome? [1 mark]
(b) Find the password. Show your step-by-step reasoning. [3 marks]

20. Case Study: The Collatz Sequence

The teacher had just introduced the fascinating concept of the **Collatz sequence**, and it immediately captured young Sarah's imagination. Unlike other math problems, this one felt like a journey with no map. Her challenge was to take the number **13** and follow the mysterious rules: if the number was even, she had to halve it; if it was odd, she had to multiply it by three and add one. Sarah eagerly grabbed her pencil, ready to see where the sequence would lead her.

(a) What are the rules for the Collatz sequence? [1 mark]
(b) Show the steps for the number 13 to reach 1. [3 marks]

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PRACTICE PAPER 09

CHAPTER 03 NUMBER PLAY

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is the largest 4-digit number that is a multiple of 13?
(a) 9998 (b) 9997 (c) 9993 (d) 9984

2. A 5-digit number is a palindrome. The sum of the digits is 28. The hundreds digit is 8. What is the number?
(a) 37873 (b) 46864 (c) 55855 (d) All the above

3. How many times does the digit '7' appear in the numbers from 1 to 80?
(a) 16 (b) 17 (c) 18 (d) 19

4. A **supercell** is a number that is larger than all its adjacent cells. In the table below, which number is the supercell?

85	88	83
82	90	86
80	87	84

(a) 88 (b) 90 (c) 87 (d) 85

5. Which of the following numbers will not reach **Kaprekar's constant** for 4-digit numbers?
(a) 4321 (b) 1111 (c) 5432 (d) 7654

6. What is the smallest odd number that can be formed using the digits 7, 0, 9, and 2?
(a) 2079 (b) 2097 (c) 2709 (d) 2790

7. What is the digit sum of the number $2 \times 2 \times 2 \times 2 \times 2$?
(a) 7 (b) 5 (c) 3 (d) 9

8. What is the largest even number that can be formed using the digits 6, 0, 9, and 2?
(a) 9620 (b) 9602 (c) 9260 (d) 9206

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.

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

9. **Assertion (A):** The largest number that can be formed using the digits 8, 6, 3, and 2 is 8632.
Reason (R): To form the largest number from a set of digits, arrange the digits in ascending order.

10. **Assertion (A):** The number 196 is a palindromic number.
Reason (R): Palindromic numbers read the same from left to right and from right to left.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. What is the number of times the digit '8' appears in the numbers from 1 to 90?

12. Find the smallest and largest 3-digit numbers whose digits are all different and odd.

13. Find the palindrome that is reached after one step of the **reverse-and-add** method, starting with the number 48.

14. How many 4-digit numbers have a digit sum of 3?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. List all 3-digit palindromes using digits 2, 4, and 7.

16. Using digits 3, 5, 6, 9, find largest and smallest 4-digit numbers, their sum, and difference.

17. Complete the magic square below using the numbers 1-9 without repetition. Explain how you found the missing numbers. The magic sum is 15.

	3	8
	5	
2	7	

SECTION – D

Questions 18 carry 5 marks each.

18. Explain the Collatz sequence with a detailed example. Show the complete sequence starting from 20 until it reaches 1.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study: The Palindrome Puzzle

Dr. Anya's lab was a maze of computers, all guarded by a single code. Her assistant, Leo, had to enter the password to access the research. He remembered the three clues Dr. Anya had given him. "It's a five-digit palindrome," he muttered to himself, "The sum of its digits is **25**, and the hundreds digit is **7**." Leo's fingers hovered over the keypad, ready to unlock the secret.



(a) What is the structure of a 5-digit palindrome? [1 mark]
(b) Find the password. Show your step-by-step reasoning. [3 marks]

20. Case Study: Kaprekar's sequence



A student had always found math problems a bit tedious, but this one was different. His teacher had given him a challenging puzzle: start with the number 9210 and find its Kaprekar's sequence. "Kaprekar's sequence?" he thought. "It sounds like a secret code." As he began arranging the digits and performing the subtractions, he felt like a detective, getting closer to a hidden secret with each step.

(a) What is Kaprekar's constant for 4-digit numbers? [1 mark]
(b) Show the steps for the number 9210 to reach the constant. [3 marks]

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PRACTICE PAPER 10

CHAPTER 04 DATA HANDLINGS AND PRESENTATIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A student is asked to find the favourite subject of students in a class. What is the first step in this process?
(a) Make a frequency table (b) Collect the raw data
(c) Draw a bar graph (d) Assume the most popular subject

2. In a pictograph where a symbol ▲ represents 10 trees, how would you represent 75 trees?
(a) ▲▲▲▲▲▲▲ and a half ▲
(b) ▲▲▲▲▲▲▲▲
(c) ▲▲▲▲▲▲▲
(d) ▲▲▲▲▲▲

3. A bar graph has a scale of 1 unit length = 25 kg. What is the total weight represented by two bars of heights 8 units and 10 units respectively?
(a) 18 kg (b) 250 kg (c) 450 kg (d) 200 kg

4. A bar graph representing the number of runs scored in a cricket match has a scale of 1 unit length = 5 runs. If a player scored 85 runs, what would be the height of the bar?
(a) 17 units (b) 15 units (c) 85 units (d) 5 units

5. A pictograph uses a symbol to represent 20 cars. To represent 140 cars, how many symbols would be required?
(a) 14 (b) 7 (c) 20 (d) 28

6. To find the total number of items in a frequency table, you should:
(a) Add the values of the items. (b) Add the frequencies.
(c) Multiply the values by their frequencies. (d) Add the tally marks.

7. A pictograph shows the number of cars passing a point in an hour, using the key = 20 cars. If the number of symbols is 3 complete cars and a half car, how many cars passed?
(a) 35 (b) 60 (c) 70 (d) 65

8. The number of students in a class is 40. A bar graph is drawn with a scale of 1 unit length = 2 students. What is the height of the bar for this class?
(a) 40 units (b) 20 units (c) 10 units (d) 80 units

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. **Assertion (A):** In a bar graph, if the frequencies are large, a scale of 1 unit length = 1 frequency is often not suitable.

Reason (R): Using a 1:1 scale for large frequencies would make the bars too long to fit on the paper.

10. **Assertion (A):** The length or height of a bar in a bar graph represents the given number or frequency.

Reason (R): Bar graphs are used to represent data through pictures of objects.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A teacher collected data on the number of students who forgot their lunch box over a period of 5 days: 3, 5, 2, 0, 4. What is the minimum and maximum number of students who forgot their lunch box? How many students forgot their lunch box in total over the 5 days?

12. A pictograph uses a symbol to represent 10 trees. If a village planted 120 trees, 145 trees, and 90 trees in three consecutive years, how would you represent 145 trees using the given symbol?

13. The population of a city in different years is given as:
2001: 50,000, 2011: 75,000, 2021: 1,00,000.

If a bar graph is drawn with a scale of 1 unit length = 5,000 people, what would be the height of the bars for the years 2001 and 2021?

14. The following data shows the number of cars passing a toll plaza in 6 different hours:
150, 200, 150, 250, 100, 200.

How many times did 150 cars pass in an hour, and what is the total number of cars that passed in the given 6 hours?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A family's monthly expenditure on different items is as follows:
House rent: ₹2500
Food: ₹4000 Education:
₹2000 Transport: ₹1500

Choose a suitable scale and calculate the height of the bars for each item if you were to represent this data using a bar graph.

16. The marks obtained by 15 students in a class test out of 20 are:
15, 18, 12, 15, 18, 15, 12, 10, 18, 15, 18, 12, 15, 15, 15.
(a) Organize the data using a frequency table with tally marks.
(b) What is the most common mark obtained by the students?

17. A pictograph represents the number of cars manufactured by a company over a few years, with the key 🚗 = 500 cars.

(a) If the company manufactured 3250 cars in a year, how many symbols would be needed?

(b) What is the total number of cars represented by 5 complete symbols and a half symbol?

SECTION – D

Questions 18 carry 5 marks each.

18. The number of students who joined different clubs in a school is as follows:

Science Club: 60, Math Club: 45, Art Club: 75, Music Club: 30, Drama Club: 60.

(a) Prepare a frequency distribution table for the given data.

(b) Draw a bar graph to illustrate this data, choosing a suitable scale.

(c) Which club has the maximum number of students, and how many more students does it have compared to the Music Club?

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: The Class Birthday Chart

In Mrs. Sharma's classroom, a sense of excitement fills the air as the students work on a vibrant birthday chart. Each month is getting its own special column. To make the chart visually appealing and easy to read, they've decided to use a pictograph. The simple, cheerful symbol of a balloon 🎈 will be their key, with each balloon representing two students' birthdays. The data they have for the number of birthdays each month is:

- January: 6
- February: 8
- March: 10
- April: 4

(a) How many birthday symbols would be needed to represent the birthdays in March?

(b) How many more birthdays were in February than in April?

(c) If the class has a total of 30 students, how many birthdays occurred in the months not listed?

(d) To make the pictograph for April, how would you use the symbol 🎁?

20. Case Study 2: The Supermarket Survey

A local supermarket is on a mission to stock its shelves with the fruits its customers love most. To get a clear picture of consumer preferences, they conducted a detailed survey. They recorded the first 50 responses from shoppers, asking them to name their favorite fruit. The results are:

- Apple: 15
- Banana: 10
- Mango: 12
- Grapes: 8
- Orange: 5

(a) What is the total number of responses recorded in this survey?

(b) Which fruit has the lowest frequency?

(c) If a bar graph is created with a scale of 1 unit length = 2 customers, what would be the height of the bar for Mangoes?

(d) How many more customers prefer Apples than Grapes?

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PRACTICE PAPER 11

CHAPTER 04 DATA HANDLINGS AND PRESENTATIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. The number of students absent from a class over 6 days is: 3, 5, 2, 0, 4, 3. What is the maximum frequency of absent students?

(a) 0 (b) 1 (c) 2 (d) 3

2. A bar graph has a scale of 1 unit length = 50 books. What is the total number of books represented by bars with heights of 6 units and 9 units?

(a) 15 books (b) 500 books (c) 750 books (d) 150 books

3. A pictograph uses the symbol to represent 20 bicycles. How would you represent 70 bicycles?

(a) (b) and a half

(c) and a half (d)

4. A bar graph shows the population of a village over several years. The vertical axis represents the population in hundreds, and the scale is 1 unit = 500 people. If a bar is 10 units high, what is the population?

(a) 5000 (b) 500 (c) 1000 (d) 100

5. A survey was conducted on favorite sports: Football (15), Cricket (20), Basketball (10), Tennis (5). How many more students prefer Cricket than Tennis?

(a) 15 (b) 20 (c) 10 (d) 5

6. In a pictograph, a symbol represents 5 balloons. To represent 28 balloons, how many symbols would you need?

(a) 5 complete symbols and a partial symbol (b) 5 complete symbols and a half symbol

(c) 6 complete symbols (d) 5 complete symbols

7. A bar graph represents the number of movies watched by students. The scale is 1 unit length = 2 movies. If a student watched 8 movies, what would be the height of the bar?

(a) 8 units (b) 2 units (c) 4 units (d) 16 units

8. A student collected data on the number of flowers in 5 gardens: 10, 15, 8, 12, 10. The range of this data is:

(a) 5 (b) 7 (c) 10 (d) 1

9 and 10 Question options:-

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

9. **Assertion (A):** Organizing data into a frequency distribution table helps in finding the mode of the data easily.
Reason (R): The frequency table shows the number of times each value appears, making the most frequent value (mode) evident.

10. **Assertion (A):** Bar graphs and pictographs can both be used to represent the same set of data.
Reason (R): A pictograph is a visual representation of data using pictures, while a bar graph uses bars of uniform width.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A survey was conducted on the number of books read by 10 students in a month:
4, 2, 5, 3, 4, 1, 5, 4, 2, 3.
Arrange the data in ascending order. What is the most common number of books read?

12. A bar graph shows the number of cars passing a point. The bar for Monday is 8 units high, and the bar for Tuesday is 11 units high. If the scale is 1 unit length = 15 cars, what is the total number of cars that passed on both days?

13. A pictograph uses the symbol | to represent 25 trees. How many symbols are needed to represent 150 trees? What would be the total number of trees if the pictograph had 5 and a half symbols?

14. The following data shows the marks obtained by a student in 5 subjects out of 100:

English: 85, Math: 95, Science: 80, Social Studies: 75, Hindi: 90.

If a bar graph is drawn with a scale of 1 unit length = 5 marks, what would be the height of the bars for Math and Science?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. The number of students who joined different sports clubs in a school is as follows:

Football: 25, Cricket: 40, Basketball: 30, Tennis: 15.

(a) Represent this data using tally marks in a frequency distribution table.
(b) Which club has the least number of students?

16. A pictograph represents the number of toys sold by a shop over 4 days. The key is ✓ = 5 toys.

Monday: ✓✓✓✓✓
Tuesday: ✓✓✓✓✓✓✓
Wednesday: ✓✓✓✓ Thursday: ✓✓✓

(a) What was the total number of toys sold over the 4 days?
(b) What was the difference between the number of toys sold on Tuesday and Wednesday?

17. A family's monthly expenditure on food, rent, and savings is ₹5000, ₹8000, and ₹2000 respectively. They want to represent this data on a bar graph with a scale of 1 unit length = ₹1000. Calculate the height of the bars for each category.

SECTION – D

Questions 18 carry 5 marks each.

18. The number of visitors to a zoo on five consecutive days is recorded as: **Monday: 300, Tuesday: 400, Wednesday: 250, Thursday: 500, Friday: 350.**

(a) Prepare a frequency distribution table for this data.

(b) Draw a bar graph to represent the data, choosing a suitable scale.

(c) What is the average number of visitors per day for these five days?

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: The School's Green Initiative

The students of a school organized a "Green Initiative" to plant saplings in the school campus. They collected data on the number of saplings planted by each class. They prepared a pictograph to showcase this effort, using a symbol ⥤ to represent 10 saplings.

A half-⥤ symbol represents **5** saplings.

Class 6: ▲▲▲▲ (40 saplings)

Class 7: ▲▲▲▲▲ (50 saplings)

Class 8: ▲▲▲▲▲▲ (60 saplings)

Class 9: ▲▲▲▲ and a half ▲ (45 saplings)

Class 10: ▲▲▲▲▲ and a half ▲ (55 saplings) Based on this information, answer the following questions:

(a) How would the number of saplings planted by Class 9 be represented?

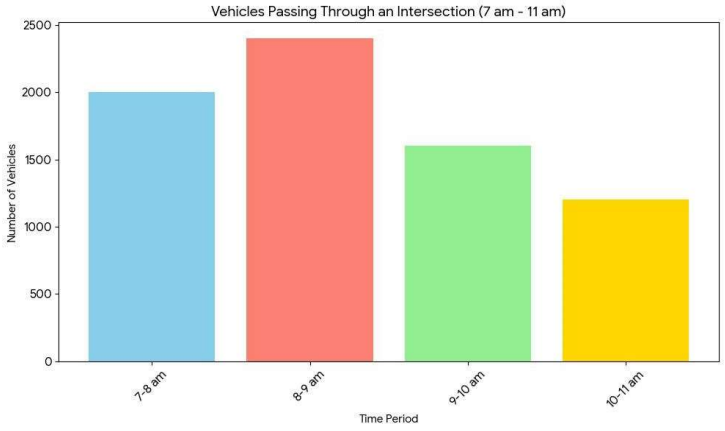
(b) What is the difference in the number of symbols used for Class 8 and Class 7?

(c) What is the total number of saplings planted by the school?

(d) If the scale was changed to ⥤ 5 saplings, what would be the number of symbols needed for Class 10?

20. Case Study 2: Daily Traffic Count

A traffic police officer recorded the number of vehicles passing through an intersection in a busy city over four different hours. The data is represented in the bar graph below, where the scale is 1 unit length = 200 vehicles.



Based on the bar graph, answer the following questions:

(a) What was the total number of vehicles that passed through the intersection between 7 am and 11 am?

(b) In which hour was the traffic the heaviest, and how many vehicles passed during that time?

(c) How many more vehicles passed between 8-9 am compared to 9-10 am?

(d) What is the combined total of vehicles for the two hours with the least traffic?

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PRACTICE PAPER 12

CHAPTER 04 DATA HANDLINGS AND PRESENTATIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A survey of 40 students was conducted to find their favorite sport. The data showed that 10 students like Cricket, 15 like Football, 8 like Badminton, and the rest like Hockey. What is the frequency of students who like Hockey?

(a) 5 (b) 7 (c) 8 (d) 10

2. A bar graph has a scale of 1 unit length = 15 kg. A bar for the weight of a student is 5 units tall. What is the student's weight?

(a) 5 kg (b) 20 kg (c) 75 kg (d) 15 kg

3. A pictograph uses the symbol to represent 25 buses. How would you represent 112 buses?

(a) (b) and a half

(c) (d)

4. A bar graph shows the number of trees planted on five different days. The bar for Monday has a height of 6 units. If the scale is 1 unit length = 10 trees, how many trees were planted on Monday?

(a) 6 trees (b) 60 trees (c) 16 trees (d) 600 trees

5. A pictograph represents the number of cars sold by a dealer. The key is = 5 cars. If the dealer sold 45 cars, how many symbols would be required?

(a) 45 (b) 9 (c) 5 (d) 10

6. The heights of five students are 145 cm, 150 cm, 148 cm, 150 cm, and 147 cm. How many students have a height of at least 150 cm?

(a) 1 (b) 2 (c) 3 (d) 4

7. A bar graph shows the population of a town over several years. The vertical axis represents the population in thousands, and the scale is 1 unit = 5000 people. If a bar is 15 units high, what is the population?

(a) 15,000 (b) 7500 (c) 75,000 (d) 1500

8. In a pictograph, a symbol represents 5 footballs. To represent 12 footballs, how many symbols would you need?

(a) 2 complete symbols and a partial symbol (b) 2 complete symbols and a half symbol
(c) 1 complete symbol and a partial symbol (d) 2 complete symbols

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. **Assertion (A):** In a bar graph with a scale of 1 unit length = 100 people, a bar of height 8 units and a bar of height 12 units represent a total of 2000 people.

Reason (R): The total number of people is calculated by adding the unit lengths of the bars and multiplying by the scale.

10. **Assertion (A):** In a pictograph, a single symbol can be used to represent a large number of items.
Reason (R): This is necessary when the data values are very large, as it prevents the pictograph from becoming cluttered and difficult to read.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. The following data shows the number of absent students in a class over a week:

Monday: 4, Tuesday: 2, Wednesday: 5, Thursday: 1, Friday: 3.

If a teacher wants to represent this data using a pictograph with the symbol ● = 1 student, how would she show the data for Wednesday and Friday?

12. A bar graph shows the number of students in each class. The bar for Class 6 is 12 units high, and the bar for Class 7 is 15 units high. If the scale is 1 unit length = 5 students, what is the total number of students in both classes?

13. Arrange the following raw data set in ascending order and find the smallest and largest values:
15, 22, 10, 18, 25, 15, 22, 10, 20.
How many times does the value 15 appear in this dataset?

14. A survey was conducted to find the favorite colors of students. The results were: Blue (8), Red (12), Green (6), Yellow (4), Pink (10). Prepare a frequency table using tally marks for this data.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. The marks obtained by 20 students in a math test (out of 10) are as follows:
7, 8, 5, 9, 7, 6, 8, 7, 5, 9, 8, 6, 7, 10, 8, 9, 7, 6, 8, 5

Prepare a frequency distribution table using tally marks. What is the most frequently occurring mark?

16. A pictograph shows the number of apples sold by a vendor over four days. The key is ● = 10 apples.

Monday: ●●●●
Tuesday: ●●●●●
Wednesday: ●●●
Thursday: ●●●●●●

(a) How many more apples were sold on Thursday than on Wednesday?
(b) What was the total number of apples sold during the four days?

17. A family's monthly budget is ₹15,000. They spend ₹5,000 on food, ₹3,000 on education, and ₹2,500 on transport. They want to create a bar graph to represent this. Using a scale of 1 unit length = ₹500, calculate the height of the bars for food, education, and transport.

SECTION – D

Questions 18 carry 5 marks each.

18. A school cafeteria recorded the number of meals sold each day for a week. The data is as follows:

Monday: 300, Tuesday: 450, Wednesday: 250, Thursday: 500, Friday: 400.

(a) Prepare a frequency distribution table for this data.

(b) Draw a bar graph to represent the data, choosing an appropriate scale.

(c) On which day was the most number of meals sold, and how many more meals were sold on that day compared to the day with the least number of sales?

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: The Bird Watchers' Club

A group of friends started a bird-watching club in their village. They decided to count the number of different types of birds they saw in the village park over a week. The following data was collected:

Sparrows: 25

Pigeons: 40

Crows: 35

Parrots: 15

They decided to make a pictograph to present their findings to other villagers. They chose a symbol 🐦 to represent 5 birds.

Based on the information above, answer the following questions:

(a) How many symbols will be needed to represent the number of crows?

(b) Which bird was seen the most, and how many symbols would it have?

(c) What is the total number of symbols needed to represent all the birds?

(d) One of the friends suggested a scale of 🐦 = 1 bird. What is the number of symbols needed with this scale and why is it not a good choice?

20. Case Study 2: School Library Book Circulation

A librarian wanted to understand the reading habits of students in classes 1 to 5. She collected data on the number of books issued to students in each class during a specific month. The data is as follows:

Class 1: 30 books

Class 2: 45 books

Class 3: 50 books

Class 4: 25 books

Class 5: 30 books

She decided to present this data using a bar graph with a suitable scale to make it easy to understand for the school principal.

Based on the information above, answer the following questions:

(a) Using a scale of 1 unit length = 5 books, what would be the height of the bar for Class 2?

(b) What is the combined total of books issued to the classes with the least number of books?

(c) Compare the number of books issued in Class 1 and Class 5. What does this tell you?

(d) How much taller is the bar for Class 3 compared to the bar for Class 4 if the scale is 1 unit length = 5 books?

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PRACTICE PAPER 13

CHAPTER 05 PRIME TIME

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is the prime factorization of 108?
(a) $2^2 \times 3^3$ (b) $2^3 \times 3^2$ (c) 2×3^2 (d) 2×3^3

2. Which of the following is not a prime number?
(a) 53 (b) 67 (c) 73 (d) 87

3. Which of the following numbers is divisible by 5?
(a) 438 (b) 561 (c) 750 (d) 993

4. How many multiples of 9 are there between 100 and 200?
(a) 10 (b) 11 (c) 12 (d) 13

5. What is the smallest digit that must be placed in the blank space of 56_8 to make it divisible by 3?
(a) 1 (b) 2 (c) 3 (d) 4

6. Which of the following is the prime factorization of 490?
(a) 2 × 5 × 7 × 7 (b) 2 × 5 × 5 × 7 (c) 2 × 3 × 5 × 7 (d) 5 × 7 × 7 × 3

7. A number when divided by 6 leaves a remainder of 3. What could the number be if it is between 50 and 60?
(a) 51 (b) 54 (c) 57 (d) 58

8. Which of the following is an incorrect statement?
(a) The smallest composite number is 4.
(b) The number 1 is a prime number.
(c) Every prime number is odd except 2.
(d) The smallest prime number is 2.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. **Assertion (A):** The numbers 2 and 3 are co-prime.
Reason (R): Two numbers are co-prime if they have no common factors other than 1.

10. **Assertion (A):** The number 972 is divisible by 9.
Reason (R): The sum of the digits of 972 is 18, and 18 is divisible by 9.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the smallest number that is divisible by 9, 15, and 24.

12. Using the divisibility test for 4, determine if 984 is divisible by 4. Explain your answer.

13. Write the prime factorization of 999.

14. State the divisibility rule for 9 and check if the number 729 is divisible by 9.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Find a number between 400 and 500 that is a multiple of 6, 9, and 12.

16. Which of the numbers 1234, 5678, and 9012 is divisible by 4 and 8? Explain your reasoning using divisibility rules.

17. A number when divided by 7 leaves a remainder of 1. What is the smallest such 3-digit number that is a multiple of 4?

SECTION – D

Questions 18 carry 5 marks each.

18. Find the largest 4-digit number that is a common multiple of 24, 32, and 40.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: The School Field Trip

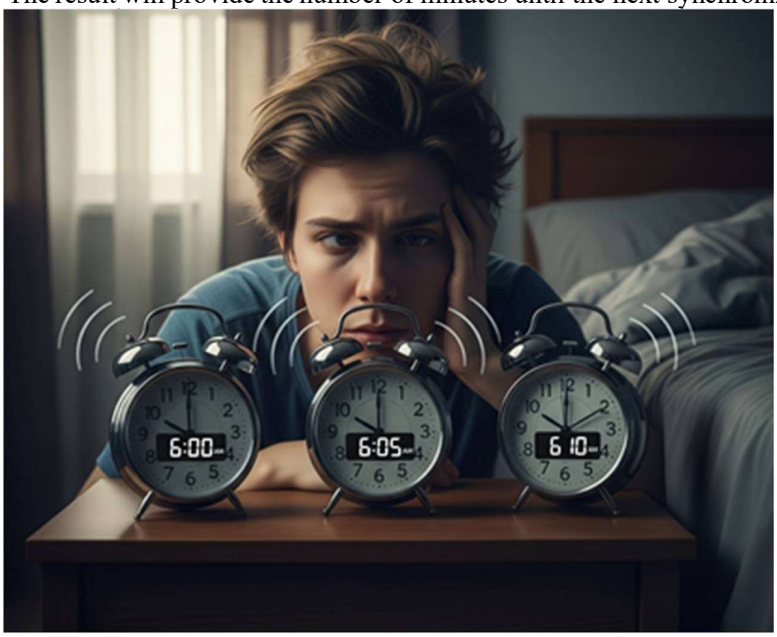
A school is planning a field trip for its students. There are 288 students from class 6 and 432 students from class 7. The school wants to hire the largest possible buses, with each bus carrying the same number of students. Each bus must only have students from a single class to keep the groups separate. To minimize the number of buses needed, the school must find the greatest number of students that can fit on each bus. The solution is the greatest common factor of the two student numbers.



(a) Find the prime factorization of 288.
(b) Find the prime factorization of 432.
(c) Determine the largest number that is a factor of both 288 and 432.
(d) Use the divisibility rule for 9 to show that 432 is divisible by 9.

20. Case Study 2: The Clock Alarms ₹

A person sets three different alarms to wake up. The first alarm rings every 15 minutes, the second every 20 minutes, and the third every 30 minutes. They all just went off at 6:00 AM. The person wants to know the exact time when all three alarms will ring together again. To solve this, they must find the least common multiple of the three time intervals. The result will provide the number of minutes until the next synchronized alarm.



(a) Find the prime factorization of 15.
(b) Find the prime factorization of 20.
(c) Find the smallest number that is a multiple of 15, 20, and 30
(d) At what time will all three alarms ring together again?

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PRACTICE PAPER 14
CHAPTER 05 PRIME TIME

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is the prime factorization of 252?
(a) $2^2 \times 3^2 \times 7$ (b) $2 \times 3^2 \times 7$ (c) $2^2 \times 3 \times 7$ (d) $2 \times 3 \times 7^2$

2. Which of the following is not a composite number?
(a) 27 (b) 39 (c) 51 (d) 61

3. Which of the following numbers is divisible by 11?
(a) 1245 (b) 1331 (c) 2578 (d) 3145

4. What is the smallest prime number?
(a) 0 (b) 1 (c) 2 (d) 3

5. What is the smallest number that must be added to 110 to make it divisible by 8?
(a) 2 (b) 4 (c) 6 (d) 8

6. Which of the following is the prime factorization of 630?
(a) 2 × 3 × 3 × 5 × 7 (b) 2 × 3 × 5 × 7 × 7
(c) 2 × 3 × 3 × 5 × 5 (d) 2 × 3 × 5 × 7

7. Which of the following numbers is divisible by 4 but not by 8?
(a) 124 (b) 256 (c) 312 (d) 420

8. Which of the following statements is true?
(a) All even numbers are composite.
(b) If a number is divisible by 12, it is also divisible by 4.
(c) Every number has at least three factors.
(d) Every prime number is odd.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. **Assertion (A):** The number 732 is divisible by 3.
Reason (R): The sum of the digits of 732 is 12, which is a multiple of 3.

10. **Assertion (A):** The number 51 is a composite number.
Reason (R): The sum of the digits of 51 is 6, which is divisible by 3, so 51 is divisible by 3.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the smallest number that is divisible by 16, 24, and 32.

12. Find the greatest common factor of 252 and 360.

13. Find the prime factorization of 735.

14. Is the number 9135 divisible by 5 and 7? Explain your answer.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Find a number between 200 and 300 that has a prime factor of 13 and is a multiple of 6.

16. Using the divisibility test for 11, check if the numbers 121 and 1331 are divisible by 11. Explain your reasoning.

17. A number when divided by 8 leaves a remainder of 3. What is the largest such 2-digit number that is also a multiple of 5?

SECTION – D

Questions 18 carry 5 marks each.

18. Find the smallest number that is a common multiple of all numbers from 1 to 10.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: The Gardener's Plants

A gardener, Mr. Kumar, has 180 rose plants and 270 jasmine plants. He wants to arrange them in rows with the same number of plants in each row. Each row must contain only one type of plant. To plant the maximum number of plants in a single row, he must determine the greatest common factor of the number of rose and jasmine plants. This will help him create the most efficient layout and ensure no plants are left out.



(a) Find the prime factorization of 180.
(b) Find the prime factorization of 270.
(c) What is the greatest common factor of 180 and 270?
(d) Use the divisibility rule for 10 to show that the largest common number of plants per row (the answer to part c) is divisible by 10.

20. Case Study 2: The Bus Schedule

Two buses, Bus A and Bus B, depart from the same station at the same time. Bus A completes its route and returns to the station every 25 minutes, while Bus B returns every 30 minutes. A passenger wants to know when both buses will next be at the station together. To figure this out, the passenger needs to find the least common multiple of their departure intervals. The result will tell them the number of minutes until the next time the two buses will be at the station at the exact same moment.



(a) What are the prime factors of 25?
(b) What are the prime factors of 30?
(c) Find the smallest number that is a multiple of 25 and 30.
(d) Based on your answer from (c), after how many minutes will both buses be at the station together again?

KRIVAANSH EDUTECH - 8826799505
PRACTICE PAPER 15
CHAPTER 05 PRIME TIME

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is the prime factorization of 84?
(a) $2\times3\times7$ (b) $2^2\times3\times7$ (c) $2\times3^2\times7$ (d) $2^2\times3^2\times7$

2. Which of the following numbers is a multiple of both 3 and 7?
(a) 21 (b) 27 (c) 35 (d) 42

3. Which of the following numbers is divisible by 9?
(a) 1532 (b) 2187 (c) 3457 (d) 4238

4. How many prime numbers are there between 20 and 50?
(a) 6 (b) 7 (c) 8 (d) 9

5. What is the smallest number that must be added to 540 to make it divisible by 7?
(a) 3 (b) 4 (c) 5 (d) 6

6. Which of the following numbers is divisible by 6?
(a) 412 (b) 514 (c) 618 (d) 724

7. A number is a multiple of 7 and leaves a remainder of 3 when divided by 5. What could the number be?
(a) 22 (b) 24 (c) 28 (d) 32

8. Which of the following statements is true about co-prime numbers?
(a) They must both be prime numbers. (b) They have no common factors other than 1.
(c) Their HCF is their product. (d) They must both be odd numbers.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

9. Assertion (A): The number 29 is a prime number.
Reason (R): A prime number is a number that is only divisible by 1 and itself.

10. Assertion (A): The smallest composite number that is even is 4.
Reason (R): A composite number has more than two factors. The factors of 4 are 1, 2, and 4.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the prime factorization of 168.

12. Using the divisibility test for 8, determine if 3456 is divisible by 8. Explain your answer.

13. Find the prime factorization of 840 using the factor tree method.

14. Check if the number 840 is divisible by 8 and 11. Explain your reasoning.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Find all the prime numbers between 80 and 110.

16. What is the smallest 4-digit number that is divisible by both 4 and 10? Explain your method.

17. A number when divided by 4 leaves a remainder of 3. What is the largest such 3-digit number that is a multiple of 5?

SECTION – D

Questions 18 carry 5 marks each.

18. Find the smallest 5-digit number that is a multiple of 15, 20, and 25.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: The School Library

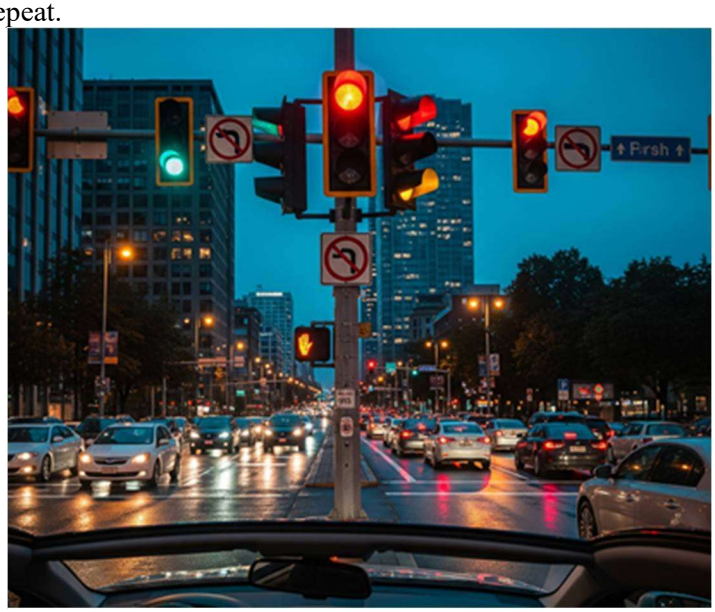
A librarian, Mrs. Sharma, is organizing a new collection of books. She has 210 adventure books and 350 mystery books. She wants to arrange the books on shelves, with each shelf containing the same number of books of a single genre. To use the minimum number of shelves and organize the books most efficiently, she must find the greatest possible number of books that can be placed on each shelf. The solution requires finding the greatest common factor of the two book quantities.



(a) Find the prime factorization of 210.
(b) Find the prime factorization of 350.
(c) Determine the largest number that is a factor of both 210 and 350.
(d) Use the divisibility rule for 10 to show that the largest common number of books per shelf (the answer to part c) is divisible by 10.

20. Case Study 2: The Traffic Lights [redacted]

Three traffic lights at different intersections turn green at different intervals. The first light turns green every 40 seconds, the second every 60 seconds, and the third every 75 seconds. They all just turned green at the same time. A driver wonders when all three lights will turn green simultaneously again. To find this, the driver must calculate the least common multiple of their respective timing intervals. This calculation will reveal the total number of seconds that must pass for the event to repeat.



(a) Find the prime factorization of 40.
(b) Find the prime factorization of 60.
(c) Find the smallest number that is a multiple of 40, 60, and 75.
(d) Based on your answer from (c), after how many minutes will all three lights be green again at the same time?

KRIVAANSH EDUTECH - 8826799505
PRACTICE PAPER 16
CHAPTER 06 PERIMETER AND AREA

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. The length of a rectangle is 150 cm. If its breadth is 1m, then its perimeter is
(a) 7 m (b) 5 m (c) 6 m (d) none of these

2. The side of a square is 8 cm. If its side is doubled, then its new perimeter is
(a) 64 cm (b) 81 cm (c) 121 cm (d) none of these

3. If the sides of a square are halved, then its area
(a) remains same (b) becomes half
(c) becomes one fourth (d) becomes double

4. If the area of a square is 64 cm^2, then its perimeter is
(a) 25 cm (b) 32 cm (c) 15 cm (d) none of these

5. If the area of rectangle increases from 2 cm^2 to 4 cm^2 the perimeter will
(a) increase (b) decrease (c) remains same (d) none of these

6. What is the perimeter of a regular hexagon (6 equal sides) whose side length is 4.5 cm?
(a) 27 cm (b) 22.5 cm (c) 18 cm (d) 36 cm

7. A square wooden board of side 10 cm has a square of side 2 cm cut out from its center. What is the area of the remaining board?
(a) 100 sq cm (b) 4 sq cm (c) 96 sq cm (d) 40 sq cm

8. The sides of a rectangle are in the ratio 5: 4. If its perimeter is 72 cm, then its length is
(a) 40 cm (b) 20 cm (c) 30 cm (d) 60 cm

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason
(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** The area of a 10 m x 10 m square is 4 times the area of a 5 m x 5 m square.
Reason (R): The side length of the larger square is double the side length of the smaller square.

10. **Assertion (A):** The cost of fencing a 10 m x 5 m rectangular plot with one round of wire is calculated using the perimeter of the plot.
Reason (R): The area of the plot determines the quantity of wire needed.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A room is 4 m long and 3 m 50 cm wide. How many square metres of carpet are needed to cover the floor of the room?

12. Two sides of a triangle are 12 cm and 14 cm. The perimeter of the triangle is 36 cm. What is its third side?

13. The lid of a rectangular box, with sides 40 cm by 10 cm, is sealed all around with tape. What is the length of the tape required?

14. A rectangular piece of land measures 0.7 km by 0.5 km. Each side is to be fenced with 4 rows of wires. What is the length of the wire needed?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Five square flower beds, each of sides 1 m, are dug on a piece of land 5 m long and 4 m wide. What is the area of the remaining part of the land?

16. The length and breadth of the three rectangles are as given below:
(a) 9 m and 6 m
(b) 17 m and 3 m
(c) 4 m and 14 m
Which one has the largest area, and which one has the smallest?

17. Sweety runs around a square park of side 75 m. Bulbul runs around a rectangular park with a length of 60 m and a breadth of 45 m. Who covers less distance?

SECTION – D

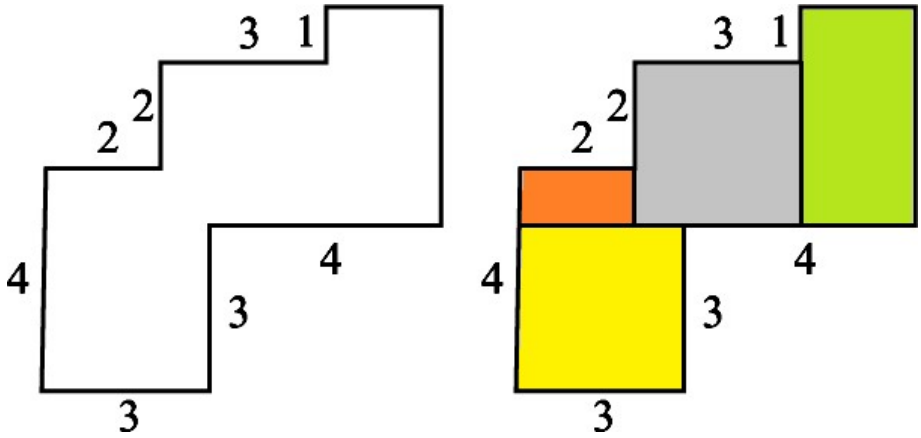
Questions 18 carry 5 marks each.

18. What will happen to the area of rectangle if its
(i) Length and breadth are tripled
(ii) Length is doubled and breadth is same

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1:*
Kiran wants to find the area of the figure using area of rectangle. She splits the figure into four rectangles and then she coloured the four rectangles with yellow, orange, green and grey colour. (The measures are given in centimetres)



Based on the above, answer the following questions

(a) Find the area of orange colour.
(b) Find the area of yellow colour.
(c) Find the area of grey colour.
(d) Find the total area of the figure.

20. Meet Rohan, an avid morning walker! He loves the rectangular park in his neighborhood, which is 50 m long and 30 m wide. To make his workout more accessible, the city decided to build a 2 m wide walking path constructed along the outside of the park's existing boundary. Rohan is eager to see how much larger the total area is now for his exercise route!



(a) Find the area of the entire park (excluding the path). (1 Mark)
(b) Find the new length and breadth of the park including the path. (1 Mark)
(c) Calculate the area of the path only. (2 Marks)

KRIVAANSH EDUTECH- 8826799505
PRACTICE PAPER 17
CHAPTER 06 PERIMETER AND AREA

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

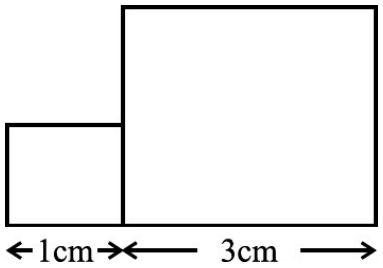
General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

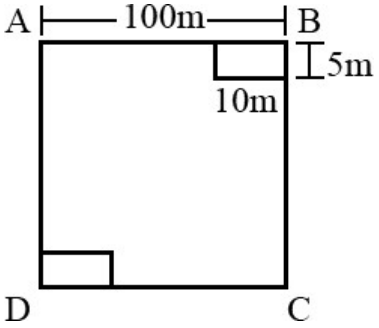
1. In the below figure, a square of side 1 cm is joined to a square of side 3 cm. The perimeter of the new figure is



(a) 13cm (b) 14cm (c) 15cm (d) 16cm

2. The length of a rectangular field is thrice its breadth. If the perimeter of this field is 800m, what is the length of the field?
(a) 100m (b) 140m (c) 200m (d) 300m

3. A square-shaped park ABCD of side 100m has two equal rectangular flower beds, each of size 10m × 5m. Length of the boundary of the remaining park is



(a) 360m (b) 400m (c) 340m (d) 460m

4. The side of a square is 10cm. How many times will the new perimeter become if the side of the square is doubled?
(a) 2 times (b) 4 times (c) 6 times (d) 8 times

5. The cost of fencing a rectangular field 34 m long and 18 m wide at Rs 2.25 per metre is
(a) Rs 243 (b) Rs 234 (c) Rs 240 (d) Rs 334

6. A square piece of paper of side 10 cm is cut into two equal triangular pieces along its diagonal. What is the area of one of the triangular pieces?
(a) 100 sq cm (b) 50 sq cm (c) 25 sq cm (d) 10 sq cm

7. A regular octagon has a perimeter of 168 cm. What is the length of one of its sides?
(a) 21 cm (b) 16.8 cm (c) 28 cm (d) 14 cm

8. If the cost of fencing a rectangular field at Rs. 7.50 per metre is Rs. 600, and the length of the field is 24 m, then the breadth of the field is
(a) 8 m (b) 18 m (c) 24 m (d) 16 m

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason
(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** The area of a rectangle with length 10 cm and breadth 5 cm is 50 sq cm.
Reason (R): The formula for the area of a rectangle is Length x Breadth.

10. **Assertion (A):** The perimeter of a triangle with sides 5 cm, 6 cm, and 7 cm is 18 cm.
Reason (R): The perimeter of any polygon is the sum of the lengths of its sides.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A wire of length 20 m is to be folded in the form of a rectangle. How many rectangles can be formed by folding the wire if the sides are positive integers in metres?

12. The dimensions of a photographs are 30 cm × 20 cm. What length of wooden frame is needed to frame the picture?

13. The area of a rectangle is 49 cm^2 and its breadth is 2.8 cm. Find the length of the rectangle.

14. A rectangle has the area equal to that of a square of side 80 cm. If the breadth of the rectangle is 20 cm, find its length.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Shikha runs around a square of side 75 m. Priya runs around a rectangle with length 60 m and breadth 45 m. Who covers the smaller distance?

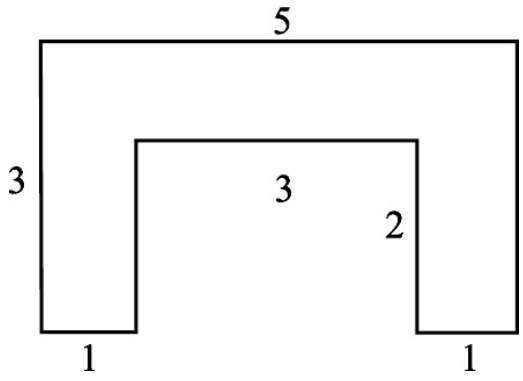
16. To fix fence wires in a garden, 70 m long and 50 m wide, Arvind bought metal pipes for posts. He fixed a post every 5 metres apart. Each post was 2 m long. What is the total length of the pipes he bought for the posts?

17. A marble tile measures 15cm × 20cm. How many tiles will be required to cover a wall of size 4m × 6m?

SECTION – D

Questions 18 carry 5 marks each.

18. The below figure have been split into rectangles. Find their areas. (The measures are given in centimetres)

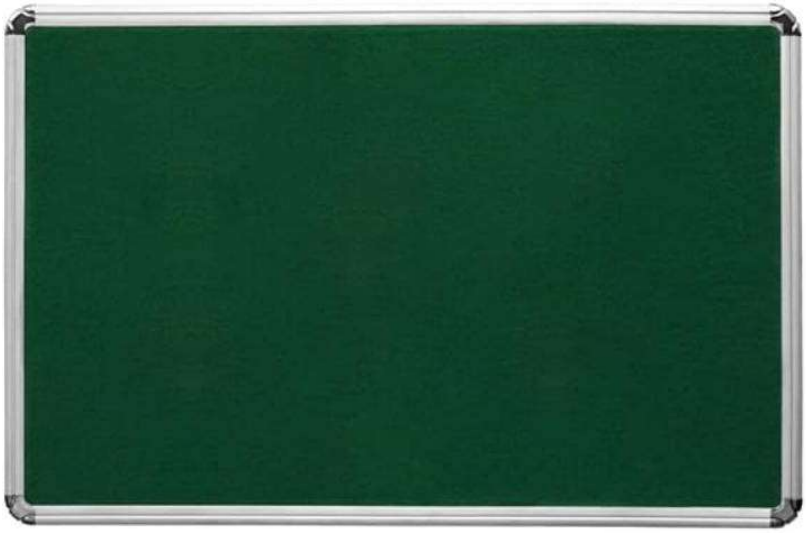


SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

Case Study 1:

The students of Global Reach International School are buzzing with excitement for their annual exhibition! They've chosen the grand exhibition hall to showcase their projects. For this, they have 24 green display boards, each measuring 1 m 50 cm long and 1 m wide. To give a professional finish, a 100 m long aluminium strip has been provided to frame all these boards. The organizing committee needs to figure out if there's enough strip for every single board!



Based on the above, answer the following questions

(a) What is the Perimeter of the one display board? (1)

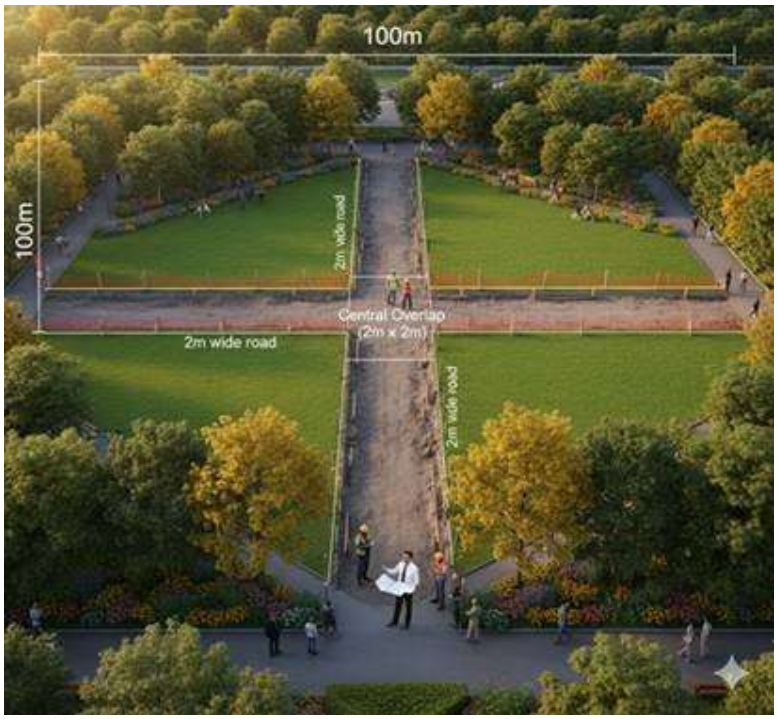
(b) Find the Number of boards will be framed using the available aluminium strip. (1)

(c) Find the Length of the aluminium strip required for the remaining boards. (1)

(d) What is the area of the one display board? (1)

19. *Case Study 2:*

A local council member, Mr. Sharma, proposed building new roads to improve access within the city's 100 x 100 m square central park. They planned two perpendicular, 2 m wide paths right through the middle—one running north-south, and the other east-west. Before starting construction, the project manager needs to precisely calculate the area for the roads and the central intersection to ensure the budget is accurate.



(a) What is the total area of the entire square park? (1 Mark)
(b) What is the area of the road running parallel to the length? (1 Mark)
(c) What is the area of the central square region where the two roads overlap? (1 Mark)
(d) Find the total area covered by the two roads. (1 Mark)

KRIVAANSH EDUTECH- 8826799505

PRACTICE PAPER 18

CHAPTER 06 PERIMETER AND AREA

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. The area of a rectangle is 650 cm^2 and its breadth is 13 cm. The perimeter of the rectangle is
(a) 63 cm (b) 130 cm (c) 100 cm (d) 126 cm

2. The perimeter of a square whose area is 225 m^2 is
(a) 15 m (b) 60 m (c) 225 m (d) 30 m

3. The length and breadth of a rectangle of area A are doubled. The area of the new rectangle is
(a) $2A$ (b) A^2 (c) $4A$ (d) None of these

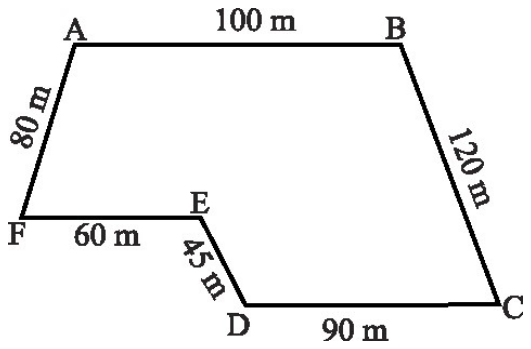
4. The sides of a rectangle are in the ratio 5 : 4. If its perimeter is 72 cm then the length is
(a) 20 cm (b) 30 cm (c) 40 cm (d) none of these

5. A room is 5m 40cm long and 3m 75cm wide. Find the area of the carpet needed to cover the floor.
(a) 20 m^2 (b) 20.25 m^2 (c) 21 m^2 (d) none of these

6. The cost of planting grass is ₹5 per sq m. How much will it cost to plant grass on a rectangular plot 10 m long and 6 m wide?
(a) ₹50 (b) ₹60 (c) ₹300 (d) ₹500

7. A rectangular swimming pool has an area of 300 sq m. If its width is 10 m, what is the perimeter of the pool?
(a) 80 m (b) 60 m (c) 40 m (d) 50 m

8. The perimeter of the below figure is
(a) 490 m (b) 500 m (c) 495 m (d) none of these



In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

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

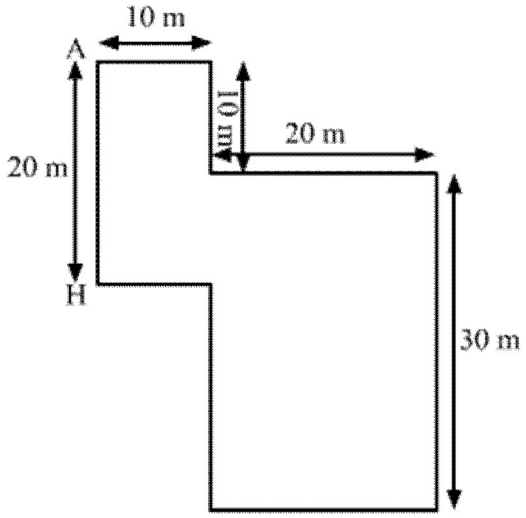
9. **Assertion (A):** The perimeter of a rectangle with length 6 cm and breadth 4 cm is 20 cm.
Reason (R): The formula for the perimeter of a rectangle is 2 x (Length + Breadth).

10. **Assertion (A):** A 2 cm x 2 cm square has a smaller area than a 3 cm x 1 cm rectangle.
Reason (R): The area of the square is 4 sq cm, and the area of the rectangle is 3 sq cm.

SECTION – B

Questions 11 to 14 carry 2 marks each.

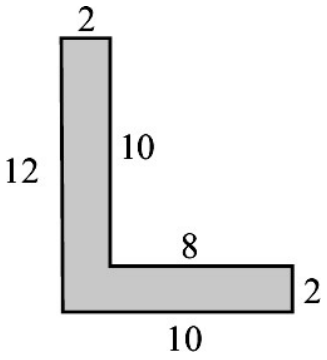
11. Find the perimeter of the following figure:



12. One side of a square plot is 250 m, find the cost of levelling it at the rate of Rs 2 per square metre.

13. If the cost of fencing a rectangular field at Rs. 7.50 per metre is Rs. 600, and the length of the field is 24 m, then find the breadth of the field

14. Split the following shapes into rectangles and find the area of each. (The measures are given in centimetres)



SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A square sheet of side 5 cm is cut out from a rectangular piece of an aluminimum sheet of length 9 cm and breadth 6 cm. What is the area of the aluminium sheet left over?

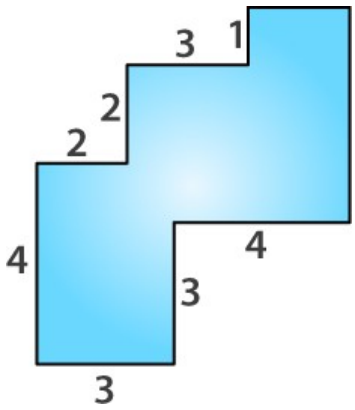
16. If the ratio between the length and the perimeter of a rectangular plot is 1 : 3, then find the ratio between the length and breadth of the plot.

17. A rectangular piece of land measure 0.7 km by 0.5 km. Each side is to be fenced with four rows of wires. What length of the wire is needed?

SECTION – D

Questions 18 carry 5 marks each.

18. By splitting the following figures into rectangles, find their areas (The measures are given in centimetres).



SECTION – E (Case Study Based Questions)

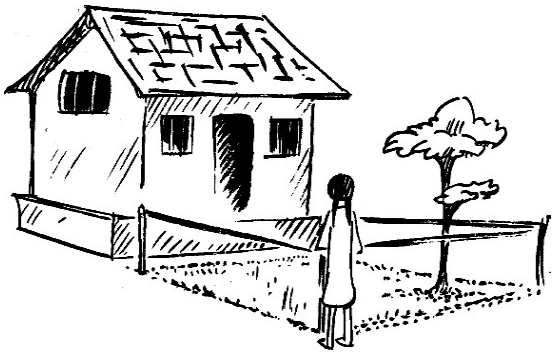
Questions 19 to 20 carry 4 marks each.

19. Case Study 1:

Anu wants to fence the garden in front of her house (see below Figure), on three sides with lengths 20 m, 12 m and 12 m.
For fencing she went to shop to purchase wire. She brought a wire which is in the shape of a square of side 10 m. She changed the shape of the wire into a rectangle of length 12 m.

Based on the above, answer the following questions

(a) Find the cost of fencing at the rate of Rs 150 per metre.



(b) What is the Perimeter of the wire?
(c) What is the breadth of the rectangle she formed?
(d) Find the difference between the Area of the square and the area of the rectangle.

20. Case Study 2:

Maya is renovating her family's grand entrance hall. The floor needs new, elegant marble tiles, each measuring 10 cm × 12 cm. The entire floor area to be covered is a large rectangle measuring 3 m × 4

m. Maya needs to know the exact number of tiles required and the total budget for the tiles, which cost Rs 2 per tile, to ensure the project stays on track.



(a) What is the area of a single marble tile?
(b) What is the area of the wall?
(c) Find the number of tiles required to cover the wall
(c) Find the cost of tiles at the rate of Rs. 2 per tile

KRIVAANSH EDUTECH- 8826799505
PRACTICE PAPER 19
CHAPTER 07 FRACTIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

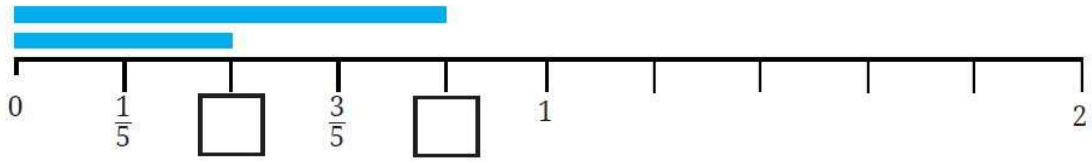
SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A roti is divided among 8 children equally. What fraction does each child get?
(a) 1/6 (b) 1/7 (c) 1/8 (d) 1/5

2. Which of the following represents the fractional unit if a chikki broken into 3 equal parts?
(a) 1/2 (b) 1/3 (c) 1/4 (d) 1/6

3. The number line between 0 and 1 is divided into 5 equal parts shown in below figure. The 2nd mark from 0 represents—



(a) 1/5 (b) 2/5 (c) 3/5 (d) 4/5

4. Which of the following is a mixed number greater than 3?
(a) $2\frac{1}{4}$ (b) $3\frac{1}{6}$ (c) $1\frac{5}{6}$ (d) $2\frac{3}{4}$

5. Equivalent fraction of 3/6 is—
(a) 1/6 (b) 2/6 (c) 1/2 (d) 3/8

6. 4 rotis divided among 6 children gives each child—
(a) 2/3 (b) 3/4 (c) 4/6 (d) 2/6

7. The lowest form of 18/24 is—
(a) 2/3 (b) 3/4 (c) 1/3 (d) 3/8

8. Find 1/4 + 1/2 =
(a) 3/4 (b) 2/4 (c) 5/4 (d) 1/6

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.

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

9. **Assertion (A):** 2/3 is greater than 3/7.
Reason (R): When denominators are different, convert to equivalent fractions with the same denominator.

10. **Assertion (A):** 6/8 and 3/4 are equivalent fractions.
Reason (R): Equivalent fractions always have the same numerator.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Three guavas together weigh 1 kg. Find the weight of each guava.

12. Represent $\frac{-5}{8}$ on a number line.

13. Write 11/4 as a mixed number.

14. Express 40/60 in lowest terms.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Check using equivalent fractions whether 4/6 and 6/9 are equivalent.

16. Add: 2/3 + 5/6 + 1/4

17. Subtract using common denominators: 7/8 – 1/3.

SECTION – D

Questions 18 carry 5 marks each.

18. A paper strip of length 1 unit is folded to make 8 equal parts.
(a) What is the fractional length of one part?
(b) What is 6 times 1/8?
(c) Convert 6/8 into lowest terms.
(d) Show 7/8 on a number line.
(e) Is 6/8 equal to 3/4? Explain.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1:

Radha and her three cousins visited a fair. They bought a large rectangular chikki and decided to share it equally. The shopkeeper cut the chikki into 12 equal parts, similar to the chikki division. Radha ate 3 parts, while each cousin ate 2 parts. After eating, they compared how much each one had eaten and tried converting their shares into fractional units. Radha wanted to know if she ate more than each cousin and if her share could be written in lowest terms. They also wanted to show their shares on a number line.



Based on the above, answer the following questions

(a) Fraction of chikki Radha ate.
(b) Fraction each cousin ate.
(c) Who ate more?
(d) Express Radha's fraction in lowest terms and mark on a number line.

20. *Case Study 2:*

A school canteen prepared fruit juice for 10 students. The flask had 5 glasses of juice. The teacher planned to distribute the juice equally, similar to the "sharing equally" activity. Later, 5 more students joined, and they again shared the same amount of juice equally. The teacher wanted students to compare the two fractions, understand equivalent fractions, and decide which group received more juice per student. They discussed whether increasing the number of children decreases each share.



(a) Fraction of juice per child in first group.
(b) Fraction of juice per child in second group.
(c) Which group gets more?
(d) Explain using equivalent fractions.

KRIVAANSH EDUTECH- 8826799505
PRACTICE PAPER 20
CHAPTER 07 FRACTIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Eight friends shared 2 rotis equally. Each friend gets—
(a) 1/3 (b) 1/4 (c) 1/2 (d) 2/4

2. The strip is divided into 4 equal parts. Each part is—
(a) 1/2 (b) 1/4 (c) 1/8 (d) 1/6

3. On a number line from 0 to 1 divided into 10 equal parts, the 7th mark represents—
(a) 1/10 (b) 3/10 (c) 7/10 (d) 9/10

4. Which fraction is greater?
(a) 5/12 (b) 1/3 (c) 4/15 (d) 2/9

5. Equivalent fraction of 5/10 is—
(a) 2/5 (b) 1/2 (c) 3/10 (d) 5/8

6. Lowest form of 45/60 is—
(a) 3/4 (b) 2/3 (c) 4/5 (d) 5/6

7. Value of 3/4 + 1/8 is—
(a) 5/8 (b) 6/8 (c) 7/8 (d) 8/8

8. Which one is an improper fraction?
(a) 2/5 (b) 1/4 (c) 7/6 (d) 3/8

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Fractions 1/4 and 3/12 are equivalent.
Reason (R): Equivalent fractions represent the same length on a number line.

10. **Assertion (A):** To compare 3/5 and 7/10, we make denominators equal.
Reason (R): Using a common denominator helps compare number of fractional units.

Prepared by: Sareetam Budholiya

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A paper strip of length 1 unit is folded into 6 equal parts. What is the fractional unit? Represent 4 such units.

12. Write 26/8 as a mixed number.

13. Add: 1/3 + 2/9 using equivalent fractions.

14. Reduce 84/108 to simplest form.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Show whether 6/8 and 9/12 are equivalent fractions.

16. Add 3/5 + 2/3 + 7/15.

17. Subtract: 5/6 – 2/9 using common denominator method.

SECTION – D

Questions 18 carry 5 marks each.

18. A number line from 0 to 2 is divided into 12 equal parts.
(a) What is the size of one part?
(b) Mark 5/12 on number line.
(c) Express 15/12 as mixed number.
(d) Are 5/12 and 10/24 equivalent? Prove.
(e) Is 15/12 > 11/12? Why?

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1:

A farmer divides 3 identical sugarcane juice bottles equally among his 4 children. Each child drinks his share, and later the children compare how much they drank using fractional units. The youngest child wants to convert the fraction into simplest form, while the eldest wants to know how to represent it on a number line. They also check whether the fractional unit is 1/3 or 1/4 and discuss their reasoning using examples from the textbook.



Based on the above, answer the following questions

(a) Fraction per child?
(b) Write its one equivalent fraction.
(c) Represent on number line.
(d) Is 3/4 greater than 1? Explain.

20. *Case Study 2:*

A class prepares a fruit salad using 5 rotis of sweet bread cut into equal pieces. The teacher divides all pieces equally among 15 students. Later, 5 more students join, and the teacher redistributes the same amount of pieces. Students compare both situations, find equivalent fractions, and reason which group got a larger share. They connect this with the rule "more children → smaller share,"



Based on the above, answer the following questions

(a) Fraction of juice per child in first group.
(b) Fraction of juice per child in second group.
(c) Which group gets more?
(d) Explain using equivalent fractions.

KRIVAANSH EDUTECH- 8826799505
PRACTICE PAPER 21
CHAPTER 07 FRACTIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. 1 roti shared equally among 3 children gives—
(a) 1/2 (b) 1/3 (c) ¼ (d) 1/6

2. A strip divided into 8 equal parts. Each part is—
(a) 1/4 (b) 1/6 (c) 1/8 (d) 1/12

3. Which point lies between 3/8 and 5/8 on a number line?
(a) 4/8 (b) 2/8 (c) 6/8 (d) 1/8

4. Mixed form of 35/6 is—
(a) $5\frac{5}{6}$ (b) $4\frac{1}{6}$ (c) $3\frac{2}{3}$ (d) $2\frac{5}{6}$

5. Simplest form of 30/45 is—
(a) 2/3 (b) ¾ (c) ½ (d) 3/5

6. Equivalent fraction of 2/7 is—
(a) 3/7 (b) 4/14 (c) 2/9 (d) 3/21

7. 1/6 + 1/3 =
(a) 2/6 (b) 3/6 (c) 4/6 (d) 5/6

8. 7/10 – 1/5 =
(a) 3/10 (b) 4/10 (c) 1/10 (d) 5/10

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. Assertion (A): 3/9 = 1/3.
Reason (R): Dividing numerator and denominator by same non-zero number keeps the value same.

10. Assertion (A): 4/5 is greater than 7/10.
Reason (R): Fractions with smaller denominators are always larger.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Represent 2/7 on a number line.

12. Convert 17/3 into a mixed fraction.

13. Add: 3/8 + 1/4

14. Reduce 96/120 to simplest form.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Check if 4/10 and 6/15 are equivalent.

16. Add: 4/9 + 5/12 + 1/6

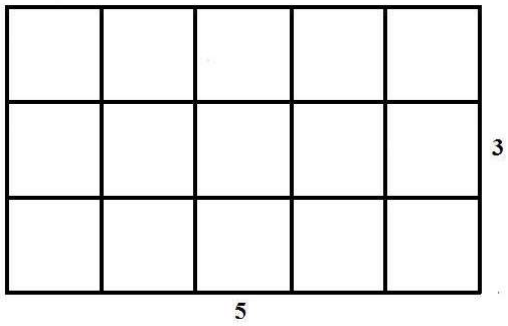
17. Subtract: 11/12 – 5/18

SECTION – D

Questions 18 carry 5 marks each.

18. A rectangle is divided into 15 equal squares.

(a) What is the fractional unit?
(b) Shade 9 squares; write fraction.
(c) Write in simplest form.
(d) Mark simplest form on number line.
(e) Is 9/15 equal to 3/5? Justify.



SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1:

A group of students prepared a poster on "Ancient Indian Fractions". They divided a large chart into equal parts and allocated work proportionately. One student completed 5 parts out of 12, while another completed 7 parts. They compared their contributions, checked for equivalent fractions, and tried converting both to lowest terms. They also checked whether the total work exceeded the full chart or not.



Based on the above, answer the following questions

(a) Fraction of work by student A.
(b) Fraction by student B.
(c) Who worked more?
(d) Write one equivalent fraction of both.

20. *Case Study 2:*

A fruit vendor divides 4 kg oranges into equal packets of fractional weights. Later, he mixes the packets and sells 3/4 kg and 5/6 kg to two customers. The customers discuss their purchases using mixed fractions, equivalent fractions, and compare their quantities. They want to identify who purchased more and by how much.



Based on the above, answer the following questions

(a) Convert 5/6 into equivalent fraction with denominator 12.
(b) Convert 3/4 with denominator 12.
(c) Who purchased more?
(d) By how much?

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PRACTICE PAPER 22
CHAPTER 08 PLAYING WITH CONSTRUCTIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. After drawing one side of a square, which construction is done next?
(a) Draw diagonals (b) Draw a perpendicular at one end
(c) Measure area (d) Join endpoints freehand

2. While copying a line segment, the compass opening changes. What should be done?
(a) Continue drawing (b) Redraw arc only
(c) Fix compass opening and restart (d) Draw freehand

3. If equal sides are drawn but angles are not right angles, which figure results?
(a) Square (b) Rectangle (c) Irregular quadrilateral (d) Triangle

4. To divide a rectangle into equal squares, which construction must be repeated?
(a) Drawing diagonals (b) Drawing perpendiculars at equal intervals
(c) Drawing circles (d) Measuring area

5. To locate the centre of a square for drawing a circle inside it, which construction is used?
(a) Drawing sides (b) Drawing perpendiculars
(c) Drawing diagonals (d) Measuring lengths

6. If a perpendicular drawn during rectangle construction is slanted, what should be done?
(a) Extend the side (b) Redraw the perpendicular correctly
(c) Draw diagonals (d) Measure one side

7. Which construction step ensures all angles of a rectangle are right angles?
(a) Drawing equal sides (b) Drawing perpendiculars
(c) Drawing diagonals (d) Measuring area

8. To divide a rectangle into three equal squares, which action is required?
(a) Draw diagonals (b) Mark equal lengths and draw perpendiculars
(c) Draw circles (d) Shade the figure

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Diagonals are drawn in a square to locate its centre.
   Reason (R): The intersection point of diagonals is equidistant from all vertices.

10. **Assertion (A):** While constructing adjacent squares, the compass opening must remain unchanged.
    Reason (R): Changing the compass opening will produce unequal squares.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Construct a square when one side is given as 6 cm.

12. A robot draws AB and perpendicular at A but cuts unequal length. Identify mistake and correction.

13. Write the steps to extend one square into a strip of squares.

14. Write the steps to verify a constructed square.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Construct a rectangle when its length is 6 cm and breadth is 4 cm given.

16. Construct a square and divide it into four equal smaller squares.

17. Construct a square and draw a circle inside it.

SECTION – D

Questions 18 carry 5 marks each.

18. Construct a rectangle 8cm by 4cm and divide it into equal squares.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1:*

A school stage is to be built in the shape of a square. One side is drawn first. Perpendiculars are constructed at both ends, and equal lengths are marked to complete the square. Diagonals are drawn to locate the centre, where a circular design is added using a compass.



Based on the above, answer the following questions

(a) What construction is done after drawing the first side?
(b) How are equal sides ensured?
(c) Which construction locates the centre?
(d) What action is taken before drawing the circle?

20. *Case Study 2:*

A classroom floor is rectangular. To tile it with equal square tiles, workers mark equal lengths along one side, draw perpendiculars at each mark, and extend lines across the rectangle. They check alignment and repeat the process until the floor is completely tiled.



Based on the above, answer the following questions

(a) What is done after marking equal lengths?
(b) How are right angles maintained?
(c) How is the square pattern extended?
(d) What check ensures accurate square formation?

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PRACTICE PAPER 23

CHAPTER 08 PLAYING WITH CONSTRUCTIONS

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. While constructing a rectangle, after drawing one side, which is the correct next step?
(a) Draw diagonals (b) Draw a perpendicular at one end
(c) Measure area (d) Join endpoints freehand

2. To copy a given line segment accurately, what must remain unchanged?
(a) Ruler position (b) Compass opening
(c) Paper direction (d) Pencil angle

3. If a student draws perpendiculars at both ends but cuts unequal lengths, which figure is formed?
(a) Square (b) Rectangle (c) Irregular quadrilateral (d) Triangle

4. To divide a rectangle into equal squares, what is done after completing the rectangle?
(a) Draw diagonals (b) Mark equal lengths and draw perpendiculars
(c) Draw circles (d) Shade the figure

5. To draw a circle inside a square, which construction identifies the centre?
(a) Drawing sides (b) Drawing perpendiculars
(c) Drawing diagonals (d) Measuring lengths

6. If the perpendicular drawn while constructing a square is slanted, what should be done?
(a) Extend the side (b) Redraw the perpendicular correctly
(c) Draw diagonals (d) Measure one side

7. Which construction step ensures right angles in a rectangle?
(a) Drawing equal sides (b) Drawing perpendiculars
(c) Drawing diagonals (d) Measuring area

8. To extend one square into three equal squares in a row, what must be repeated?
(a) Drawing diagonals (b) Marking equal lengths and drawing perpendiculars
(c) Drawing circles (d) Shading the squares

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Diagonals are drawn in a square to locate its centre.
Reason (R): The intersection point of diagonals is equidistant from all vertices.

10. **Assertion (A):** While extending a strip of squares, the compass opening must remain unchanged.
Reason (R): Changing the compass opening will produce unequal squares.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Construct a square when one side is given as 8 cm.

12. Write the steps of Constructions to construct a line segment AB of length 6 cm and copy it using compass.

13. Write the steps of Constructions to construct perpendicular line at point A on line segment AB.

14. Write the steps to verify a constructed rectangle.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Construct a square, divide it into four equal smaller squares and then construct four circles inside each square.

16. Construct a rectangle where one of its sides is 5 cm and the length of a diagonal is 7 cm.

17. Construct a rectangle when its length is 8 cm and breadth is 4 cm given.

SECTION – D

Questions 18 carry 5 marks each.

18. Construct a rectangle 8cm by 2cm and divide it into equal squares.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1:

Riya is designing a square garden using tiles. She constructs a square using compass and ruler so that all tiles are equal. She starts by drawing one side and then constructs perpendicular lines at both ends. Using compass, she marks equal lengths and completes the square. Later, she divides the garden into four equal square sections using perpendicular lines through the center. This helps her plant different flowers in each section equally. Proper compass use ensures accurate construction.



Based on the above, answer the following questions

(a) Which instrument ensures equal sides?
(b) Why perpendicular lines are necessary?
(c) What shape is formed?
(d) How many smaller squares formed?

20. Case Study 2:

A carpenter constructs rectangular floor using ruler and compass. He first draws the length and constructs perpendicular lines at both ends. Then he marks breadth and completes rectangle. To check accuracy, he measures opposite sides and angles. He confirms all angles are right angles and opposite sides equal. This ensures correct rectangular shape. Compass ensures accurate measurement and perpendicular construction helps form correct shape.



Based on the above, answer the following questions

(a) What shape formed?
(b) How many right angles present?
(c) Which instrument ensures equal lengths?
(d) Which construction ensures right angle?

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PRACTICE PAPER 24

CHAPTER 09 SYMMETRY

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A regular polygon has an order of rotational symmetry of 8. What is the smallest angle of rotation?
(a) 30° (b) 36° (c) 40° (d) 45°

2. A rectangle is folded along its vertical centre line. Which statement is correct?
(a) Two unequal parts (b) Two mirror halves
(c) Only rotational symmetry (d) No symmetry

3. A figure overlaps itself **6 times** in one full rotation. Which figure is it?
(a) Equilateral triangle (b) Regular hexagon
(c) Square (d) Rectangle

4. Which figure has **rotational symmetry but no reflection symmetry**?
(a) Windmill (b) Square
(c) Equilateral triangle (d) Regular hexagon

5. If a regular decagon has 10 lines of symmetry, what is its smallest angle of rotation?
(a) 30° (b) 36° (c) 40° (d) 45°

6. Which shape has **exactly one line of symmetry**?
(a) Isosceles triangle (b) Square
(c) Equilateral triangle (d) Regular hexagon

7. A regular polygon has smallest angle of rotation equal to 72°. How many sides does it have?
(a) 5 (b) 6 (c) 8 (d) 10

8. Which rotation always maps any figure onto itself?
(a) 120° (b) 180° (c) 270° (d) 360°

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** A scalene triangle has no line of symmetry.
Reason (R): All sides and angles are unequal.

10. Assertion (A): A square has four lines of symmetry.
Reason (R): Folding along any diagonal or centre line produces two mirror halves.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. (a) Write the number of lines of symmetry of a regular hexagon.
(b) Write one such line.

12. (a) Write the order of rotational symmetry of a square.
(b) Write its smallest angle of rotation.

13. (a) Write the order of rotational symmetry of an equilateral triangle.
(b) Write its smallest angle of rotation.

14. (a) Write the number of lines of symmetry of a rectangle.
(b) Write its order of rotational symmetry.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A regular octagon is drawn.
(a) Write its number of sides
(b) Write its number of lines of symmetry
(c) Write its smallest angle of rotation

16. A square sheet is folded along both diagonals.
(a) Write number of folds
(b) Write number of equal regions formed
(c) Write number of mirror images of a punched hole

17. A ceiling fan has eight identical blades.
(a) Write the centre of rotation
(b) Write the order of rotational symmetry
(c) Write the smallest angle of rotation

SECTION – D

Questions 18 carry 5 marks each.

18. A regular polygon has 10 equal sides.
(a) Write its name
(b) Write number of lines of symmetry
(c) Write order of rotational symmetry
(d) Write smallest angle of rotation
(e) Write one real-life object showing similar symmetry

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1: School Hall Floor Design*

Students create a floor design in the shape of a regular hexagon. Each side is equal and angles identical. Rotating the hexagon about its centre, it matches itself six times in one full rotation. Folding along axes through the centre produces identical mirror halves. The design appears balanced and visually

appealing. Teachers explain that symmetry in rotation and reflection makes the design attractive and helps students recognize symmetry in real-life objects.



Based on the above, answer the following questions

(a) Write the number of sides of the hexagon
(b) Write the order of rotational symmetry
(c) Write the smallest angle of rotation
(d) Write the number of lines of symmetry

20. *Case Study 2:*

A decorative garden pinwheel has twelve identical blades fixed around a central point. When wind blows, it rotates smoothly. After each equal turn, the pinwheel looks exactly the same. Folding along any line does not produce mirror halves. Students count the number of times it repeats in one full rotation. The pinwheel demonstrates rotational symmetry in real-life objects.



Based on the above, answer the following questions

(a) Write the type of symmetry
(b) Write the order of rotational symmetry
(c) Write the smallest angle of rotation
(d) Write whether it has any line of symmetry

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PRACTICE PAPER 25

CHAPTER 09 SYMMETRY

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A square tile is rotated about its center. After which smallest rotation does it look unchanged?
(a) 30° (b) 60° (c) 90° (d) 180°

2. A regular pentagon is folded along one line passing through a vertex and center. The halves overlap exactly. Number of such lines possible is:
(a) 3 (b) 4 (c) 5 (d) 6

3. A shape matches itself after 180° rotation only. Its order of rotational symmetry is:
(a) 1 (b) 2 (c) 3 (d) 4

4. A regular hexagon is rotated through 120°. It:
(a) does not match (b) partially matches
(c) matches completely (d) changes size

5. Which shape has exactly one line of symmetry?
(a) Circle (b) Rectangle (c) Square (d) Isosceles triangle

6. A regular octagon has rotational symmetry order:
(a) 4 (b) 6 (c) 8 (d) 10

7. A regular decagon is rotated by 36°. The shape:
(a) matches (b) does not match (c) becomes circle (d) becomes square

8. A shape has order 5 rotational symmetry. Number of times it matches in one full turn is:
(a) 2 (b) 3 (c) 4 (d) 5

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** A circle has rotational symmetry of infinite order.
Reason (R): Circle matches after any angle rotation.

10. Assertion (A): A rectangle has rotational symmetry of order 2.
Reason (R): Rectangle matches after 180° rotation.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. (a) Find smallest angle of rotational symmetry of regular octagon.
(b) Find its order.

12. (a) Find number of symmetry lines in regular decagon.
(b) Find order of rotational symmetry.

13. (a) A shape matches after 120° rotation. Find order.
(b) Total matches in full turn.

14. (a) Find order of square symmetry.
(b) Find smallest rotation angle.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. (a) Find smallest rotation angle of regular pentagon.
(b) Find order.
(c) Total matches in full turn.

16. (a) Find symmetry lines in square.
(b) Find rotational symmetry order.
(c) Find smallest angle.

17. (a) Find rotational order of regular hexagon.
(b) Find smallest angle.
(c) Find matches.

SECTION – D

Questions 18 carry 5 marks each.

18. A regular octagon is rotated step-by-step.
(a) Find order of symmetry
(b) Find smallest angle
(c) Find matches in full rotation
(d) Find angle after 3 matches
(e) Find angle after 5 matches

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1: School Hall Floor Design*

In a school corridor, decorative tiles shaped like regular hexagons are used to create attractive wall patterns. Each tile is carefully rotated while placing so that the design appears uniform from all viewing angles. Students observe that when the tile is rotated step-by-step, it matches itself multiple times before completing one full turn. The art teacher explains that this matching property is due to rotational symmetry. Students measure angles of rotation and count how many times the tile appears identical during one full rotation. This activity helps them connect mathematics with real-life artistic design and understand symmetry clearly.



Based on the above, answer the following questions

(a) Find the Number of symmetry order
(b) Find the Smallest rotation angle
(c) Find the Number of matches
(d) Find whether it Matches after 180°

20. *Case Study 2:*

A school designs its logo in the shape of a regular pentagon with identical sides and angles. The logo is printed on badges, notebooks, and uniforms. When students rotate the badge slowly around its center, they notice the logo matches itself several times before completing one full turn. They carefully observe and count matching positions and calculate the rotation angle needed for matching. Their mathematics teacher explains that regular polygons show rotational symmetry and that the number of matching positions depends on number of sides. Students enjoy learning this concept through the real example of their school identity.



Based on the above, answer the following questions

(a) Find the Order of symmetry
(b) Find the Smallest angle
(c) Find whether it Matches after 144°
(d) Find the number of Matches in 360°

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PRACTICE PAPER 26

CHAPTER 09 SYMMETRY

SUBJECT: MATHEMATICS | MAX. MARKS : 40

CLASS : VI | **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A regular triangle is rotated about its center. After how many degrees of rotation does it first look exactly the same as its original position?
(a) 60° (b) 90° (c) 120° (d) 180°

2. A regular polygon matches itself exactly 8 times during one full rotation. How many sides does the polygon have?
(a) 6 (b) 7 (c) 8 (d) 9

3. A regular polygon has the smallest rotational symmetry angle equal to 40°. How many sides does the polygon have?
(a) 7 (b) 8 (c) 9 (d) 10

4. A square is rotated by 270°. Why does it exactly match its original position?
(a) 270° is greater than 180°
(b) 270° is a multiple of its 90° angle of rotation
(c) A square has 4 equal sides
(d) 270° is a full rotation

5. Which regular polygon has the smallest rotational symmetry angle equal to 45°?
(a) Pentagon (b) Hexagon (c) Octagon (d) Decagon

6. Which regular polygon matches itself after a rotation of 72°?
(a) Square b) Pentagon (c) Hexagon (d) Octagon

7. When a regular hexagon is rotated by 300°, what will happen?
(a) It will not match (b) It will partially match
(c) It will match exactly (d) Its size will change

8. Which of the following shapes has the highest order of rotational symmetry?
(a) Triangle (b) Square (c) Pentagon (d) Circle

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Regular polygons always have rotational symmetry.
Reason (R): All sides and all angles of a regular polygon are equal.

10. Assertion (A): The order of rotational symmetry of a regular decagon is 10.
Reason (R): A regular decagon has 10 equal sides.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A regular polygon has 6 equal sides.
(a) What is the order of rotational symmetry of the polygon?
(b) What is the smallest angle of rotation for which it matches itself?

12. A regular polygon has 10 equal sides.
(a) What is the order of rotational symmetry of the polygon?
(b) What is the smallest angle of rotation for which it matches itself?

13. A regular polygon has the smallest rotational symmetry angle equal to 90°.
(a) What is the order of rotational symmetry of the polygon?
(b) Identify the name of the polygon.

14. A regular polygon has rotational symmetry of order 3.
(a) What is the smallest angle of rotation?
(b) Identify the name of the polygon.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A regular decagon is rotated about its center.
(a) What is the order of rotational symmetry of the decagon?
(b) What is the smallest angle of rotation?
(c) Will the decagon match its original position after a rotation of 180°? Justify your answer.

16. A regular octagon is rotated step by step.
(a) What is the order of rotational symmetry?
(b) What will be the angle of rotation after 4 matching positions?
(c) Will the octagon match its original position after this rotation?

17. A regular pentagon is rotated about its center.
(a) What is the smallest angle of rotation?
(b) Will it match after a rotation of 216°?
(c) What is the order of rotational symmetry?

SECTION – D

Questions 18 carry 5 marks each.

18. A regular hexagon is rotated continuously about its center.
(a) What is the order of rotational symmetry of the hexagon?
(b) What is the smallest angle of rotation?
(c) Will it match after a rotation of 120°? Justify.
(d) Will it match after a rotation of 240°? Justify.
(e) How many times will it match itself during one complete rotation?

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1: School Hall Floor Design*

In a modern school playground, decorative tiles shaped like regular octagons are arranged around a circular sitting area. Students observe these tiles while sitting and notice that the shape looks exactly

the same after certain rotations. One student brings a paper model of the tile and rotates it slowly about its center. The student marks positions where the tile matches its original shape and measures the angle between these positions using a protractor. The teacher explains that this matching occurs due to rotational symmetry. Students learn that the number of matching positions depends on the number of sides of the regular polygon used.



Based on the above, answer the following questions

(a) What is the order of rotational symmetry of the regular octagon tile?
(b) What is the smallest angle of rotation for which the tile matches itself?
(c) Will the tile match its original position after a rotation of 135°? Show the calculation.
(d) How many times will the tile match itself during one complete rotation of 360°?

20. *Case Study 2:*

During the annual cultural festival, students design decorative badges shaped like regular equilateral triangles. These badges are attached to their uniforms. Curious about symmetry, students rotate a paper badge about its center and observe matching positions. They carefully mark each matching position and measure the angles between them using a protractor. They notice equal angle intervals between matches. The mathematics teacher explains that regular polygons show rotational symmetry and that the number of matches equals the number of sides. Students realize how symmetry helps designers create balanced logos, decorations, and artistic patterns used in school festivals and real-life creative designs everywhere.



Based on the above, answer the following questions

(a) What is the order of rotational symmetry of the equilateral triangle badge?
(b) What is the smallest angle of rotation for which the badge matches itself?
(c) Will the badge match its original position after a rotation of 240°? Show the calculation.
(d) How many times will the badge match itself during one full rotation of 360°?

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PRACTICE PAPER 27

CHAPTER 09 SYMMETRY

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A regular polygon overlaps itself **4 times** in one full rotation. Which polygon is it?
(a) Equilateral triangle (b) Square (c) Regular pentagon (d) Rectangle

2. A rectangle is folded along its vertical centre line. What is observed?
(a) Two unequal parts (b) Two mirror halves
(c) Only rotational symmetry (d) No symmetry

3. A regular hexagon rotated about its centre matches itself six times. What is the smallest angle of rotation?
(a) 30° (b) 45° (c) 60° (d) 90°

4. Which figure has **rotational symmetry but no reflection symmetry**?
(a) Windmill (b) Square (c) Equilateral triangle (d) Regular hexagon

5. A regular pentagon has an order of rotational symmetry of 5. What is the smallest angle of rotation?
(a) 60° (b) 72° (c) 90° (d) 120°

6. Which shape has **exactly one line of symmetry**?
(a) Isosceles triangle (b) Square (c) Equilateral triangle (d) Regular hexagon

7. A regular polygon has a smallest angle of rotation 36°. How many sides does it have?
(a) 5 (b) 6 (c) 10 (d) 12

8. Which rotation always maps any figure onto itself?
(a) 120° (b) 180° (c) 270° (d) 360°

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** A square has four lines of symmetry.
Reason (R): Folding along diagonal or central lines produces mirror halves.

10. Assertion (A): A scalene triangle has no line of symmetry.
Reason (R): All sides and angles are unequal.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. (a) Write the number of lines of symmetry of a regular hexagon.
(b) Write one such line.

12. (a) Write the order of rotational symmetry of a square.
(b) Write its smallest angle of rotation.

13. (a) Write the order of rotational symmetry of an equilateral triangle.
(b) Write its smallest angle of rotation.

14. (a) Write the number of lines of symmetry of a rectangle.
(b) Write its order of rotational symmetry.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A regular octagon is drawn.
(a) Write its number of sides
(b) Write its number of lines of symmetry
(c) Write its smallest angle of rotation

16. A square sheet is folded along both diagonals.
(a) Write number of folds
(b) Write number of equal regions formed
(c) Write number of mirror images of a punched hole

17. A ceiling fan has three identical blades.
(a) Write the centre of rotation
(b) Write order of rotational symmetry
(c) Write the smallest angle of rotation

SECTION – D

Questions 18 carry 5 marks each.

18. A regular polygon has 8 equal sides.
(a) Write its name
(b) Write number of lines of symmetry
(c) Write order of rotational symmetry
(d) Write smallest angle of rotation
(e) Write one real-life object showing similar symmetry

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1: School Hall Floor Design*

During a school celebration, students create a floor design in the shape of a regular decagon. Each side and angle is equal. Rotating the decagon about its centre, it matches itself ten times. Folding along axes through the centre produces identical mirror halves. Teachers explain that symmetry makes the design visually balanced and attractive. Students count the overlapping rotations and symmetry lines to understand geometry in real-life objects.



Based on the above, answer the following questions

(a) Write the number of sides of the decagon
(b) Write the order of rotational symmetry
(c) Write the smallest angle of rotation
(d) Write the number of lines of symmetry

20. *Case Study 2:*

A decorative windmill in a garden has twelve identical blades. When air blows, it rotates smoothly. Students observe that after each equal turn, the windmill looks the same. Folding along any line does not produce mirror halves. They count how many times the pattern repeats in one full rotation. The windmill demonstrates rotational symmetry in everyday objects and is visually attractive.



Based on the above, answer the following questions

(a) Write the type of symmetry
(b) Write the order of rotational symmetry
(c) Write the smallest angle of rotation
(d) Write whether it has any line of symmetry

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PRACTICE PAPER 28

CHAPTER 10 THE OTHER SIDE OF ZERO

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. From –11, what is the **least positive move** to reach +1?
(a) +10 (b) +11 (c) +12 (d) +13

2. Which integer x satisfies: x – 5 = –9 ?
(a) –15 (b) –14 (c) –4 (d) –3

3. Complete: □ + (–18) = –7
(a) +11 (b) +10 (c) +9 (d) +8

4. Why is –5 greater than –22?
(a) –5 is positive (b) –5 lies closer to zero
(c) –22 has no inverse (d) –22 lies right of –5

5. Start at 0. Apply –14, +9, +6. Final integer is:
(a) –1 (b) +1 (c) –3 (d) +3

6. Which integer is **farthest from zero**?
(a) –16 (b) +12 (c) –9 (d) +14

7. Which expression equals **+6**?
(a) –4 + 10 (b) +8 – 3 (c) –12 + 6 (d) +9 – 1

8. Which statement is correct?
(a) –25 > –19 (b) –7 < –15 (c) –6 > –21 (d) –10 = –12

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** The sum of an integer and its additive inverse is zero.
Reason (R): Every integer has exactly one additive inverse.

10. Assertion (A): (–3) – (+7) = –10
Reason (R): Subtracting a positive integer decreases the value.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. (a) Write the additive inverse of –108
(b) Find their sum

12. (a) Starting integer = –19, final integer = +4
(b) Find the total movement

13. (a) Which is greater: –73 or –61?
(b) Give one valid reason

14. (a) Final integer = –6, starting integer = +9
(b) Find the operation performed

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. (a) Evaluate: –57 + 34
(b) Explain using number-line movement
(c) State the sign of the result

16. (a) Rewrite as addition: +16 – (+41)
(b) Solve
(c) Interpret the result

17. (a) Arrange: –21, +38, –64 in increasing order
(b) Find the integer Nearest to zero
(c) Find the integer Farthest from zero

SECTION – D

Questions 18 carry 5 marks each.

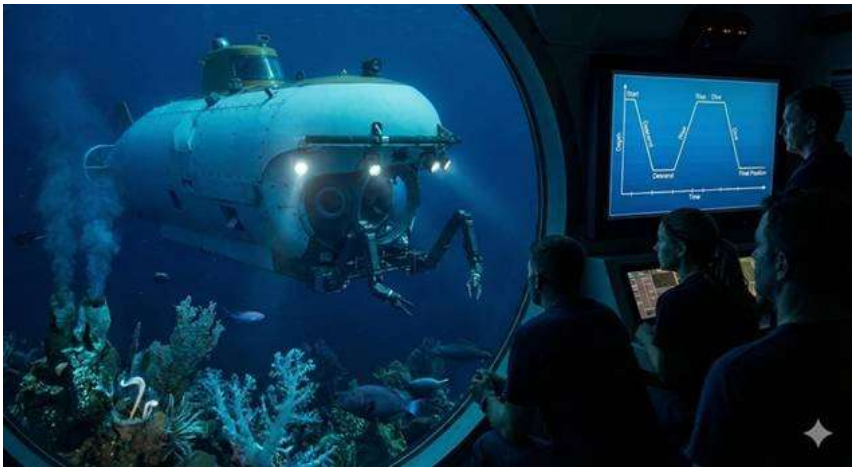
18. A survey drone is 12 units above reference level. It descends 27 units, rises 14 units, descends 6 units, and rises 5 units.
(a) Write the integer expression
(b) Simplify stepwise
(c) Find the Final position
(d) Find the Net vertical movement
(e) Find the Position relative to reference level

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1:*

A research submarine is exploring the deep sea. At the beginning of the day, it is at a depth of 35 metres below sea level. During the first exploration, it descends 18 metres. Later, it rises 22 metres to study marine life. After that, it again dives 15 metres to reach a deeper trench. Finally, the submarine rises 10 metres before ending its mission. The crew wants to calculate the final position of the submarine relative to sea level and understand how its depth changed after each movement. Use integer operations to find the correct answers to the following questions.



Based on the above, answer the following questions

(a) Write the integer expression for the submarine's movement.
(b) Find the depth after the first two movements.
(c) Find the depth after the third movement.
(d) Find the final depth of the submarine.

20. *Case Study 2:*

In a hill station town, the temperature early morning was 12°C below zero. By noon, the temperature increased by 15°C due to sunshine. In the afternoon, cold winds caused the temperature to fall by 9°C. Later in the evening, the temperature rose by 6°C as the clouds cleared. At night, the temperature again dropped by 8°C. The weather department wants to calculate the temperature at different times of the day and finally determine the temperature at night using integer operations.



Based on the above, answer the following questions

(a) Write the integer expression representing the temperature changes.
(b) Find the temperature by noon.
(c) Find the temperature in the evening.
(d) Find the final temperature at night.

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PRACTICE PAPER 29

CHAPTER 10 THE OTHER SIDE OF ZERO

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Starting from –8, which **single move** will place you at +3?
(a) +9 (b) +10 (c) +11 (d) +12

2. Which integer lies **strictly between –6 and +1**?
(a) –7 (b) –5 (c) +1 (d) +3

3. Complete the balance: –13 + □ = –4
(a) +7 (b) +8 (c) +9 (d) +10

4. Why is –6 greater than –15?
(a) –6 is positive (b) –6 is closer to zero
(c) –15 has no inverse (d) –15 lies right of –6

5. Start at 0. Apply –11, +18, –9. The final integer is:
(a) –2 (b) +2 (c) –4 (d) +4

6. Which integer has the **maximum distance from zero**?
(a) –9 (b) +12 (c) –14 (d) +10

7. Which expression gives the value **–8**?
(a) –3 – 5 (b) +6 – 12 (c) –10 + 4 (d) +6 – 18

8. Which statement is correct?
(a) –19 > –7 (b) –4 < –11 (c) –6 > –13 (d) –9 = –3

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Adding zero to an integer does not change its value.
Reason (R): Zero is the additive identity for integers.

10. Assertion (A): (–11) – (+4) = –15
Reason (R): Subtracting a positive integer moves left on the number line.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. (a) Write the additive inverse of +96
(b) Find their sum

12. (a) Starting integer = –21, final integer = +5
(b) Find the total movement

13. (a) Which is greater: –68 or –54?
(b) Give one valid reason

14. (a) Final integer = –10, starting integer = +8
(b) Find the operation performed

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. (a) Evaluate: –52 + 29
(b) Explain using number-line movement
(c) State the sign of the result

16. (a) Rewrite as addition: +14 – (+37)
(b) Solve
(c) Interpret the result

17. (a) Arrange: –17, +34, –61 in increasing order
(b) Find the integer Nearest to zero
(c) Find the integer Farthest from zero

SECTION – D

Questions 18 carry 5 marks each.

18. A research drone is initially 10 units above reference level. It descends 24 units, rises 15 units, descends 7 units, and rises 4 units.
(a) Write the integer expression
(b) Simplify stepwise
(c) Find the Final position
(d) Find the Net vertical movement
(e) Find the Position relative to reference level

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1:*

During an earthquake study, scientists measure changes in land elevation using integers, where zero represents the original ground level. After the first tremor, the land subsides by 16 units. Later, tectonic adjustment raises the land by 23 units. A minor aftershock then causes the land to sink by 4 units. Positive integers represent upward movement, while negative integers represent downward movement. Using integer operations, answer the following questions.

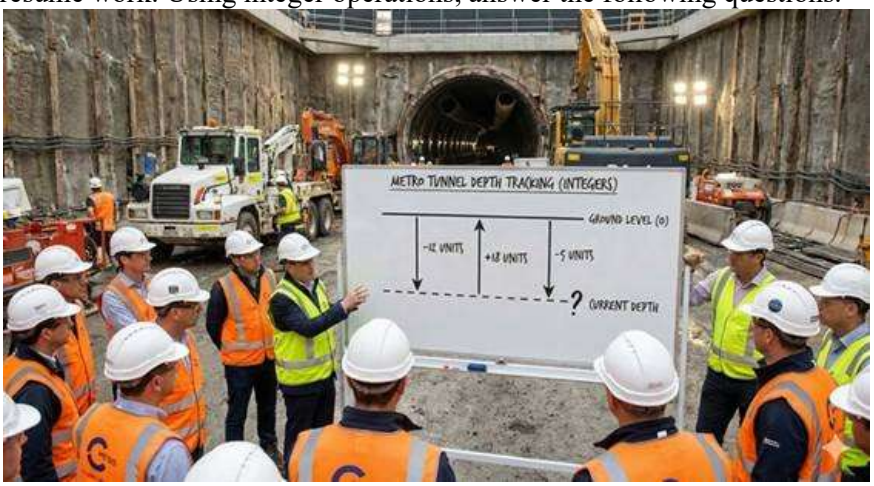


Based on the above, answer the following questions

(a) Write the integer that represents the land subsiding by 16 units after the first tremor.
(b) Find the land elevation after it rises by 23 units from the subsided level.
(c) Calculate the final land elevation after it sinks by 4 units again.
(d) State whether the final elevation is above, below, or at the original ground level.

20. *Case Study 2:*

During metro construction, engineers track tunnel depth using integers. Ground level is zero. The tunnel boring machine first moves down 12 units, then comes up 18 units for inspection, and finally moves down 5 units to resume work. Using integer operations, answer the following questions.



Based on the above, answer the following questions

(a) Write the integer that represents the first downward movement of the tunnel boring machine.
(b) Find the position of the machine after it moves up 18 units for inspection.
(c) Calculate the final depth of the tunnel after the machine moves down 5 units again.
(d) State whether the final position is above, below, or at the ground level.

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PRACTICE PAPER 30

CHAPTER 10 THE OTHER SIDE OF ZERO

SUBJECT: MATHEMATICS *MAX. MARKS : 40*

CLASS : VI **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Start at –9. If you **add 12** and then **subtract 5**, the final integer is:
(a) –2 (b) +2 (c) –4 (d) +4

2. Which integer x satisfies: $-4 < x < +2$?
(a) –6 (b) –3 (c) +2 (d) +4

3. Which option balances the equation? $-7 + \square = +5$
(a) +10 (b) +12 (c) +11 (d) +13

4. Which statement explains why $-1 > -8$?
(a) –1 is positive (b) –1 is closer to zero
(c) –8 has no inverse (d) –8 lies right of –1

5. Start at 0. Apply +15, –22, +6. Final position is:
(a) –1 (b) –7 (c) +1 (d) –3

6. Which integer has the **least distance** from zero?
(a) –11 (b) +7 (c) –3 (d) +5

7. A student writes: $-14 + 9 = +5$
The error is in:
(a) Addition rule (b) Sign of answer (c) Value of –14 (d) Value of 9

8. Which comparison is correct?
(a) $-21 > -19$ (b) $-8 < -13$ (c) $-4 > -17$ (d) $-6 = -9$

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason

(R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Adding zero to an integer does not change its value.
Reason (R): Zero is the additive identity.

10. Assertion (A): (–6) – (+9) = –15
Reason (R): Subtracting a positive integer moves left on number line

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. (a) Write the additive inverse of –72
(b) Find their sum

12. (a) Starting integer = –18, final integer = +7
(b) Find the total movement

13. (a) Which is greater: –56 or –49?
(b) Give one valid reason

14. (a) Final result = –12, starting integer = +5
(b) Find the operation performed

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. (a) Evaluate: –48 + 26
(b) Explain using number-line movement
(c) State the sign of result

16. (a) Rewrite as addition: +9 – (+34)
(b) Solve
(c) Interpret the result

17. (a) Arrange: –12, +31, –57 in increasing order
(b) Find the integer Nearest to zero
(c) Find the integer Farthest from zero

SECTION – D

Questions 18 carry 5 marks each.

18. A scientific probe is initially 6 units above reference level. It descends 19 units, rises 12 units, descends 7 units, and finally rises 3 units.
(a) Write the integer expression
(b) Simplify stepwise
(c) Find the Final position
(d) Find the Net movement
(e) Find the Position relative to reference level

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1:*

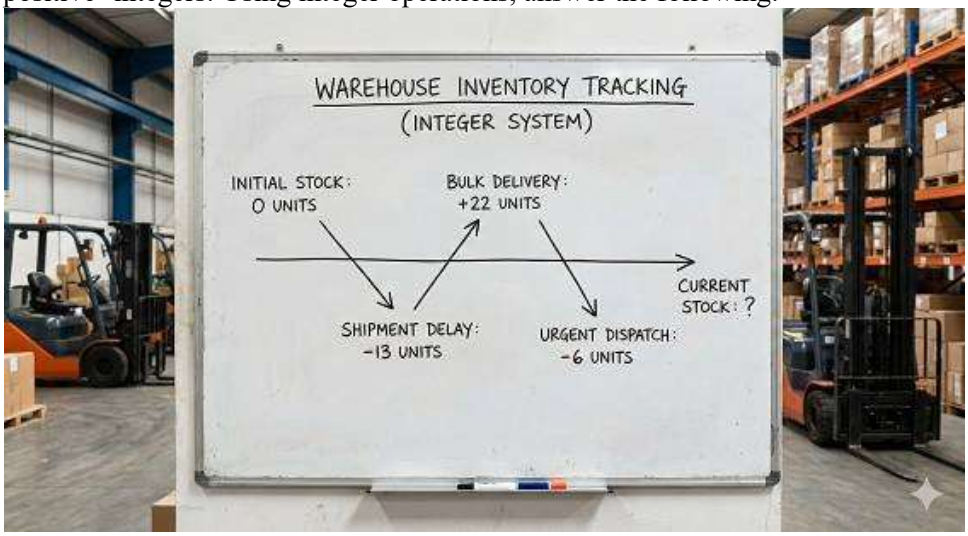
Researchers record changes in Arctic ice thickness using integers, where zero represents the baseline thickness. During summer, the ice thins by 18 units. In winter, snowfall increases thickness by 26 units. In early spring, partial melting reduces thickness by 5 units. Positive integers represent increase, while negative integers represent decrease. Using integer operations, answer the following questions.



(a) Write the integer that represents the decrease in ice thickness by 18 units during summer.
(b) Find the ice thickness after it increases by 26 units in winter.
(c) Calculate the final ice thickness after it decreases by 5 units in early spring.
(d) State whether the final thickness is above, below, or equal to the baseline thickness.

20. *Case Study 2:*

A warehouse tracks inventory changes using integers. Zero represents the initial stock level. A shipment delay causes a reduction of 13 units. Later, a bulk delivery adds 22 units. Finally, urgent dispatch reduces stock by 6 units. Losses are shown as negative integers and additions as positive integers. Using integer operations, answer the following.



(a) Write the integer that represents the reduction of 13 units in stock due to shipment delay.
(b) Find the stock level after a bulk delivery increases the stock by 22 units.
(c) Calculate the final stock level after urgent dispatch reduces the stock by 6 units.
(d) State whether the final stock level represents a surplus, deficit, or zero stock.

Solutions

PRACTICE PAPER 01 (2025-26)
CHAPTER 01 PATTERNS IN MATHEMATICS
(ANSWERS)

SECTION – A

1. Ans. **(c) 72**
Pattern: Add consecutive even numbers: +6, +10, +14, +18, +22
50 + 22 = **72**

2. Ans. **(b) 5**
Pattern: Add 1 symbol each step.
Next step: ◆◆◆◆◆ (5 symbols)

3. Ans. **(c) 25**
Pattern: 1^2, 2^2, 3^2, 4^2, __, 6^2
$4^2 = 16$, next is 5^2 = **25**

4. Ans. **(d) 90** Hexagon = 6 sides
15 hexagons: 15 × 6 = **90 sides**

5. Ans. **(c) Divide by 2**
64 → 32 → 16 → 8 → **4**

6. Ans. First term = 2 Multiply by 5 repeatedly: 2, 10, 50, **250**
Answer is **(d) 250**

7. Ans. **(c) 63**
Pattern rule: Multiply previous term by 2 and add 1.
3 × 2 + 1 = 7
7 × 2 + 1 = 15
15 × 2 + 1 = 31
31 × 2 + 1 = 63

8. A pattern starts with 100 and halves each time. What is 4th term?
(a) 20 (b) 25 (c) 12.5 (d) 10
Ans. **(c) 12.5**
100 → 50 → 25 → **12.5**

9. Ans. (d) A is false but R is true.

10. A Ans. (a) Both A and R are true and R is the correct explanation of A.

SECTION – B

11. Ans. Pattern rule: Divide by 2 each step. 1250 ÷ 2 = 625
625 ÷ 2 = 312.5

12. Ans. Pattern rule:
◆
●
◆◆
●●
◆◆◆
Next: ●●●

13. If 20 pentagons are arranged, find total sides. Explain.
Ans. Pentagon = 5 sides
20 pentagons: 20 × 5 = **100 sides**

14. Fill missing numbers: 4, 12, 36, ____, 324, ____.

Ans. Pattern rule: Multiply by 3 4 × 3
= 12
12 × 3 = 36
36 × 3 = 108
108 × 3 = 324
324 × 3 = 972
Missing terms: 108 and 972

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Ans: 4 + 5 = 9 tiles per set
270 ÷ 9 = 30 sets
Black tiles = 30 × 4 = 120
White tiles = 30 × 5 = 150

16. Ans: 6 × 2 = 12 – 2 = 10
10 × 2 = 20 – 2 = 18
18 × 2 = 36 – 2 = 34
34 × 2 = 68 – 2 = 66
66 × 2 = 132 – 2 = 130
Hence, the first 6 terms are 6, 10, 18, 34, 66, 130

17. Ans: 2 × 3 = 6 – 1 = 5
5 × 3 = 15 – 1 = 14
14 × 3 = 42 – 1 = 41
41 × 3 = 123 – 1 = 122
122 × 3 = 366 – 1 = 365

SECTION – D

Questions 18 carry 5 marks each.

18. Ans. (a) Pattern rule: Multiply step number × 2^2 1st step: $1^2 \times 2 = 2$
2nd: $2^2 \times 2 = 8$
Pattern incorrect in original paper. Adjust: Each step multiplies step number by 2 and adds previous step.

Alternatively: Pattern doubles then adds 2.
2, 6, 12, 20, 30, 42
(b) 4th step: 20
5th step: 30
(c) Total blocks: 2 + 6 + 12 + 20 + 30 = 70 blocks
(d) Planning saves resources.
(e) Add 2, 4, 6, 8 progressively.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. A. Ans. Pattern unit: 2 blue + 4 red = 6 stripes
96 ÷ 6 = 16 sets
(a) 16 sets × 2 = **32 blue stripes**

(b) 16 sets × 4 = **64 red stripes**
(c) 95 ÷ 6 = 15 sets, remainder 5
In a set: First 2 are blue, next 4 are red.
Remainder 5 → 2 blue + 3 red.
So, 95th stripe is **red**
(d) Pattern understanding avoids error in design.

20. Ans. Pattern unit: 5 national + 3 school = 8 flags 128 ÷ 8 = 16 full sets
(a) 16 sets × 5 = 80 blue banners.
(b) 16 sets × 3 = 48 yellow banners
(c) 125 ÷ 8 = 15 sets, remainder 5
Remainder 5 → 5 blue banners.
125th flag is a blue banner
Patterns help in fast arrangement and prevent mistake

PRACTICE PAPER 02
CHAPTER 01 PATTERNS IN MATHEMATICS
(ANSWERS)

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : VI **DURATION : 1½ hrs**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Ans. **(a) 37**
Pattern adds consecutive odd numbers:
+3, +5, +7, +9, +11
26 + 11 = **37**

2. Ans. **(b) 31**
Each term: (previous term × 2) + 1
15 × 2 = 30, 30 + 1 = **31**

3. Ans. **(b) 22**
Start with 2:
2 × 4 = 8, 8 – 2 = 6 (2nd term)
6 × 4 = 24, 24 – 2 = **22** (3rd term)

4. Ans. **(c) 11**
Pattern: Add 2 stars each step.
Term 5: 9 stars
Term 6: 11 stars

5. Ans. **(b) 350**
Decagon has 10 sides.
35 × 10 = **350**

6. Ans. **(b) 38**
Pattern: +4, +6, +8, +10
28 + 10 = **38**

7. Ans. **(b) 49**
Pattern: Square numbers.
36 (6^2), next is 7^2 = **49**

8. Ans. **(a) 81** Tripling pattern:
3 → 9 → 27 → 81 (4th step)

9. **Ans.** (d) A is false but R is true.
The correct pattern is +4, +6, +8... So missing number is 12 + 10 = **22**, not 20.
R is true but does not match the pattern.

10. Answer: (a) Both A and R are true and R is the correct explanation of A.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Complete and explain: 800, 400, 200, 100, ___, ___.
Ans. Pattern: Divide by 2
100 ÷ 2 = 50
50 ÷ 2 = 25

12. Pattern: ◆ ■ ◆◆ ■■ ◆◆◆. Predict next two terms. Explain.
Ans. Pattern:
◆
■
◆◆
■■
◆◆◆
Next: ■■■, then ◆◆◆◆

13. Ans: Each term: Multiply by 2, then add 1 3 × 2 + 1 = 7
7 × 2 + 1 = 15
15 × 2 + 1 = **31**
31 × 2 + 1 = 63

14. How many sides in total are present in 12 octagons? Show your working.
Ans. Octagon: 8 sides
12 × 8 = **96 sides**

SECTION – C

Questions 15 to 17 carry 3 marks each.

15.
(a) Ans: Differences: +3, +5, +7, +9, +11 ⇒
26 + 11 = 37, 37 + 13 = 50
(a) 37, 50
(b) Differences increase by 2
(c) Odd number addition pattern.

16.
(a) Ans: Pattern: +2, +3, +4, +5...
(a) 15 + 6 = 21; 21 + 7 = 28
(b) 15 + 21 = 36
(c) 10 – 3 = 7

17. A. Ans: Pattern: Multiply previous term by 2 then subtract 1
2, 3 (= 2 × 2 – 1), 5 (= 3 × 2 – 1), 9 (= 5 × 2 – 1), 17 (= 9 × 2 – 1)
Next: 17 × 2 – 1 = 33, then 33 × 2 – 1 = 65
(b) 65 × 2 – 1 = 129
(c) 9 + 17 = 26

SECTION – D

18.
(a) Ans:
(a) Multiply by 2 ⇒ 3 → 6 → 12 → 24 → 48
(b) 24

(c) 48
(d) 3 + 6 + 12 + 24 + 48 = 93
(e) 48 – 3 = 45

SECTION – E (Case Study Based Questions)

19. Ans. **(a)** Each pattern set = 3 (black) + 7 (white) = 10 tiles 500 ÷ 10 = **50 full sets**
(b) Each set has 3 black tiles
50 × 3 = **150 black tiles**
(c) Each set has 7 white tiles
50 × 7 = **350 white tiles**
(d) 456 ÷ 10 = 45 full sets = 450 tiles
456 – 450 = 6th tile in next cycle →
Cycle: 1–3 (black), 4–10 (white) → 6th tile is **white**

20. Ans. **(a)** Each pattern = 6 red + 10 blue = 16 lights
256 ÷ 16 = **16 complete cycles**
(b) Each cycle has 6 red lights
16 × 6 = **96 red lights**
(c) Each cycle has 10 blue lights
16 × 10 = **160 blue lights**
(d) 255 ÷ 16 = 15 full cycles = 240 lights
255 – 240 = 15th light in next cycle →
Cycle: 1–6 (red), 7–16 (blue) → 15th light is **blue**

PRACTICE PAPER 03
CHAPTER 01 PATTERNS IN MATHEMATICS
(ANSWERS)

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

SECTION – A

1. Ans. (c) 144
Pattern: Squares of natural numbers → $12^2 = 144$,

2. Ans. (b) 15
The differences are increasing by 1 each time, so it follows a triangular number pattern:
Figure 5: 10 + 5 = 15 dots

3. Ans. (a) 30
Pattern differences: +4, +6, +8, +10...
Next term = 20 + 10 = 30

4. Ans. (d) 19
1st square = 4 matchsticks
Every next square adds only 3 (since 1 is shared)
→ So for 6 squares:
= 4 + (5 × 3)
= 4 + 15 = 19 matchsticks

5. Ans. (a) 21
For 10 triangles:
1st triangle = 3 matchsticks
Next 9 triangles = 9 × 2 = 18 matchsticks
Total = 3 + 18 = 21 matchsticks

6. Ans. (c) 125
Pattern is cube numbers: $2^3=8$, $3^3=27$, $4^3=64$, $5^3=125$, $6^3=216$

7. Ans. (a) Black
Pattern: Black, White, White, Black, White, White...
We divide the position 19 by 3 to see where it falls in the pattern.
19 ÷ 3 = 6 remainder 1
This means 19th tile is the 1st tile of a new group i.e. Black

8. Ans. (a) 12
Total cubes = 4 (sides) × 4 (cubes per side) = 16
But since 4 corner cubes are shared, subtract 4 duplicate counts:
Total = 16 – 4 = 12 cubes

9. Ans. (c) A is false but R is true
Cubes of even numbers are even → Reason true
But not all cubes are odd → Assertion false

10. **A**ns. (d) A is false but R is true
Pattern 2,4,7,11 has differences 2,3,4 → not constant
Arithmetic pattern requires constant difference → Assertion false

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Write the 9th term of the pattern formed by adding consecutive odd numbers starting from 1.
Ans. We are adding consecutive odd numbers starting from 1:
So the pattern is:
1
1 + 3 = 4
1 + 3 + 5 = 9
1 + 3 + 5 + 7 = 16
1 + 3 + 5 + 7 + 9 = 25
1 + 3 + 5 + 7 + 9 + 11 = 36
1 + 3 + 5 + 7 + 9 + 11 + 13 = 49
1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = 64
1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 = 81

12. Ans. The pattern repeats every 3 tiles. Check
remainder when 16 ÷ 3:
16 ÷ 3 = 5 remainder 1
So, the 16th tile corresponds to position 1 in the repeating group: Red

13. Ans. The letters are skipping one each
time: A (1st), C (3rd), E (5th), G (7th), I
(9th), ... So the position values are: 1, 3, 5,
7, 9, 11, 13
13th letter = M

14. Ans. Terms: 1st = 3
2nd = 3 × 2 = 6
3rd = 6 × 2 = 12
4th = 12 × 2 = 24
5th = 24 × 2 = 48

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Ans. From the pattern, we can see: Row number = number of shapes in that row So, 10th row has 10 shapes
We add all the shapes from each row:
1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55

16. Ans. Number of tiles in 6th row: 6 × 6 = 36
Number of tiles in 8th row: 8 × 8 = 64
Total tiles till 6^{th} row = 1 + 4 + 9 + 16 + 25 + 36 = 91

17. Ans. Pattern rule - Multiply the term number by itself and then subtract 1 Term
1 = 1 × 1 – 1 = 1 – 1 = 0
Term 2 = 2 × 2 – 1 = 4 – 1 = 3
Term 3 = 3 × 3 – 1 = 9 – 1 = 8
Term 4 = 4 × 4 – 1 = 16 – 1 = 15
Term 5 = 5 × 5 – 1 = 25 – 1 = 24
Term 6 = 6 × 6 – 1 = 36 – 1 = 35

SECTION – D

18. Ans. (a) Start from 5, and add 4 for each next lantern.
(b) Continue the pattern step by step:
5 (1st), 9 (2nd), 13 (3rd), 17 (4th), 21 (5th), 25 (6th), 29 (7th), 33 (8th), 37 (9th), 41 (10th)
(c) Total pieces used to make 10 lanterns = 5 + 9 + 13 + 17 + 21 + 25 + 29 + 33 + 37 + 41
= 230 paper pieces needed for 10 lanterns
(d) Total pieces used to make 9 lanterns = 5 + 9 + 13 + 17 + 21 + 25 + 29 + 33 + 37 = 189
So, only 9 lanterns can be made with 200 pieces.

SECTION – E (Case Study Based Questions)

19. Ans. (a) The number of tiles increases by odd numbers — add 3, then 5, then 7, 9, 11, etc. 2 → 5 → 10 → 17
(+3 → +5 → +7)
Next: +9 → Step 5 = 17 + 9 = 26
Then: +11 → Step 6 = 26 + 11 = 37
(b) From above:
Step 5 = 17 + 9 = 26
Step 6 = 26 + 11 = 37
Hence, 6th step will need 37 tiles
(c) Total tiles for 6 steps = 2 + 5 + 10 + 17 + 26 + 37 = 97 tiles
(d) 6 steps = 97 tiles
7th step → Add 13 → 37 + 13 = 50 → 97 + 50 = 147 (Too much)
Hence, Raj can decorate 6 steps fully with 100 tiles.

20. Ans. (a) 1 → 3 → 6 → 10
(+2 → +3 → +4)
It means we are adding the next number each time:
Row 1: 1
Row 2: 1 + 2 = 3
Row 3: 3 + 3 = 6
Row 4: 6 + 4 = 10
Row 5: 10 + 5 = 15
Row 6: 15 + 6 = 21
Row 7: 21 + 7 = 28
Row 8: 28 + 8 = 36
Row 9: 36 + 9 = 45
Hence, the pattern adds 2, 3, 4, 5... each time (called triangular numbers).
(b) Row 9 = 45 lights
(c) Total lights in first 9 rows = 1 + 3 + 6 + 10 + 15 + 21 + 28 + 36 + 45 = 165
(d) Total lights from Row 1 to 8 = 120 lights
Total lights in Row 9 = 45 more
Hence, Only 8 rows can be lit fully with 120 lights.

PRACTICE PAPER 04
CHAPTER 02 LINES AND ANGLES (ANSWERS)
SECTION – A

1. Ans. (a) two right angles
→ A straight angle = 180°, and two right angles = 90° + 90°

2. Ans. (b) where two rays meet
→ The vertex is the point where two rays form an angle

3. Ans. (b) 180°
→ 90° + 90° = 180°, forming a straight angle

4. Ans. (b) 170°
→ 170° is more than 90° but less than 180° ⇒ obtuse angle

5. Ans. (b) 180°
→ Sum of angles in any triangle = 180°

6. Ans. (c) three
→ Three angles are formed: between ray 1 and 2, ray 2 and 3, and ray 1 and 3

7. Ans. (b) an acute-angled triangle
→ All three angles (60°, 70°, 50°) < 90°, so triangle is acute-angled

8. Ans. (c) open door
→ An open door clearly forms an angle at the hinge (vertex)

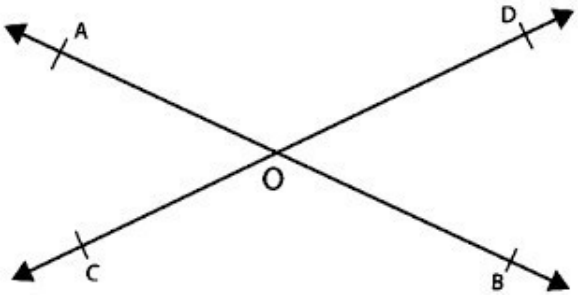
9. Ans. (a) Both A and R are true and R is the correct explanation of A.
→ Reflex angles are >180°, so greater than a straight angle (180°)

10. Ans. (a) Both A and R are true and R is the correct explanation of A.
→ Acute angles are always < 90°, so they can't be greater than a right angle

SECTION – B.

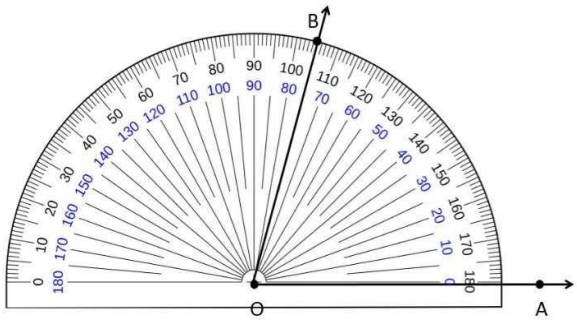
11. Ans. Here, ∠BER = 180° (straight angle)
⇒ ∠BES + ∠SER = 180°
⇒ ∠BES + 90° = 180°
⇒ ∠BES = 90°
Now, ∠BET = ∠BES + ∠SET
Here, ∠SET = ∠RES - ∠TES
⇒ ∠SET = 90° – 80° = 10°
∠BET = ∠BES + ∠SET = 90° + 10° = 100°.

12. Ans. Draw two intersecting lines, say AB and CD, intersecting at point O.



Angles formed: ∠AOC, ∠BOD, ∠AOD, ∠BOC
→ Angles opposite each other are called **vertically opposite angles** and are equal
Classification depends on the figure and their degree (acute, right, obtuse)

13. Write the steps to draw a 75° angle using a protractor. Name the vertex and arms.
Ans. Steps to draw 75° angle:



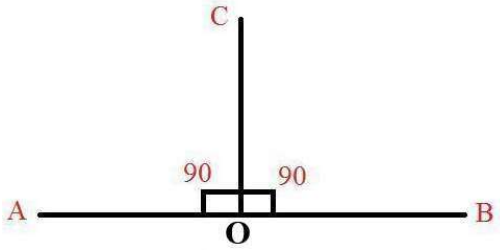
- Draw a base line and mark ray OA
- Mark a point O on the line
- Place protractor's center on point O
- Mark point B at 75°
- Draw ray OB
  → Vertex = O
  → Arms = ray OA and ray OB

14. A triangle has one right angle and another angle of 30°. Find the third angle. What type of triangle is it?
Ans. Sum of triangle's angles = 180°
Given: 90° and 30°
Third angle = 180° − (90° + 30°) = **60°**
→ Triangle is **right-angled and acute-angled** (since other angles < 90°)

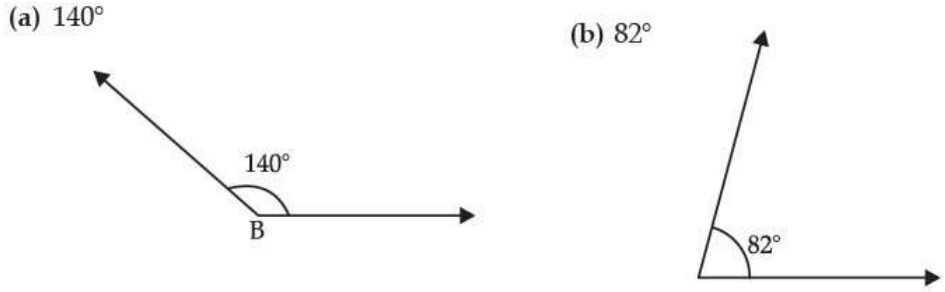
SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Ans. (a) Draw line AB, and mark midpoint O
(b) From O, draw ray OC perpendicular to AB → two right angles: ∠AOC, ∠COB
(c) Divide each right angle into two equal parts → ∠AOD = 45°, ∠DOB = 45°
→ Total 4 angles of 45° formed

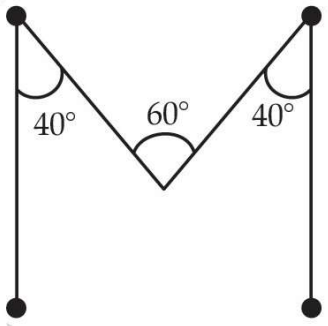


16. Draw angles with the following degree measures:
(a) 140°, (b) 82°
Ans.



17. Draw the letter 'M' such that the angles on the sides are 40° each and the angle in the middle is 60°

Ans.



SECTION – D

Questions 18 carry 5 marks each.

18. Ans. (a) Angles: 90°, 45°, 45° → right-angled triangle
(b) Draw triangle with one right angle at vertex A
(c) Drop perpendiculars from each vertex to opposite side
→ 3 perpendiculars = 3 new right angles
(d) Total right angles formed = **6**
→ 3 original vertex angles + 3 perpendiculars
(e) $\angle A + \angle B + \angle C = 90° + 45° + 45° = 180°$
Hence, it follows angle sum property

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Ans. (a) At 2:00 PM:



→ Angle = 2 × 30° = **60°**

At 4:00 PM:

→ Angle = 4 × 30° = **120°**

(b) 120° > 60°, so **angle at 4:00 PM is greater**

(c) 60° = acute 120° =
obtuse

(d) Draw two clock faces:

- At 2:00, hour hand at 2, minute hand at 12
- At 4:00, hour hand at 4, minute hand at 12 Mark angles between hands*

20.

(a) Ans. (a) 95° = obtuse
185° = reflex

(b) Change in angle = 185° − 95° = **90°**

(c) *Draw two diagrams with same vertex and two different rays showing each position*

(d) If the shade turns 270°, the angle = **reflex angle**

PRACTICE PAPER 05 (2025-26) CHAPTER 02 LINES AND ANGLES (ANSWERS)

SECTION – A

1. Ans. (b) Right angle — 90° angle is called a right angle.

2. Ans. (b) A part of a line with one endpoint, extending infinitely — a ray.

3. Ans. (b) 2:00 — hands form 60° at 2:00.

4. Ans. (b) Zero angle — measures exactly 0°.

5. Ans. (d) 360° — sum of angles around a point.

6. Ans. Missing angle = 360° – (120° + 150°) = 90°. So (a) 90°.

7. Ans. (c) Protractor — tool to measure angles.

8. Ans. (b) Obtuse angle — between 90° and 180°.

9. Ans. (a) Both A and R are true and R is the correct explanation of A.
— reflex angle is >180° and less than 360°, larger than straight angle.

10. Ans. (a) Both A and R are true and R is the correct explanation of A.
— acute angle < right angle, which is 90°.

SECTION – B

11. Ans. Here, ∠BXE = 115°, ∠CXE = 85°, ∠AXB = 65° and ∠BXC = 30°

12. Ans. Sum of given angles = 110° + 95° + 45° = 250°
Missing angle = 360° – 250° = 110°

13. Ans. At 5:00, angle between hands is 150°, which is obtuse.

14. Ans. 24-hour clock divided into 24 equal parts Angle between adjacent marks = 360° ÷ 24 = 15°

SECTION – C

15. Ans. 1 marks for each correct angle.

16. Find the angle between the hands of a clock at 8:00 and classify it.

Ans. At 8:00:

- Hour hand at 8 → 8 × 30 = 240°
- Minute hand at 12 → 0°
  Angle = 240° (larger), smaller angle = 360° – 240° = 120° (obtuse).

17. Ans. Sum given = 100° + 85° + 95° = 280°
Missing angle = 360° – 280° = 80° (acute).

SECTION – D

18. Ans. Sum of angles around a point = 360°
Third angle = 360° – (135° + 75°) = 360° – 210° = **150°**
Classification:
135° → Obtuse
75° → Acute
150° → Obtuse

SECTION – E (Case Study Based Questions)

19. *Ans. (i) Sum of angles in a triangle = 180° Third angle = 180° – (70° + 55°) =* ***55°***
(ii) Angle types: 70° (acute), 55° (acute), 55° (acute)
(iii) Sum verification: 70 + 55 + 55 = 180°

20. Ans. (i) Fourth angle = 360° – (85° + 95° + 110°) = 360° – 290° = **70°**
(ii) Classify: 85° and 70° are **acute**, 95° and 110° are **obtuse**
(iii) Sum check: 85 + 95 + 110 + 70 = 360°

PRACTICE PAPER 06

CHAPTER 02 LINES AND ANGLES (ANSWERS)

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Ans. (a) 70°
A straight angle is 180°. If one part is 110°, the other = 180° – 110° = 70°.

2. Ans. (b) Q

3. Ans. (c) OB, OA

4. Ans. (a) 135°
Sum of angles at a point = 360°. Third angle = 360° – (130° + 95°) = 135°.

5. Ans. (b) 180°
At 6 O'clock, the hour and minute hands are opposite, forming a straight angle of 180°.

6. Ans. (a) 95°
Adjacent angles on a straight line sum to 180°. So, 180° – 85° = 95°.

7. Ans. (d) reflex

8. Ans. (a) 3:00
At 3:00, the hands form a right angle (90°).

9. Ans. (a) Both A and R are true and R is the correct explanation of A.

10. Ans. (a) Both A and R are true and R is the correct explanation of A.
Angles around a point sum to 360° because the arms complete a full rotation.

SECTION – B

11. Ans. ∠DCM, ∠MCN, ∠NCB, ∠DCN, ∠MCB, ∠DCB.

12. Ans. Angles at point sum to 360°. Given two angles = 85°, 95°
Third angle = 360° – (85° + 95°) = 180°.
Type of third angle: **Straight angle** (180°).

13. Ans. Ratio = 3:2
Sum = 180°
One part = 180° ÷ (3+2) = 36°
Angles = 3×36° = 108°, and 2×36° = **72°**.

14. Ans. At 9 O'clock, hour hand at 9, minute hand at 12. Angle between hands = 90°.
It is a **right angle**.

SECTION – C

15. Ans. (a) ∠CBE (b) ∠AEB (c) ∠ABE (d) ∠ABC, ∠BCD, ∠BED (e) ∠AED

16. Ans. Using the outer scale, you can directly read off ∠a = 40°.
(1) ∠a =180° –140° = 40° (2) ∠b =140° −100° = 40°
(3) ∠c = 100° − 50° = 50° (4) ∠d = 50°

(5) $\angle ABD = 100°$ (6) $\angle CBE = \angle b + \angle c = 40° + 50° = 90°$.

17. Ans. Let smaller angle = x Larger angle = x + 40° Sum = 180° (straight angle) So, x + (x + 40) = 180

$2x + 40 = 180$

$2x = 140$

$x = 70°$, larger angle = 110°.

SECTION – D

18. Ans. (a) An angle of 150° is an **obtuse angle**. The difference between this angle and a straight angle is $180° - 150° = 30°$.

(b) An angle of 30° is an **acute angle**. The sum of the two angles is $150° + 30° = 180°$.

(c) A right angle measures 90°. An angle of 22.5° is a fraction of this. The fraction is 22.5/90 = 1/4. The angle of 22.5° is 1/4 of a right angle.

SECTION – E (Case Study Based Questions)

19. Ans. (a) Third angle = 360° – (120° + 95°) = 360° – 215° = **145°**

(b) 145° is an **obtuse angle**.

(c) Sum of three angles at a point = **360°**.

(d) It is important because the paths cover all directions around the meeting point, ensuring complete coverage and space around that point.

Ans. (a) At 2 o'clock, angle between hands = 60° (each hour is 30°, 2 hours apart → 2×30 = 60°)

(b) 60° is an **acute angle**.

(c) At 2:30, the minute hand is pointing exactly at the 6.

20. The hour hand, however, has moved halfway between the 2 and the 3.

Each hour on a clock face represents an angle of 30° (360°/12 hours).

The angle from the 2 to the 6 is 4 hours × 30° = 120°.

The hour hand has moved 1/2 of the way from the 2 to the 3, which is (1/2) × 30° = 15°.

Therefore, the angle between the hands is 120° - 15° = 105°.

(d) Clock hands form different angles because they move continuously and their relative positions change, creating acute, right, obtuse, or reflex angles at different times.

PRACTICE PAPER 07 CHAPTER 03 NUMBER PLAY (ANSWERS)

SECTION – A

1. Ans. (a) Possible.
Ends can be 0; the pattern 0,1,2,0,1,0 can be realized by a suitable ordering of distinct heights.

2. Ans. (d) 5400.
To be a supercell the centre must be > 5320, 5200, 5100 and 5300. 5400 is > all of them.

3. Ans. (c) 11:22
03:30 → 0330 reversed 0330 → palindrome
04:40 → 0440 reversed 0440 → palindrome
11:22 → 1122 reversed 2211 → not palindrome
05:50 → 0550 reversed 0550 → palindrome

4. Ans. (b) 9
Smallest 5-dgit number divisible by 9 is 10008 and the digit sum is 9

5. Ans. (a) 5

In units place: 10, 20, 30, 40, 50 → that's **5 zeros**.

6. Ans. (d) 9999.
9999 is a 4-digit palindrome and its digit sum = 36 (divisible by 9), so 9999 is the largest 4-digit palindrome divisible by 9.

7. Ans. (d) All appear equally often.
For hundreds place in numbers 100–999 the hundreds digit runs uniformly 1..9 each for 100 numbers — so each appears equally often.

8. Ans. (a) 4.
With moves 1..6 the modulus is 7. Target 60 → 60 mod 7 = 4, so first move should be 4 to force the winning pattern.

9. Ans. (a) Both A and R are true and R is the correct explanation of A.
For numbers with all digits equal, the largest and smallest numbers are the same (e.g., 1111 and 1111).
Subtracting them gives 0 immediately.
Since the process results in 0, it does not continue and does not reach 6174.

10. Ans. (a) Both A and R are true and R is the correct explanation of A.
Start with 8 (which is 2×2×22 \times 2 \times 22×2×2)
Step 1: 8 ÷ 2 = 4
Step 2: 4 ÷ 2 = 2
Step 3: 2 ÷ 2 = 1
It took exactly 3 steps to reach 1.

SECTION – B

11. Ans. Smallest: **1008** (To find the smallest number, the first digit should be as small as possible. 1 + 0 + 0 + 8 = 9.)

Largest: **9000** (To find the largest number, the first digit should be as large as possible. 9 + 0 + 0 + 0 = 9.)

12. Ans. Three supercells — 5600, 5700, 5720.

13. Ans. Smallest 5-digit number with digit sum 23 → 10499.
(Constructed to keep leftmost small: 1 + 0 + 4 + 9 + 9 = 23 and 10499 is the smallest numeric value with that sum.)

14. Ans. All 3-digit palindromes from digits {4,6,9} (repetition allowed):
444, 464, 494, 646, 666, 696, 949, 969, 999.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Perform the Kaprekar process for 9013 until 6174 is reached. State steps.
Ans. Treat numbers as 4-digit with leading zeros if needed.

1. Start 9013
   A = digits desc → 9310
   B = digits asc → 0139
   C = 9310 − 0139 = 9171
2. Take 9171
   A = 9711, B = 1179
   C = 9711 − 1179 = 8532
3. Take 8532
   A = 8532, B = 2358
   C = 8532 − 2358 = 6174

Total steps: 3 (9013 → 9171 → 8532 → 6174).

16. Start with the number 59. Reverse its digits and add it to the original number. If the result is not a palindrome, repeat the process with the new number. Find the palindrome number you get after this process.
Ans. Step 1: Number: 59
Reverse: 95
Add: 59 + 95 = 154
Is 154 a palindrome?
No, because reversed is 451.
Step 2: Number: 154
Reverse: 451
Add: 154 + 451 = 605
Step 3: Number: 605
Reverse: 506
Add: 605 + 506 = 1111
1111 is a palindrome

17. Ans. The largest even number is 4312. The smallest odd number is 1243.
Difference: 4312 - 1243 = 3069.

SECTION – D

18. Ans. Apply rule: if n even → n/2 ; if n odd → 3n + 1.
Sequence: 19 (odd) → 58 (even) → 29 (odd) → 88 (even) → 44 (even) → 22 (even) → 11 (odd) → 34 (even) → 17 (odd) → 52 (even) → 26 (even) → 13 (odd) → 40 (even) → 20 (even) → 10 (even) → 5 (odd) → 16 (even) → 8 (even) → 4 (even) → 2 (even) → 1.

- Total steps (arrows): 20 steps.
- Maximum number reached in the sequence: 88 (this sequence climbs to 88 before descending).

SECTION – E (Case Study Based Questions)

19.

(a) Ans.
(a) Current supercells (strictly greater than immediate up/down/left/right neighbours): 61000 (neighbours 60600, 60800)
61500 (neighbours 60800, 60700, 61200)
61800 (neighbours 60800, 62000? careful: up=60800, down=60400, left=60600, right=60700; 61800 > all)
62000 (neighbours 60700, 59900, 60400, 60200 → 62000 > all)
So there are **4 supercells** initially: **61000, 61500, 61800, 62000**.

(b) Two one-digit changes that create at least +2 more supercells (one digit changed in two different cells):
One concrete working pair (change the first digit 6 → 7 in two cells): Change cell (row 2, col 4): **60500 → 70500** (first digit 6→7).
Change cell (row 3, col 1): **60300 → 70300** (first digit 6→7).

61000	**60800**	**61500**	**61200**
60600	61800	60700	70500
70300	60400	62000	60200
60000	60100	59900	59800

20. Kaprekar Contest
(b) Ans. Starting numbers:
A: 8640
Kaprekar steps:

1. 8640 → 8640 − 0468 = 8172
2. 8172 → 8721 − 1278 = 7443
3. 7443 → 7443 − 3447 = 3996
4. 3996 → 9963 − 3699 = 6264
5. 6264 → 6642 − 2466 = 4176
6. 4176 → 7641 − 1467 = 6174

Steps: 6
B: 7032
Kaprekar steps:

7. 7032 → 7320 − 0237 = 7083
8. 7083 → 8730 − 0378 = 8352
9. 8352 → 8532 − 2358 = 6174

Steps: 3
C: 5421
Kaprekar steps:

10. 5421 → 5421 − 1245 = 4176

11. $4176 \rightarrow 7641 - 1467 = 6174$

Steps: 2

(a) Steps: A → 6, B → 3, C → 2.

(b) C (5421) reaches 6174 first (fewest steps).

PRACTICE PAPER 08

CHAPTER 03 NUMBER PLAY (ANSWERS)

SECTION – A

1. Ans. **(b) 105** (The smallest 3-digit number is 100.
100 / 15 = 6 with a remainder of 10. The next multiple is 15 x 7 = 105.)

2. Ans. **(b) 4**
A 4-digit palindrome is abba. The thousands digit a and the units digit a are the same.

3. Ans. **(c) 13**
The digit '3' appears in 3, 13, 23, 30, 31, 32, 33 (two times), 34, 35, 36, 37, 38, 39.
The total is 1 + 1 + 1 + 10 = 13.

4. Ans. **(b) 40** (40 is larger than all its neighbors: 31, 38, 36, 32, 30, 29.)

5. Ans. **(a) 975**
The largest odd digits are 9, 7, 5, 3, 1. To form the largest number, the digits should be in descending order: 975.

6. Ans. **(c) 555**

The Kaprekar's constant process requires a number with at least two different digits. For 555, the difference is 0, so it will not reach 495.

7. Ans. **(b) 1483**
To form the smallest odd number, the smallest digits must be in the most significant places, with an odd digit at the end. The odd digits are 1, 3. The smallest number with 1 at the end is 3481.

The smallest with 3 at the end is 1483. The smallest is 1483.

8. Ans. **(c) 7**

4^2=16. The digit sum is 1 + 6 =7.

9. Ans. (a) Both A and R are true, and R is the correct explanation of A.
A is true. The only 4-digit number with a digit sum of 36 is 9999, and a palindrome is a number that reads the same forwards and backwards. Since 9999 reads the same forwards and backwards, it is a palindrome.
R is true. The maximum possible digit sum for a 4-digit number is 9+9+9+9 = 36. Therefore, 9999 is the only 4-digit number with this digit sum.

10. Ans. (d) A is false, but R is true.
A is false. The sum of two prime numbers is not always an even number. For example, 2 + 3 = 5. Here, 2 and 3 are prime numbers, and their sum is 5, which is an odd number.
R is true. A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself. The number 2 is the only even prime number, because any other even number is divisible by 2. All other prime numbers, such as 3, 5, 7, 11, etc., are odd.

SECTION – B

11. Ans. **13**
The digit '2' appears in 2, 12, 20, 21, 22 (two times), 23, 24, 25, 26, 27, 28, 29.

12. Ans. Smallest: **102**
The smallest three different digits are 0, 1, 2. The number is 102.

Largest: **987**
The largest three different digits are 9, 8, 7. The number is 987.

13. Ans. **10, 5, 16, 8, 4, 2, 1**.

14. Ans. 1
The only 2-digit number with a digit sum of 1 is 10.

SECTION – C

15. Ans. Smallest: **1002** (1 + 0 + 0 + 2 = 3).
Largest: **3000** (3 + 0 + 0 + 0 = 3).

16. Ans. The **Kaprekar's constant** for 3-digit numbers is 495. The number 693 has different digits. Step 1: 963 - 369 = 594
Step 2: 954 - 459 = 495 It will reach the constant.

17. Ans. The completed square is:

4	9	2
3	5	7
8	1	6

SECTION – D

18. Ans. The **Kaprekar's constant** for 4-digit numbers is 6174. The process is to take any 4-digit number with at least two different digits, arrange the digits to form the largest and smallest possible numbers, and find their difference. This is repeated until 6174 is reached.
Example using 3456:
Step 1: 6543 - 3456 = 3087
Step 2: 8730 - 0378 = 8352
Step 3: 8532 - 2358 = 6174

SECTION – E (Case Study Based Questions)

1. Ans. (a) A 5-digit palindrome is a number of the form **abcba**.
(b) The sum of the digits is 2a + 2b + c = 21.
c = 5. 2a + 2b + 5 = 21 ⇒ 2a + 2b = 16 ⇒ a + b = 8.
Possible pairs (a, b) are (1, 7), (2, 6), (3, 5), (4, 4), (5, 3), (6, 2), (7, 1), (8, 0).
The password is 17571 (using a = 1, b = 7).

2. *Ans. (a) The rules for the **Collatz sequence** are: if the number is even, divide it by 2; if the number is odd, multiply it by 3 and add 1.*
(b) The sequence for the number 13: 13
(odd) ⇒ 3 x 13 + 1 = 40
40 (even) ⇒ 40 / 2 = 20
20 (even) ⇒ 20 / 2 = 10
10 (even) ⇒ 10 / 2 = 5
5 (odd) ⇒ 3 x 5 + 1 = 16
16 (even) ⇒ 16 / 2 = 8
8 (even) ⇒ 8 / 2 = 4
4 (even) ⇒ 4 / 2 = 2
2 (even) ⇒ 2 / 2 = 1 The sequence is 13, 40, 20, 10, 5, 16, 8, 4, 2, 1.

PRACTICE PAPER 09
CHAPTER 03 NUMBER PLAY (ANSWERS)
SECTION – A

1. Ans. (b) 9997
The largest 4-digit number is 9999. 9999 / 13 = 769 with a remainder of 2.
So, required number = 9999 – 2 = 9997

2. Ans. (d) All the above

3. Ans. **(c) 18**
The digit '7' appears in 7, 17, 27, 37, 47, 57, 67, 70, 71, 72, 73, 74, 75, 76, 77 (2 times), 78, 79.
That's 8 + 10 = 18.

4. Ans. **(b) 90**
90 is larger than all its neighbors: 88, 86, 87, 82, 85.

5. Ans. **(b) 1111**
The Kaprekar's constant process requires at least two different digits. For 1111, the difference is 0, so it will not reach 6174.

6. Ans. (a) 2079
The smallest odd number using these digits is 2079

7. Ans. (b) 5
$2 \times 2 \times 2 \times 2 \times 2 = 32$
Sum of digits = 3 + 2 = 5

8. Ans. (a) 9620

9. Ans. (c) A is true but R is false.
Assertion (A): The assertion is **true**. By arranging the digits 8, 6, 3, and 2 in descending order, we get the largest possible number, which is 8632.
Reason (R): The reason is **false**. To form the **largest** number, you must arrange the digits in **descending** order. Arranging them in ascending order would create the smallest possible number (in this case, 2368).

10. Ans. (d) A is false but R is true.
Assertion (A): The assertion is **false**. A palindromic number reads the same forwards and backward. The number 196 reads as "691" when reversed. Therefore, 196 is not a palindrome. **Reason (R):** The reason is **true**. It correctly defines a palindromic number. Numbers like 66, 848, 575, and 1111 are given as examples of palindromes because they read the same from both directions.

SECTION – B

11. Ans. The digit '8' appears in 8, 18, 28, 38, 48, 58, 68, 78, 80, 81, 82, 83, 84, 85, 86, 87, 88 (two times), 89.
Total Number of times = 8 + 10 + 1 = 19.

12. Ans. Smallest: **135**
The smallest different odd digits are 1, 3, 5. The smallest number is 135. Largest: **975**
The largest different odd digits are 9, 7, 5. The largest number is 975.

13. Ans. 48 + 84 = 132
Reverse 132 to get 231.
Add the numbers: 132 + 231=363. The number
363 is a palindrome.

14. Ans. The numbers are 1002, 1011, 1020, 1101, 1110, 1200, 2001, 2010, 2100, 3000.
Total ten 4-digit numbers are there having a digit sum of 3.

SECTION – C

15. Ans. All 3-digit palindromes using {2,4,7}:
222, 242, 272, 424, 444, 474, 727, 747, 777

16. Ans. Digits {3,5,6,9}:
Largest (descending) → 9 6 5 3 → **9653**.
Smallest (ascending with thousands≥1) → 3 5 6 9 → **3569**.
Sum = 9653 + 3569 = 13,222
Difference = 9653 – 3569 = 6,084

17. Ans. The completed square is:

4	3	8
9	5	1
2	7	6

SECTION – D

18. Ans. The **Collatz sequence** is a sequence of numbers where you start with a positive integer and apply a rule: if the number is even, you divide it by 2; if the number is odd, you multiply it by 3 and add 1. The process is repeated until the sequence reaches 1.
Example using the starting number 20:

- 20 (even) → 20 / 2 = 10
- 10 (even) → 10 / 2 = 5
- 5 (odd) → 3 * 5 + 1 = 16
- 16 (even) → 16 / 2 = 8
- 8 (even) → 8 / 2 = 4
- 4 (even) → 4 / 2 = 2
- 2 (even) → 2 / 2 = 1

The sequence is 20, 10, 5, 16, 8, 4, 2, 1.

SECTION – E (Case Study Based Questions)

1. *Ans. (a) A 5-digit palindrome is a number of the form **abcba**.*
(b) The sum of the digits is 2a + 2b + c = 25.
c = 7. 2a + 2b + 7 = 25 ⇒ 2a + 2b = 18 ⇒ a + b = 9.
Possible pairs (a, b) are (1, 8), (2, 7), (3, 6), (4, 5), (5, 4), (6, 3), (7, 2), (8, 1), (9, 0).
The password is **18781** (using a = 1, b = 8).

2. *Ans. (a) The **Kaprekar's constant** for 4-digit numbers is **6174**.*
(b) **Kaprekar's process for 9210 → 6174** (full steps):
Start: 9210 → A = 9 2 1 0 → 9210; B = 0 1 2 9 → 0129 = 129
Subtract: 9210 – 0129 = 9081
Next: 9081 → A = 9 8 1 0 → 9810; B = 0 1 8 9 → 0189 = 189
Subtract: 9810 – 0189 = 9621
Next: 9621 → A = 9621; B = 1269 → 9621 – 1269 = 8352.
Next: 8352 → A = 8532; B = 2358 → 8532 – 2358 = 6174.
Sequence: **9210 → 9081 → 9621 → 8352 → 6174.**

PRACTICE PAPER 10
CHAPTER 04 DATA HANDLINGS AND PRESENTATIONS
(ANSWER)
SECTION – A

1. Ans. (b) 7
Total for other sports = 10 + 15 + 8 = 33
he total number of students surveyed was 40. The number of students who like Hockey is the total number of students minus the number of students who like the other sports i.e. 40 - 33 = 7 Therefore, the frequency of students who like Hockey is 7.

2. Ans. (c) 75 kg
Bar height = 5 units Scale = 15 kg per unit
Weight = 5 units × 15 kg/unit = 75 kg.

3. Ans. (b) 🚗🚗 🚗 🚗 and a half 🚗

4. Ans. (b) 60 trees
Bar height = 6 units Scale = 1 trees per unit
Number of trees = 6 units × 10 trees/unit = 60 trees.

5. Ans. (b) 9 Total cars = 45
Key = 5 cars per symbol
Symbols needed = 45 ÷ 5 = 9 symbols.

6. Ans. (b) 2
The heights are: 145 cm, **150 cm**, 148 cm, **150 cm**, and 147 cm.
The students with heights of 150 cm and 150 cm meet this condition. Therefore, 2 students have a height of at least 150 cm.

7. Ans. (c) 75,000
Bar height = 15 units
Scale = 5000 people per unit
Population = 15 units × 5000 people/unit = 75,000 people.

8. Ans. (a) 2 complete symbols and a partial symbol
To represent 12 footballs, you divide the total number of footballs by the value of one symbol. 12 ÷ 5 = 2.4
This means you need two full symbols (2 × 5 = 10 footballs) and a partial symbol to represent the remaining 2 footballs. The term "partial symbol" is the most accurate description.

9. Ans. (a) Both A and R are true and R is the correct explanation of A.
Number of people for the first bar = 8 units * 100 people/unit = 800 people. Number of people for the second bar = 12 units * 100 people/unit = 1200 people. Total people = 800 + 1200 = 2000 people. So, Assertion (A) is **True**. Now, We added the unit lengths (8+12) and then multiplied by the scale (100). So, Reason (R) is also **True**, and it is the correct explanation for Assertion (A).

10. Ans. (a) Both A and R are true and R is the correct explanation of A.

SECTION – B

11. Ans. Wednesday: 🍊🍊🍊🍊🍊 (5 symbols) Friday: 🍊🍊🍊 (3 symbols)

12. Ans. Students in Class 6 = 12 units × 5 = 60 students.
Students in Class 7 = 15 units × 5 = 75 students.
Total students = 60 + 75 = **135 students**.

13. Ans. The data in ascending order is: **10, 10, 15, 15, 18, 20, 22, 22, 25**. Smallest value = 10, Largest value = 25.
The value 15 appears **2 times**.

14. . Ans.

Color	Tally Marks	Frequency
Blue	𝍸 III	8
Red	𝍸𝍸II	12
Green	𝍸 I	6
Yellow	IIII	4
Pink	𝍸𝍸	10

SECTION - C

15.

Marks	Tally Marks	Frequency
5	III	3
6	III	3
7	𝍸	5
8	𝍸 I	6
9	III	3
10	I	1

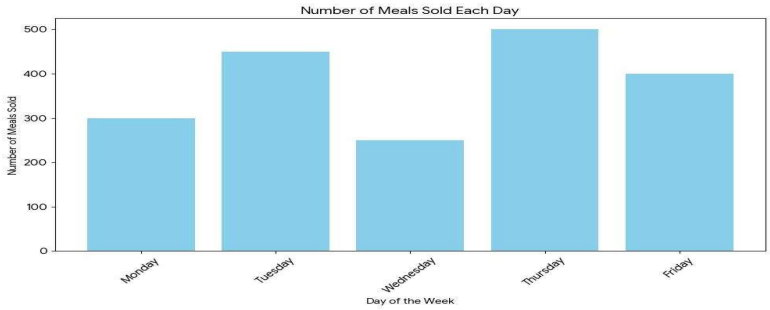
The most frequently occurring mark is **8**, with a frequency of 6 students.

16. Ans. The key is 🍎 = 10 apples.
(a) Apples sold on Thursday = 6 symbols × 10 = 60 apples.
Apples sold on Wednesday = 3 symbols × 10 = 30 apples.
Difference = 60 - 30 = **30 apples**.
(b) Total apples sold = (4 + 5 + 3 + 6) symbols × 10 apples/symbol = 18 × 10 = **180 apples**.

17. Ans. Scale = 1 unit length = ₹500. Food: ₹5,000 ÷ ₹500 = **10 units**. Education: ₹3,000 ÷ ₹500 = **6 units**. Transport: ₹2,500 ÷ ₹500 = **5 units**.

SECTION - D

18.
(a) A suitable scale would be 1 unit length = 100 meals, as all the frequencies are multiples of 50.



(b) The most number of meals were sold on **Thursday** (500 meals). The day with the least sales was **Wednesday** (250 meals). The difference is 500 - 250 = **250 meals**.

SECTION – E (Case Study Based Questions)

19. *Ans. The symbol 🐦 = 5 birds.*

(a) Number of crows = 35. Symbols needed = 35 ÷ 5 = **7 symbols**.

(b) The most seen bird is the **Pigeon** with 40 birds. It would be represented by 40 ÷ 5 = **8 symbols**.

(c) Total birds = 25 + 40 + 35 + 15 = 115. Total symbols = 115 ÷ 5 = **23 symbols**.

(d) With a scale of 🐦 = 1 bird, the number of symbols needed is 115. This is not a good choice because drawing 115 individual symbols is very time-consuming and would take up too much space.

20. *Ans. (a) The height of the bar for Class 2 would be 45 books ÷ 5 books/unit = **9 units**.*

(b) The classes with the least number of books are Class 4 (25) and Class 1 and 5 (30).

The least number is 25, and the next least is 30.

The combined total for the least number of books issued is 25 + 30 = **55 books**.

(c) The number of books issued in Class 1 (30) is the same as in Class 5 (30).

This suggests that the reading habits of those two classes were identical in that month.

(d) Height of Class 3 bar = 50 ÷ 5 = 10 units.

Height of Class 4 bar = 25 ÷ 5 = 5 units.

The bar for Class 3 is 10 - 5 = **5 units taller** than the bar for Class 4.

PRACTICE PAPER 11
CHAPTER 04 DATA HANDLINGS AND PRESENTATIONS
(ANSWERS)

SECTION – A

1. Ans. **(b) Collect the raw data**

The first step in any data handling process is to **collect the raw data**. Before you can organize, analyze, or represent the information in a table or graph, you must first gather the individual responses from each student.

2. Ans. **(a)** ▲▲▲▲▲▲▲ **and a half** ▲

To find the number of symbols needed to represent 75 trees, you divide the total number of trees by the value of one symbol:

75 ÷ 10 = 7.5

This means you need **7 full symbols** (7 x 10 = 70 trees) and **one half symbol** to represent the remaining 5 trees (0.5 x 10 = 5 trees).

3. Ans. (c) 450 kg

Weight of the first bar = 8 units × 25 kg/unit = 200 kg Weight of the second bar = 10 units × 25 kg/unit = 250 kg Total weight = 200 kg + 250 kg = **450 kg**

4. Ans. (a) 17 units

Height of the bar = 85 runs ÷ 5 runs/unit = **17 units**

5. Ans. (b) 7

Number of symbols = 140 cars ÷ 20 cars/symbol = **7 symbols**

6. Ans. (b) Add the frequencies.

The **frequency** of an item is the number of times it appears in the data set. To find the total number of items (or observations), you simply add up the frequencies for all the different categories. For example, if a table shows that 5 students like math and 10 students like science, the total number of students is 5 + 10 = 15.

7. Ans. (c) 70

The number of full symbols = 3, representing 3 × 20 = 60 cars. The number of half symbols = 1, representing 1 × (20/2) = 10 cars. Total cars = 60 + 10 = **70 cars**.

8. Ans. (b) 20 units

Height of the bar = 40 students ÷ 2 students/unit = **20 units**

9. Ans. (a) Both A and R are true and R is the correct explanation of A.

Assertion (A): This statement is **true**. Using a 1:1 scale for a large data set (e.g., representing 1000 items with a bar 1000 units high) is impractical and inefficient.

Reason (R): This statement is also **true** and directly explains the assertion. A 1:1 scale with large frequencies would create a bar that is too tall to be drawn on a standard piece of paper, making a different scale a necessity.

10. Ans. (c) A is true but R is false.

Assertion (A): This statement is **true**. The length of a bar is what visually represents the frequency or value of a particular data category.

Reason (R): This statement is **false**. The reason describes a **pictograph**, not a bar graph. A pictograph uses pictures or symbols to represent data, while a bar graph uses rectangular bars.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Ans. Minimum number of students is **0** and the maximum is **5**. Total students = 3 + 5 + 2 + 0 + 4 = **14 students**.

12. Ans. 145 trees = 145 ÷ 10 = 14.5 symbols.
This would be represented by **14 complete symbols and a half symbol**.

13. Ans. Scale = 1 unit length = 5,000 people. Height for 2001: 50,000 ÷ 5,000 = **10 units**.
Height for 2021: 1,00,000 ÷ 5,000 = **20 units**.

14. Ans. The value 150 appears **2 times**.
Total cars = 150 + 200 + 150 + 250 + 100 + 200 = **1050 cars**.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Ans. A suitable scale would be 1 unit length = ₹500.
House rent: ₹2500 ÷ ₹500 = **5 units**.
Food: ₹4000 ÷ ₹500 = **8 units**.
Education: ₹2000 ÷ ₹500 = **4 units**.
Transport: ₹1500 ÷ ₹500 = **3 units**.

16.
(a) Ans. (a)

Marks	Tally Marks	Frequency
10	I	1
12	III	3
15	𝍸 II	7
18	IIII	4

(b) The most common mark is **15**, with a frequency of 7.

17. Ans. The key is 🚆 = 500 cars.
(a) Number of symbols needed for 3250 cars = 3250 ÷ 500 = 6.5.
This would be represented by **6 complete symbols and a half symbol**.
(b) Total cars = 5 complete symbols + a half symbol = 5.5 symbols.
Total cars = 5.5 × 500 = **2750 cars**.

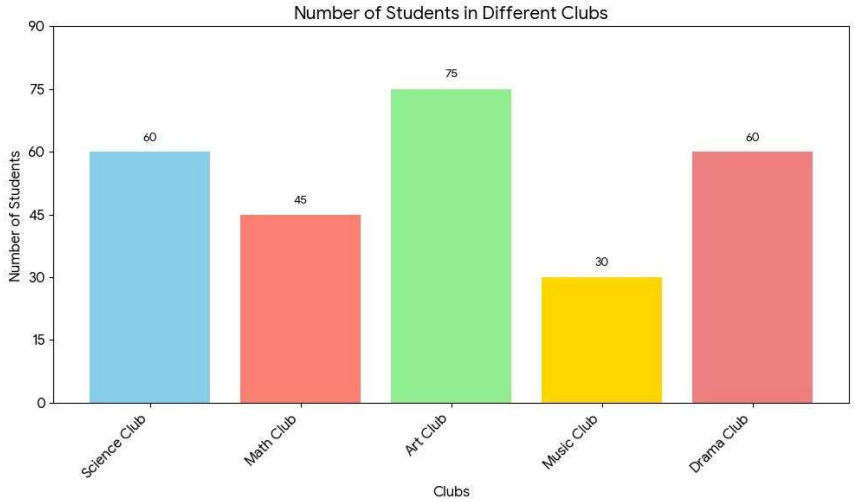
SECTION – D

Questions 18 carry 5 marks each.

18. Ans. (a)

Clubs	Number of students
Science Club	60
Math Club	45
Art Club	75
Music Club	30
Drama Club	60

(b) A suitable scale would be 1 unit length = 15 students, as all frequencies are multiples of 15.



(c) The **Art Club** has the maximum number of students (75). It has 75 - 30 = **45 more students** than the Music Club.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. *Case Study 1: The Class Birthday Chart*

Ans. (a) The number of symbols for March is the number of birthdays divided by the value of one symbol: 10 birthdays ÷ 2 birthdays/symbol = **5 symbols**.

(b) The difference in birthdays between February and April is: 8 - 4 = **4 birthdays**.

(c) The total number of birthdays in the listed months is: 6 + 8 + 10 + 4 = 28.

The number of birthdays in the unlisted months is the total number of students minus the listed birthdays: 30 - 28 = **2 birthdays**.

(d) To represent 4 birthdays in April, you would need **2 symbols** (4 ÷ 2 = 2).

20. *Case Study 2: The Supermarket Survey*

Ans. (a) The total number of responses is the sum of the frequencies for all fruits: 15 + 10 + 12 + 8 + 5 = **50 responses**.

(b) The fruit with the lowest frequency is **Orange**, with only 5 customers preferring it.

(c) The height of the bar for Mangoes would be the frequency divided by the scale: 12 ÷ 2 = **6 units**.

(d) The difference in preference between Apples and Grapes is: 15 - 8 = **7 customers**.

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PRACTICE PAPER 12
CHAPTER 04 DATA HANDLINGS AND PRESENTATIONS
(ANSWERS)

SECTION – A

1. Ans. (c) 2
The data is: 3, 5, 2, 0, 4, 3. The number **3** appears twice, while all other numbers appear only once. Therefore, the frequency of 3 is 2. The other numbers (0, 2, 4, 5) have a frequency of 1. The **maximum frequency** is the highest number of times any single value appears in the data set. In this case, the maximum frequency is 2.

2. Ans. (c) 750 books
First bar: 6 units×50 books/unit=300 books Second bar: 9 units×50 books/unit=450 books
The total number of books is the sum of the books from both bars. Total books: 300+450=750 books

3. Ans. B. 70:- 20 = 3.5

4. Ans. (a) 5000
Population: 10 units × 500 people/unit = 5000 people

5. Ans. (a) 15
The number of students who prefer Cricket is **20**. The number of students who prefer Tennis is **5**. Difference: 20 – 5 = 15

6. Ans. (a) 5 complete symbols and a partial symbol

7. Ans. (c) 4 units
Bar height: 8 movies ÷ 2 movies/unit = 4 units

8. Ans. (b) 7
The **range** is the difference between the highest and lowest values in a data set. Highest value: 15,
Lowest value: 8
Range: 15−8=7

9. Ans. (a) Both A and R are true and R is the correct explanation of A.
The reason correctly explains why a frequency table helps find the mode. The **mode** is the value that appears most often, and a frequency table explicitly lists how many times each value occurs (its frequency)

10. Ans. (b) Both A and R are true and R is not the correct explanation of A.
The assertion is correct because both types of graphs are used to represent categorical data and can display the same information. The reason provides a correct definition for both pictographs and bar graphs, but it does **not** explain why they can represent the same data. The reason simply defines each type of graph.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Ans. Ascending order: **1, 2, 2, 3, 3, 4, 4, 4, 5, 5.**

The most common number of books read is **4**.

12. Ans. Cars on Monday = 8 units × 15 = 120 cars. Cars on Tuesday = 11 units × 15 = 165 cars.
Total cars = 120 + 165 = **285 cars**.

13. Ans. Symbols for 150 trees = 150 ÷ 25 = **6 symbols**.
Total trees for 5 and a half symbols = 5.5 × 25 = **137.5 trees**.

14. Ans. Scale = 1 unit length = 5 marks. Height for Math = 95 ÷ 5 = **19 units**. Height for Science = 80 ÷ 5 = **16 units**.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15.

(a) Ans. (a)

Club	Tally Marks	Number of Students
Football	𝍸𝍸𝍸𝍸𝍸.	25
Cricket	𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸.	40
Basketball	𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸.	30
Tennis	𝍸𝍸𝍸𝍸.	15

(b) The **Tennis** club has the least number of students (15).

16.

Ans. The key is  = 5 toys.
(a) Total symbols = 5 + 7 + 4 + 3 = 19 symbols.
Total toys = 19 × 5 = **95 toys**.
(b) Toys on Tuesday = 7 × 5 = 35 toys.
Toys on Wednesday = 4 × 5 = 20 toys.
Difference = 35 - 20 = **15 toys**.

17. Ans. Scale = 1 unit length = ₹1000. Food: ₹5000 ÷ ₹1000 = **5 units**. Rent: ₹8000 ÷ ₹1000 = **8 units**. Savings: ₹2000 ÷ ₹1000 = **2 units**.

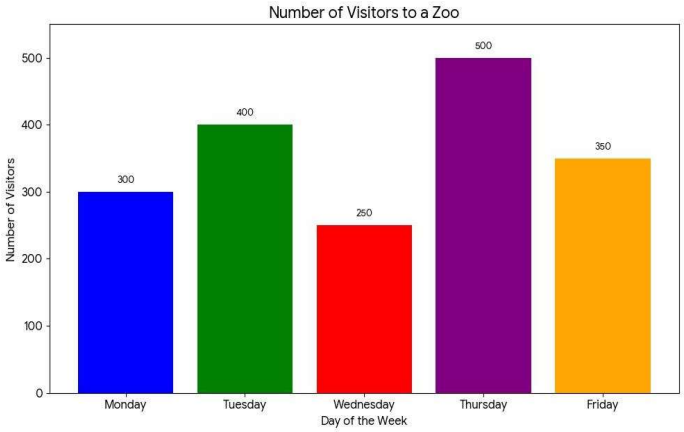
SECTION – D

Questions 18 carry 5 marks each.

18. Ans. (a)

Day	Number of visitors
Monday	300
Tuesday	400
Wednesday	250
Thursday	500
Friday	350

(b) A suitable scale would be 1 unit length = 50 visitors, as all frequencies are multiples of 50.



(c) Total visitors = 300 + 400 + 250 + 500 + 350 = 1800 visitors. Average = 1800 ÷ 5 = **360 visitors**.

SECTION – E (Case Study Based Questions)

19. Ans. (a) Class 9 planted 45 saplings.
This would be represented by **4 complete symbols and a half symbol** (45 ÷ 10 = 4.5).
(b) Symbols for Class 8 = 60 ÷ 10 = 6 symbols. Symbols for Class 7 = 50 ÷ 10 = 5 symbols. The difference is 6 - 5 = **1 symbol**.
(c) Total saplings = 40 + 50 + 60 + 45 + 55 = **250 saplings**.

If the scale was changed to = 5 saplings, the number of symbols needed for Class 10 would be 55 ÷ 5 = **11 symbols.**

20. *Ans. The scale is 1 unit length = 200 vehicles.*
(a) 7-8 am: 10 units = 10 × 200 = 2000 vehicles.
8-9 am: 12 units = 12 × 200 = 2400 vehicles.
9-10 am: 8 units = 8 × 200 = 1600 vehicles.
10-11 am: 6 units = 6 × 200 = 1200 vehicles.
Total vehicles = 2000 + 2400 + 1600 + 1200 = **7200 vehicles**.
(b) The traffic was the heaviest between **8-9 am**, with **2400 vehicles** passing during that time.
(c) Difference = 2400 - 1600 = **800 more vehicles**.
(d) The two hours with the least traffic are 10-11 am (1200 vehicles) and 9-10 am (1600 vehicles).
Combined total = 1200 + 1600 = **2800 vehicles**

PRACTICE PAPER 13

CHAPTER 05 PRIME TIME (ANSWERS)

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Ans. (b) $2^2 \times 3 \times 7$
$84 = 2 \times 42 = 2 \times (2 \times 21) = 2 \times 2 \times (3 \times 7) = 2^2 \times 3 \times 7$.

2. Ans. (a) 21
A number that is a multiple of both 3 and 7 must be a multiple of their LCM. Since 3 and 7 are prime, their LCM is their product, $3 \times 7 = 21$.

3. Ans. (b) 2187
A number is divisible by 9 if the sum of its digits is divisible by 9.

4. Ans. (b) 7
The prime numbers between 20 and 50 are 23, 29, 31, 37, 41, 43, and 47. There are 7 prime numbers.

5. Ans. (d) 6
We need to find the smallest number to add to 540 to make it divisible by 7.
Divide 540 by 7: $540 \div 7 = 77$ with a remainder of 1.
To get a number divisible by 7, we need to add $7 - 1 = 6$ to 540.
$540 + 6 = 546$, and $546 \div 7 = 78$.

6. Ans. (c) 618
A number is divisible by 6 if it is divisible by both 2 and 3.

Divisibility by 2: The number must be even. All options are even.
Divisibility by 3: The sum of the digits must be divisible by 3.
(a) $4 + 1 + 2 = 7$ (not divisible by 3)
(b) $5 + 1 + 4 = 10$ (not divisible by 3)
(c) $6 + 1 + 8 = 15$ (divisible by 3)
(d) $7 + 2 + 4 = 13$ (not divisible by 3)
Only 618 is divisible by both 2 and 3.

7. Ans. (c) 28
Only 28 is a multiple of 7 in the option
$28 \div 5 = 5$ with a remainder of 3.

8. Ans. (b) They have no common factors other than 1.
This is the definition of co-prime numbers. For example, 8 and 9 are co-prime, but neither is a prime number.

9. Ans. (a) Both A and R are true, and R is the correct explanation of A.
The assertion that 29 is a prime number is true. The reason provides the correct definition of a prime number, which explains why 29 is a prime number.

10. Ans. (a) Both A and R are true, and R is the correct explanation of A.
The smallest composite number is 4, which is even, so the assertion is true. The reason correctly defines a composite number and provides the factors of 4 to prove it.

SECTION – B

11. Ans. Prime factorization of 168:
168 = 2 × 84 = 2 × 2 × 42 = 2 × 2 × 2 × 21 = 2 × 2 × 2 × 3 × 7 = 2^3 × 3 × 7.

12. Ans. Divisibility test for 8: A number is divisible by 8 if the number formed by its last three digits is divisible by 8.
The last three digits of 3456 are 456.
Divide 456 by 8: 456 ÷ 8 = 57.
Since 456 is exactly divisible by 8, the number 3456 is also divisible by 8.

13. Ans. 840 = 2 × 420
420 = 2 × 210
210 = 2 × 105
105 = 3 × 35
35 = 5 × 7
Putting it all together: 840 = 2 × 2 × 2 × 3 × 5 × 7.

14. Ans. **Divisibility by 8:** A number is divisible by 8 if its last three digits are divisible by 8. The last three digits of 840 are 840. We check if 840 ÷ 8 is an integer. 840 ÷ 8 = 105. Since it is an integer, 840 is divisible by 8.
Divisibility by 11: For a number to be divisible by 11, the difference between the sum of the digits at odd places and the sum of the digits at even places must be either 0 or a multiple of 11.
Sum of digits at odd places: 0 + 8 = 8.
Sum of digits at even places: 4.
Difference: 8 – 4 = 4.
Since 4 is not 0 or a multiple of 11, 840 is **not** divisible by 11.

SECTION – C

15. Ans. The prime numbers are 83, 89, 97, 101, 103, 107, and 109.

16. Ans. To be divisible by both 4 and 10, the number must be a multiple of their LCM, which is 20.
The smallest 4-digit number is 1000.
1000 ÷ 20=50.
Since 1000 is perfectly divisible by 20, the smallest 4-digit number divisible by both 4 and 10 is 1000.

17. Ans. The number is of the form (4×n) + 3. It is also a multiple of 5. This means the number must end in 0 or 5.
A number ending in 0 when divided by 4 leaves a remainder of 0. So, the number must end in 5.
We need the largest 3-digit number ending in 5. It must be of the form (4n + 3).
The largest 3-digit number ending in 5 is 995. Let's check it.
995 ÷ 4 = 248 with a remainder of 3. Correct. So, the largest such number is 995

SECTION – D

18. Ans. Prime factorization of 15 = 3 × 5.
Prime factorization of 20 = 2^2 × 5.
Prime factorization of 25 = 5^2.
LCM = 2^2 × 3 × 5^2 = 4 × 3 × 25 = 12 × 25 = 300.
We need the smallest 5-digit multiple of 300.
The smallest 5-digit number is 10000.
10000 ÷ 300 = 33 with a remainder of 100.
We need to add 300 – 100 = 200 to 10000.

The smallest 5-digit number is 10000 + 200 = 10200.

SECTION – E (Case Study Based Questions)

19. Case Study 1: The School Library

Ans. (a) Prime factorization of 210: $210 = 2 \times 3 \times 5 \times 7$.

(b) Prime factorization of 350: $350 = 2 \times 5 \times 5 \times 7$.

(c) The largest number that is a factor of both 210 and 350 is the product of the common prime factors. The common factors are 2, 5, and 7.

∴ largest number that is a factor of both 210 and 350 = $2 \times 5 \times 7 = 70$.

(d) Rule for 10: A number is divisible by 10 if its last digit is 0.

The last digit of 70 is 0. Therefore, 70 is divisible by 10.

20. Case Study 2: The Traffic Lights

Ans.

(a) Prime factorization of 40: $40 = 2^3 \times 5$.

(b) Prime factorization of 60: $60 = 2^2 \times 3 \times 5$.

(c) To find the smallest number that is a multiple of 40, 60, and 75, we take the highest number of times each prime factor appears. The highest power of 2 is 2^3, of 3 is 3^1, and of 5 is 5^2.

Prime factorization of 75: $75 = 3 \times 5^2$.

∴ smallest number that is a multiple of 40, 60, and 75 = $2^3 \times 3 \times 5^2 = 8 \times 3 \times 25 = 600$.

(d) The lights will turn green together again after 600 seconds. To convert this to minutes, we divide by 60.

∴ 600 ÷ 60 = 10 minutes.

PRACTICE PAPER 14

CHAPTER 05 PRIME TIME (ANSWERS)

SECTION – A

1. Ans. (a) $2^2 \times 3^3$
$108 = 4 \times 27 = 2^2 \times 3^3$.

2. Ans. (d) 87
87 is divisible by 3 (since 8 + 7 = 15, a multiple of 3), and 87 = 3 × 29.
So, 87 is a composite number.

3. Ans. (c) 750
A number is divisible by 5 if its last digit is 0 or 5.

4. Ans. (b) 11
The first multiple of 9 greater than 100 is 9 × 12 = 108.
The last multiple of 9 less than 200 is 9 × 22 = 198.
The number of multiples is 22 – 12 + 1 = 11.

5. Ans. (b) 2
A number is divisible by 3 if the sum of its digits is divisible by 3.
The sum of the known digits in 56_8 is 5 + 6 + 8 = 19.
We need to add a digit to 19 to make it a multiple of 3. The multiples of 3 greater than 19 are 21, 24, 27, ...
19 + 2 = 21. So the smallest digit is 2.

6. Ans. (a) 2×5×7×7
Prime factorization of 490 is:
490 = 10 × 49 = 2 × 5 × 7 × 7

7. Ans. (c) 57
The number must be of the form (6×n)+3.
Let's check the options.
51: 51 = 6 × 8 + 3. It is a valid answer, but not an option.
57 = 6 × 9 + 3. It works. 57 is between 50 and 60.

8. Ans. (b) The number 1 is a prime number.
This is an incorrect statement. The number 1 is neither prime nor composite. It has only one factor, which is itself.

9. Ans. (a) Both A and R are true, and R is the correct explanation of A.
The assertion that 2 and 3 are co-prime is true, as their only common factor is 1. The reason provides the correct definition of co-prime numbers, which explains the assertion.

10. Ans. (a) Both A and R are true, and R is the correct explanation of A.
Both statements are true, and the reason correctly applies the divisibility rule for 9.

SECTION – B

11. Ans. Prime factorization of $9 = 3^2$.
Prime factorization of $15 = 3 \times 5$.
Prime factorization of $24 = 2^3 \times 3$.
The highest power of each prime factor: three 2s, two 3s, and one 5.
$\therefore$ smallest number that is divisible by 9, 15, and $24 = 2^3 \times 3^2 \times 5 = 8 \times 9 \times 5 = 360$.

12. Ans. A number is divisible by 4 if the number formed by its last two digits is divisible by 4.
The last two digits of 984 are 84.
Now, $84 \div 4 = 21$.
Since 84 is exactly divisible by 4, the number 984 is divisible by 4.

13. Ans. $999 = 9 \times 111 = 3^2 \times (3 \times 37) = 3^3 \times 37$.

14. Ans. A number is divisible by 9 if the sum of its digits is divisible by 9.
We check the number 729. The sum of its digits is $7 + 2 + 9 = 18$.
Since 18 is divisible by 9 ($18 \div 9 = 2$), the number 729 is divisible by 9.

SECTION – C

15. Ans. Prime factorization of $6 = 2 \times 3$.
Prime factorization of $9 = 3^2$.
Prime factorization of $12 = 2^2 \times 3$.
LCM $= 2^2 \times 3^2 = 36$.
We need a multiple of 36 between 400 and 500.
$400 \div 36 = 11.11...$
We take the next whole number, 12, and multiply it by 36.
$36 \times 12 = 432$.
This number is between 400 and 500.

16. Ans. Divisibility by 4: Check last two digits. Divisibility by 8: Check last three digits.
1234: Last two digits (34) are not divisible by 4. Not divisible by 4 or 8.
5678: Last two digits (78) are not divisible by 4. Not divisible by 4 or 8.
9012: Last two digits (12) are divisible by 4. Last three digits (012) are not divisible by 8 ($12 \div 8$ as remainder = 4). Divisible by 4, but not by 8.
Hence, None of the numbers is divisible by both 4 and 8.

17. Ans. The number is of the form $(7 \times n)+1$. It is also a multiple of 4. We need the smallest 3-digit number.
The smallest 3-digit number is 100. Let's check multiples of 4: 100, 104, 108, 112, 116, 120, ...
Let's check for a remainder of 1 when divided by 7.
$120 \div 7 = 17$ with a remainder of 1. This is the smallest such 3-digit number.

SECTION – D

18. Ans. Prime factorization of $24 = 2^3 \times 3$.
Prime factorization of $32 = 2^5$.
Prime factorization of $40 = 2^3 \times 5$.
The highest power of each prime factor: five 2s, one 3, and one 5.

Smallest Common Multiple $= 2^5 \times 3 \times 5 = 3^2 \times 15 = 480$.
Now, we find the largest 4-digit multiple of 480. The largest 4-digit number is 9999.
$9999 \div 480 = 20.83...$
We take the whole number part, 20, and multiply it by the Smallest Common Multiple.
$480 \times 20 = 9600$.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: The School Field Trip

Ans. (a) Prime factorization of 288: $288 = 2^5 \times 3^2$.
(b) Prime factorization of 432: $432 = 2^4 \times 3^3$.
(c) The largest number that is a factor of both 288 and 432 is the product of the common prime factors. The common factors are four 2s and two 3s.
∴ largest number that is a factor of both 288 and 432 $= 2^4 \times 3^2 = 16 \times 9 = 144$.
(d) **Rule for 9:** A number is divisible by 9 if the sum of its digits is divisible by 9.
Sum of digits of 432 is $4 + 3 + 2 = 9$.
Since 9 is divisible by 9, 432 is divisible by 9.

20. Case Study 2: The Clock Alarms

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Ans. (a) The prime factorization of 15 is 3×5.
(b) The prime factorization of 20 is $2^2 \times 5$.
(c) To find the smallest number that is a multiple of 15, 20, and 30, we need the prime factorization of 15, 20, and 30 ($30 = 2 \times 3 \times 5$).
The highest power of each prime factor: two 2s, one 3, and one 5.
∴ smallest number that is a multiple of 15, 20, and 30 $= 2^2 \times 3 \times 5 = 60$.
(d) The alarms will ring together again after 60 minutes, which is one hour.
So, the next time they ring together will be at 7:00 AM.

PRACTICE PAPER 15
CHAPTER 05 PRIME TIME (ANSWERS)
SECTION – A

1. Ans. (a) $2^2 \times 3^2 \times 7$
$252 = 4 \times 63 = 2^2 \times 9 \times 7 = 2^2 \times 3^2 \times 7$.

2. Ans. (d) 61
A composite number has more than two factors. 27 (3 × 9), 39 (3 × 13), and 51 (3 × 17) are all composite. 61 is only divisible by 1 and 61, so it is a prime number.

3. Ans. (b) 1331
Sum of digits at odd places: 1 + 3 = 4.
Sum of digits at even places: 3 + 1 = 4.
Difference 4 – 4 = 0.

4. Ans. (c) 2
The smallest prime number is 2, as it is the only even prime and has only two factors (1 and 2).

5. Ans. (b) 2
We need to find the smallest number to add to 110 to make it divisible by 8.
The closest multiple of 8 greater than 110 is 8 × 14 = 112.
We need to add 112 – 110 = 2.

6. Ans. (a) 2 × 3 × 3 × 5 × 7
Prime factorization of 630: 630 = 63 × 10 = 2 × 3 × 3 × 5 × 7

7. Ans. (a) 124
A number is divisible by 4 if its last two digits are divisible by 4.
A number is divisible by 8 if its last three digits are divisible by 8.
124: Last two digits, 24, are divisible by 4 (24 ÷ 4 = 6). The last three digits, 124, are not divisible by 8 (124 ÷ 8 = 15.5).
256: Last three digits, 256, are divisible by 8 (256 ÷ 8 = 32).
312: Last two digits, 12, are divisible by 4. The last three digits, 312, are divisible by 8 (312 ÷ 8 = 39).
424: Last two digits, 20, are divisible by 4. The last three digits, 420, are divisible by 8 (424 ÷ 8 = 53).

8. Ans. (c) If a number is divisible by 12, it is also divisible by 4.
This is a true statement. A number divisible by 12 is also divisible by all the factors of 12, which are 1, 2, 3, 4, 6, and 12.

9. Ans. (a) Both A and R are true, and R is the correct explanation of A.
Both are true. The reason correctly applies the divisibility rule for 3.

10. Ans. (a) Both A and R are true, and R is the correct explanation of A.
The assertion that 51 is a composite number is true. The reason gives a correct divisibility rule (sum of digits is a multiple of 3) and applies it correctly to 51, thus explaining why it is a composite number.

SECTION – B

11. Ans. Prime factorization of $16 = 2^4$.
Prime factorization of $24 = 2^3 \times 3$.
Prime factorization of $32 = 2^5$.
The highest power of each prime factor: five 2s, and one 3.
∴ smallest number that is divisible by 16, 24, and $32 = 2^5 \times 3 = 32 \times 3 = 96$.

12. Ans. Prime factorization of $252 = 2^2 \times 3^2 \times 7$.
Prime factorization of $360 = 2^3 \times 3^2 \times 5$.
The common prime factors are two 2s and two 3s.
∴ greatest common factor of 252 and $360 = 2^2 \times 3^2 = 4 \times 9 = 36$

13. Ans. The prime factorization of 735 is:
$735 = 5 \times 147 = 5 \times 3 \times 49 = 3 \times 5 \times 7 \times 7$.

14. Ans. **Divisibility by 5:** A number is divisible by 5 if its last digit is 0 or 5. The last digit of 9135 is 5. Therefore, 9135 **is** divisible by 5.
Divisibility by 7: To check for divisibility by 7, we can use the following rule: subtract twice the last digit from the number formed by the remaining digits. If the result is divisible by 7, the original number is also divisible by 7.
Number: 9135.
Remaining digits: 913. Last digit: 5.
$913 - (2 \times 5) = 913 - 10 = 903$.
Repeat the process for 903.
Remaining digits: 90. Last digit: 3.
$90 - (2 \times 3) = 90 - 6 = 84$.
Since $84 \div 7 = 12$, 84 is divisible by 7. Therefore, 9135 **is** also divisible by 7.

SECTION – C

15. Ans.
The number must be a multiple of 6, which means it must be a multiple of both 2 and 3. It also has a prime factor of 13.
The number must be a multiple of $2 \times 3 \times 13 = 78$.
We need to find a multiple of 78 between 200 and 300.
$78 \times 2 = 156$ (too small).
$78 \times 3 = 234$. This is in the range.
$78 \times 4 = 312$ (too large).
The number is 234.

16. Ans. **Rule for 11:** The difference between the sum of the digits at odd places and the sum of the digits at even places must be 0 or a multiple of 11.
For 121:
Sum of odd place digits (1+1=2). Sum of even place digits (2).
Difference: 2−2=0. Since the difference is 0, 121 is divisible by 11.
For 1331:
Sum of odd place digits (1+3=4). Sum of even place digits (3+1=4).
Difference: 4−4=0. Since the difference is 0, 1331 is divisible by 11.

17. Ans. The number is of the form (8n + 3). It is also a multiple of 5, which means it must end in

0 or 5.
A number ending in 0 is always even, but (8n + 3) is always odd. So the number must end in 5.
We need the largest 2-digit number ending in 5 that has a remainder of 3 when divided by 8.
2-digit numbers ending in 5: 95, 85, 75, ...
Now, 75 ÷ 8 = 9 with a remainder of 3. This is the largest.

SECTION – D

18. Ans. To find the smallest number that is a multiple of all numbers from 1 to 10, we find the LCM of 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.
We only need to consider the highest powers of the prime factors of these numbers.
The primes are 2, 3, 5, and 7.
Highest power of 2: from 8 (2^3)
Highest power of 3: from 9 (3^2)
Highest power of 5: from 5 and 10 (5^1)
Highest power of 7: from 7 (7^1)
∴ smallest number that is a common multiple of all numbers from 1 to 10 = $2^3 \times 3^2 \times 5 \times 7 = 8 \times 9 \times 5 \times 7 = 2520$.

SECTION – E (Case Study Based Questions)

19. Case Study 1: The Gardener's Plants

Ans. (a) Prime factorization of 180: $180 = 2^2 \times 3^2 \times 5$.
(b) Prime factorization of 270: $270 = 2 \times 3^3 \times 5$.
(c) The greatest common factor is the product of the common prime factors. The common factors are one 2, two 3s, and one 5.
∴ greatest common factor of 180 and 270 = $2 \times 3^2 \times 5 = 90$.
(d) Rule for 10: A number is divisible by 10 if its last digit is 0.
The last digit of 90 is 0. Therefore, 90 is divisible by 10.

20. Case Study 2: The Bus Schedule

Ans. (a) The prime factors of 25 are 5^2.
(b) The prime factors of 30 are $2 \times 3 \times 5$.
(c) To find the smallest number that is a multiple of 25 and 30, we need the highest power of each prime factor. The highest power of 2 is 2^1, of 3 is 3^1, and of 5 is 5^2.
∴ smallest number that is a multiple of 25 and 30 = $2 \times 3 \times 5^2 = 150$.
(d) Both buses will be at the station together again after 150 minutes.

PRACTICE PAPER 16 CHAPTER 06
PERIMETER AND AREA (ANSWERS)
SECTION – A

1. Ans: (b) 5 m
Here, length = 150 cm = 1.5 m and breadth = 1 m Perimeter =
2(l + b) = 2(1.5 + 1) = 2 x 2.5 = 5 m

2. Ans: (a) 64 cm
New side = 8 x 2 = 16 cm
New perimeter = 4 x side = 4 x 16 = 64 cm

3. Ans: (c) becomes one fourth
Consider x as the side of the square.
We know that area of a square = Side × Side = $x \times x = x^2$ If the
sides are halved, we get new side = x/2
So the new area = $(x/2)^2 = x^2/4$
From this we know that the area has become one fourth of its previous value.

4. Ans: (b) 32 cm
Area = side x side = 64 cm^2 ⇒ side = 8 cm
⇒ Perimeter = 4 x side = 4 x 8 = 32 cm

5. Ans: (a) increase

6. Ans. (a) 27 cm.
6 x 4.5 = 27 cm.

7. Ans. (c) 92 sq m.
Area of wall = 10 x 10 = 100 sq m. Area of window = 4 x 2 = 8 sq m. Remaining
Area = 100 - 8 = 92 sq m.

8. Ans: (b) 20 cm
Consider the sides of the rectangle as 5x and 4x.
We know that, perimeter of rectangle = 2 (Length + Breadth) By
substituting the values, we get 72 = 2 (5x + 4x)
⇒ 72 = 2 × 9x ⇒ 72 = 18x ⇒ x = 72/18 = 4
Hence, the length of the rectangle = 5x = 5 × 4 = 20 cm

9. Ans. (a) Both A and R are true, and R is the correct explanation of A.
Area of square = 10 x 10 is 100. Area of
another square = 5 x 5 is 25. 100 = 4 x 25.
Side is doubled (10 = 2 x 5), so the area is 2 x 2=4 times.

10. Ans. (c) A is true, but R is false.
Fencing uses the boundary length (Perimeter), making A true. R is false because the area of the plot is irrelevant to the amount of wire needed.

SECTION – B

11. Ans: Given *l* = 4m. b = 3 m 50 cm = 3.50 m Area = l × b = 4 × 3.50 = 14 m^2
∴ The carpet required to cover the floor is 14 m^2.

12. Ans: Let x cm be the third side Perimeter of triangle = 36 cm
⇒ 12 + 14 + x = 36
⇒ 26 + x = 36

$\Rightarrow x = 36 - 26$

$\Rightarrow x = 10$ cm

$\therefore$ The third side is 10 cm.

13. Ans: Length of required tape = Perimeter of rectangle
= 2 (Length + Breadth) = 2 (40 + 10) = 2 (50) = 100 cm
$\therefore$ The required length of tape is 100 cm.

14. Ans: Perimeter of the field = 2 (Length + Breadth)
= 2 (0.7 + 0.5) = 2 (1.2) = 2 × 1.2 = 2.4 km
Each side is to be fenced with 4 rows = 4 × 2.4 = 9.6 km
$\therefore$ The total length of the required wire is 9.6 km.

SECTION – C

15. Ans: Area of flower square bed = 1 × 1 = 1 m^2
Area of 5 square bed = 1 × 5 = 5 m^2
Area of land = 5 × 4 = 20 m^2
Remaining part of the land = Area of land – Area of 5 square bed
= 20 – 5 = 15 m^2
$\therefore$ The remaining part of the land is 15 m^2.

16. Ans: (a) Area of rectangle = l × b = 9 × 6 = 54 m^2
(b) Area of rectangle = l × b = 17 × 3 = 51 m^2
(c) Area of rectangle = l × b = 4 × 14 = 56 m^2
The area of rectangle 56 m^2, i.e. (c), is the largest area and the area of rectangle 51 m^2, i.e. (b), is the smallest area

17. Ans: Perimeter of square = 4 × side = 4 × 75 = 300 m
$\therefore$ The distance covered by Sweety is 300 m
Perimeter of the rectangular park = 2 (Length + Breadth)
= 2 (60 + 45) = 2 (105) = 2 × 105 = 210 m
$\therefore$ The distance covered by Bulbul is 210 m
Hence, Bulbul covers less distance than Sweety.

SECTION – D

18. Ans:
(i) Length and breadth are trebled
Consider l as the initial length and b as the initial breadth So the
original area = l × b
If the length and breadth are tripled it becomes three times more than the original value New
length = 3l
New breadth = 3b
New area of the rectangle = 3l × 3b = 9lb
Hence, the area of the rectangle becomes 9 times more than its original area.
(ii) Length is doubled and breadth is same
Consider l as the initial length and b as the initial breadth So the
original area = l × b
If the length is doubled and breadth is same we get New
length = 2l
New breadth = b
New area of the rectangle = 2l × b = 2lb
Hence, the area of the rectangle becomes 2 times more than the original area.

SECTION – E (Case Study Based Questions)

19. Ans: (a) Area of orange region = $1 \times 2 = 2$ cm^2

(ii). Area of yellow region = $3 \times 3 = 9$ cm^2

(iii). Area of grey region = $3 \times 3 = 9$ cm^2

(iv). Area of brown region = $2 \times 4 = 8$ cm^2

Total area = $9 + 2 + 9 + 8 = 28$ cm^2

20. Ans. (a) Area = Length x Breadth

Area of Park (Inner Area): 50 m x 30 m = 1500 sq m.

(b) New Length = Inner Length + 2(Path Width);

New Breadth = Inner Breadth + 2(Path Width).

New Length (Outer L): 50 m + 2 m + 2 m = 54 m.

New Breadth (Outer B): 30 m + 2 m + 2 m = 34 m.

(c) Area of Path = Outer Area - Inner Area.

Outer Area: 54 m x 34 m = 1836 sq m.

Area of Path: 1836 sq m - 1500 sq m = 336 sq m.

PRACTICE PAPER 17

CHAPTER 06 PERIMETER AND AREA (ANSWERS)

SECTION – A

1. Ans: (b) 14cm

2. Ans: (d) 300m

Perimeter of a rectangle = 2 (length + breadth) Length of the rectangular field = 3 × breadth

Therefore perimeter of field = 2 (3 × breadth + breadth) = 2 (4 × breadth) = 8 × breadth The given perimeter = 800m ⇒ 8 × breadth = 800 ⇒ breadth = 800 ÷ 8 = 100m

So, length = 3 × 100m = 300m

3. Ans: (b) 400m

We know that, Length of the boundary = Perimeter of the boundary

Given, two rectangular flower beds, each of size 10m × 5m

So, perimeter of remaining park = 90 + 5 + 10 + 95 + 90 + 5 + 10 + 95 = 400 m

4. Ans. As we know, the perimeter of the square = side × 4 = 10 × 4 = 40 cm Given, the side of the square = 10 cm

The side of the square is doubled = 10 + 10 = 20 cm

Therefore, the new perimeter becomes 2 times the side of the square is doubled.

5. Ans: (b) Rs. 234

For fencing the rectangular field, we need to find the perimeter of the rectangle. Length of the rectangle = 34m

Breadth of the rectangle = 18m

Perimeter of the rectangle = 2 (Length + Breadth) = 2 (34 + 18) m = 2 × 52 m = 104 m

∴ Cost of fencing the field at the rate of Rs. 2.25 per meter = Rs. 104 × 2.25 = Rs. 234

6. Ans. (b) 50 sq cm.

Area of square = 10 x 10 = 100 sq cm. Area of triangle = 100 / 2 = 50 sq cm.

7. Ans. (a) 21 cm.

Side = 168 / 8 = 21 cm.

8. Ans: (d) 16 m

9. Ans. (a) Both A and R are true, and R is the correct explanation of A.

Perimeter = 5 + 6 + 7 = 18. The sum of sides (R) is the definition of perimeter.

10. Ans. (a) Both A and R are true, and R is the correct explanation of A.

Perimeter = 5 + 6 + 7 = 18. The sum of sides (R) is the definition of perimeter.

SECTION – B

11. Ans: Length of wire 20 m is folded in the form of rectangle

So the perimeter = 20 m

It can be written as 2 (L + B) = 20 m On further calculation L + B = 10 m

If the sides are positive integers in metres the possible dimensions are (1m, 9m), (2m, 8m), (3m, 7m), (4m, 6m)

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and (5m, 5m)
Hence, five rectangles can be formed using the given wire.

12. Ans: Dimensions of a photographs = 30 cm × 20 cm
So the required length of the wooden frame can be determined from the perimeter of the photograph = 2 (L + B)
By substituting the values = 2 (30 + 20) = 2 × 50 = 100 cm
Hence, the length of the wooden frame required to frame the picture is 100 cm.

13. Ans: It is given that area of a rectangle = 49 cm^2
Breadth of a rectangle = 2.8 cm
We know that, Area of a rectangle = L × B It can be written as
L = Area/B = 49/2.8 = 17.5 cm
Hence, the length of the rectangle is 17.5 cm.

14. Ans: It is given that Side of a square = 80 cm
So the area of the square = side × side
By substituting the values, Area of square = 80 × 80 = 6400 cm^2
We know that area of rectangle = area of square = 6400 cm^2
Breadth = 20 cm
Area of rectangle = L × B
It can be written as L = Area/B = 6400/20 = 320 cm
Hence, the length of the rectangle is 320 cm.

SECTION – C

15. Ans: Shikha runs around a square of side = 75 m
So the perimeter = 4 × 75 = 300 m
Priya runs around a rectangle having Length = 60 m and Breadth = 45 m
So the distance covered can be found from the perimeter = 2 (L + B) By substituting the values
Perimeter = 2 (60 + 45) = 2 × 105 = 210 m
Hence, Priya covers the smaller distance of 210 m.

16. Ans: The dimensions of garden are Length = 70 m and Breadth = 50 m So the perimeter = 2 (L + B)
By substituting the values
Perimeter = 2 (70 + 50) = 2 × 120 = 240 m Arvind fixes a post every 5 metres apart No. of posts required = 240/5 = 48
The length of each post = 2 m
So the total length of the pipe required = 48 × 2 = 96 m
Hence, the total length of the pipes he bought for the posts is 96 m.

17. Ans: Measure of marble tile = 15 cm × 20 cm Size of wall = 4 m × 6 m = 400 cm × 600 cm
So we get area of tile = 15 cm × 20 cm = 300 cm^2
Area of wall = 400 cm × 600 cm = 240000 cm^2
No. of tiles required to cover the wall = Area of wall/ Area of one tile
Substituting the values, we get
No. of tiles required to cover the wall = 240000/300 = 800 tiles
Hence, 800 tiles are required to cover a wall of size 4 m × 6 m.

SECTION – D

Questions 18 carry 5 marks each.

18. Ans. The given figure has three rectangles I, II and III. So the area of rectangle I = L × B = 3 × 1 = 3 cm^2 Area of rectangle II = L × B = 3 × 1 = 3 cm^2
Area of rectangle III = L × B = 3 × 1 = 3 cm^2
So the total area of the figure = Area of rectangle I + Area of rectangle II + Area of rectangle III
By substituting the values
Total area of the figure = 3 + 3 + 3 = 9 cm^2

SECTION E

19. **Case Study 1** Ans. (a)Length of the display board = 1 m 50 cm = 1.5 m Breadth of the display board = 1 m

∴ Perimeter of the one display board = 2 x (length + breadth)
= 2 × (1.5 m × 1 m) = 2 x 2.5 m = 5 m

(b) Number of boards will be framed using this strip = 100 / 5 = 20 strips

(c) Length of the aluminium strip required for the remaining boards = (120 -100)m = 20 m.
(d) Area of the one display board = length x breadth = 1.5m x 1 m = $1.5m^2$

20. Case Study 2:

Ans. (a) Total area of the entire park: 100 x 100 = 10000.
(b) Area of the road parallel to the length: 100 x 2 = 200 sq m.
(c) Area of the central square region where the two roads overlap: 2 x 2 = 4 sq m.
(d) Total area covered by the two roads: (200 + 200) - 4 = 396 sq m.

PRACTICE PAPER 18
CHAPTER 06 PERIMETER AND AREA (ANSWERS)
SECTION – A

1. Ans: (d) 126 cm

We have, Area of the rectangle = 650 cm2 and Breadth of the rectangle = 13 cm
As, length of the rectangle = Area/Breadth = 650/13 = 50 cm So, the perimeter of the rectangle = 2 × (length + breadth)
= 2 × (13 + 50) = 2 × 63 = 126 cm

2. Ans: (b) 60 m

We have, Area of the square = 225 m²
As, Area = (side)² = 225 m² = (15²) ⇒ side = 15m
So, the perimeter of the square = 4 × side = 4 × 15 = 60 m

3. Ans: (c) 4*A*

Let the length and breadth of the given rectangle be *l* and *b*, respectively. We have, $A = lb$.....(i)
Also, the length of the new rectangle, $l' = 2l$ and the breadth of the new rectangle, $b' = 2b$
Now, the area of the new rectangle = $l' \times\times b' = (2l) \times\times (2b) = 4lb = 4A$ [Using (i)]

4. The sides of a rectangle are in the ratio 5 : 4. If its perimeter is 72 cm then the length is
(a) 20 cm (b) 30 cm (c) 40 cm (d) none of these
Ans: (c) 40 cm

5. Ans: (b) 20.25 m^2

6. Ans. (c) ₹300

Area = Length x Width
Area = 10 m x 6 m = 60 sq m Total Cost
= Area x Rate
= 60 sq m x ₹5 / sq m = ₹300

7. Ans. (a) 80 m

Area = Length x Width
Length (l) = Area / Width = 300/ 10 = 30 m Now,
Perimeter = 2 * (Length + Width) Perimeter = 2 * (30 m + 10 m)
Perimeter = 2 * (40 m) = 80 m

8. Ans: (c) 495 m

9. Ans. (a) Both A and R are true, and R is the correct explanation of A.
The calculation is: Perimeter = 2 x (6 + 4) = 2 x (10) = 20 cm. The assertion is correct, and the reason provides the formula used to calculate it, making it the correct explanation.

10. Ans. (d) A is false, but R is true.
Area of Square = 2 x 2 = 4 sq cm Area of Rectangle = 3 x 1 = 3 sq cm
Since 4 sq cm is larger than 3 sq cm, the Assertion (A) is false. The Reason (R) correctly calculates both areas, so Reason (R) is true.

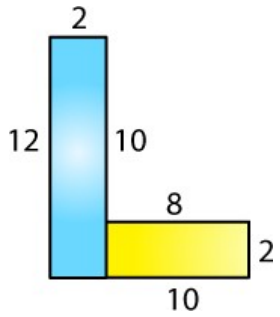
SECTION – B

11. Ans: Perimeter of the figure = AB + BC + CD + DE + EF + FG + GH + HA
= 10 + 10 + 20 + 30 + 20 + 20 + 10 + 20 = 140 m

12. Ans: Side of the square plot = 250 m
Area of the square plot = Side ×× Side = 250 × 250 = 62,500 m^2 Rate of levelling the plot = Rs. 2 per m^2
Cost of levelling the square plot = Rs. 62,500 × 2 = Rs. 1,25,000

13. Ans: Cost of fencing the rectangular field = Rs. 600 Rate of fencing the field = Rs. 7.50 per m
Therefore, perimeter of the field = Cost of fencing / Rate of fencing = 600 / 7.50 = 80 m Now, length of the field = 24 m
Therefore, breadth of the field = (Perimeter/2)− Length
= (80/2) − 24 = 16 m

14. Ans: Total area of the figure = 12 × 2 + 8 × 2 = 40 cm^2



SECTION – C

15. Ans: We have, Side of the square sheet cut out = 5 cm,
Length of the rectangular sheet = 9 cm and
Breadth of the rectangular sheet = 6 cm
Now, the area of the square sheet cut out = Side × Side = 5 × 5 = 25 cm^2 Also, the area of the rectangular sheet = Length × Breadth = 9 × 6 = 54 cm^2
So, the area of the sheet left over = Area of the rectangular sheet − Area of the square sheet cut out
= 54 − 25 = 29 cm^2
Hence, the area of the aluminium sheet left over is 29 cm2

16. Ans: It is given that Length of rectangle/Perimeter of rectangle = 1/3
⇒ l / (2l + 2b) = 1/3
After cross multiplying, we get:

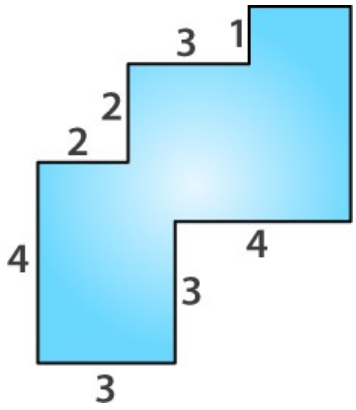
$$3l = 2l + 2b \Rightarrow l = 2b \Rightarrow \frac{l}{b} = \frac{2}{1}$$

Thus, the ratio of the length and the breadth is 2 : 1.

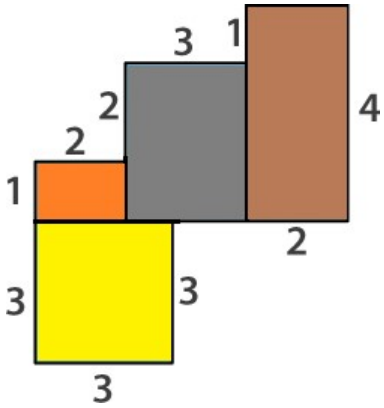
17. Ans: Dimensions of the rectangular land = 0.7 km ×× 0.5 km Perimeter of the rectangular land = 2 (Length + Breadth)
= 2 (0.7 + 0.5) km = 2 ××1.2 km = 2.4 km
This perimeter is equal to one row of wire required to fence the land.
Therefore, length of wire required to fence the land with four rows of wire = 4 ××2.4 km
= 9.6 km

SECTION – D

18. By splitting the following figures into rectangles, find their areas (The measures are given in centimetres).



Ans:



Area of yellow region = $3 \times 3 = 9$ cm^2
Area of orange region = $1 \times 2 = 2$ cm^2
Area of grey region = $3 \times 3 = 9$ cm^2
Area of brown region = $2 \times 4 = 8$ cm^2
Total area = $9 + 2 + 9 + 8 = 28$ cm^2
∴ The total area is 28 cm^2.

SECTION – E (Case Study Based Questions)

a. Case Study 1:

Ans. (a) The length of the fence required is the perimeter of the garden (excluding one side) which is equal to 20 m + 12 m + 12 m = 44 m.
Cost of fencing = Rs 150 × 44 = Rs 6,600.

(b) Side of the square = 10 m
Length of the wire = Perimeter of the square = 4 × side = 4 × 10 m = 40 m

(c) Length of the rectangle, l = 12 m. Let b be the breadth of the rectangle.
Perimeter of rectangle = Length of wire = 40 m
Perimeter of the rectangle = 2 (l + b)
Thus, $40 = 2(12 + b) \Rightarrow 12 + b = 20 \Rightarrow b = 20 - 12 = 8$ m
The breadth of the rectangle is 8 m.

(d) Area of the square = (side)² = 10 m × 10 m = 100 m²
Area of the rectangle = l × b = 12 m × 8 m = 96 m²
Difference = 100 m² - 96 m² = 4 m²

b. Case Study 2:

Ans: (a) Dimension of the tile = 10 cm × 12 cm
Dimension of the wall =3 m × 4 m
= 300 cm × 400 cm (Since, 1 m = 100 cm, so, 3 m = 300 cm and 4 m = 400 cm)
Area of the tile = 10 cm × 12 cm = 120 cm^2
(b) Area of the wall = 300 cm × 400 cm = 1,20,000 cm^2
(c) Number of tiles required to cover the wall = $\frac{Area\ of\ wall}{Area\ of\ one\ tile} = \frac{120000}{120}$ = 1,000 tiles

(d) Cost of tiles at the rate of Rs. 2 per tile = 2 × 1,000 = Rs. 2,000

PRACTICE PAPER 19

CHAPTER 07 FRACTIONS

(ANSWERS)

SECTION – A

1. Ans. **(c) 1/8**

Equal sharing among 8 children → 1/8 each.

2. Ans. **(b) 1/3**

3 equal pieces → each piece = 1/3.

3. Ans. **(b) 2/5**

Second mark = 2 parts out of 5.

4. Ans. **(b) $3\frac{1}{6}$**

Only option > 3.

5. Ans. **(c) 1/2**

3/6 simplifies to 1/2.

6. Ans. (a) 2/3

7. Ans. **(a) 3/4**

18 ÷ 6/24 ÷ 6 = 3/4

8. Ans. **(a) 3/4**

1/4 + 1/2 = 1/4 + 2/4 = 3/4.

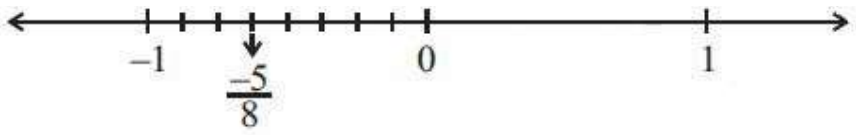
9. Ans. (a) Both A and R are true and R is the correct explanation of A.

10. **Ans.** (c) A is true but R is false.

SECTION – B

11. Ans. Divide the total weight of the guavas (1 kg) by the number of guavas (3).
Each guava weighs 1/3 kg.

12. Ans.



13. Ans. 11/4 = 2 . ¾

14. Ans. $\overline{2/3}$

Section - C

15. Check using equivalent fractions whether 4/6 and 6/9 are equivalent.
    Ans. 4/6 = 2/3 6/9 = 2/3 Yes, equivalent.

16. Add: 2/3 + 5/6 + 1/4 Ans. 21/12

17. Subtract using common denominators: 7/8 – 1/3. Ans. 7/8 – 1/3

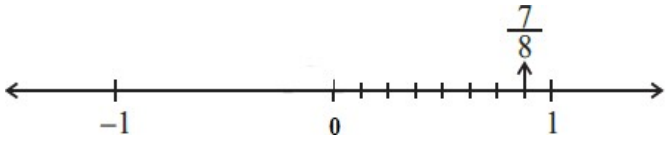
LCM = 24

7/8 = 21/24 and 1/3 = 8/24

∴ 7/8 – 1/3 = 21/24 – 8/24 = 13/24.

SECTION – D

18. Ans. (a) 1/8
    (b) 6/8
    (c) 3/4
    (d) Number line representation
    (e) Yes, 6/8 reduces to 3/4.



SECTION – E (Case Study Based Questions)

19. Case Study 1:

Ans. (a) 3/12 = 1/4
(b) 2/12 = 1/6
(c) Radha ate more.
(d) 1/4 on number line.



20. Case Study 2:

Ans. (a) 5/10 = 1/2
(b) 5/15 = 1/3
(c) First group gets more.
(d) 1/2 = 3/6 and 1/3 = 2/6 ∴ 1/2 > 1/3.

PRACTICE PAPER 20

CHAPTER 07 FRACTIONS

(ANSWERS)

SECTION – A

1. Ans. **(b) 1/4**

2 ÷ 8 = 1/4.

2. Ans. **(b) 1/4**

3. Ans. **(c) 7/10**

4. Ans. **(a) 5/12**

Convert:

5/12=0.416, 1/3≈0.333, 4/15=0.266, 2/9≈0.222 → greatest = 5/12.

5. Ans. **(b) 1/2**

6. Ans. **(a) 3/4**

45÷15 /60 ÷15 = 3/4.

7. Ans. **(c) 7/8**

3/4=6/8 → 6/8+1/8=7/8.

8. Ans, **(c) 7/6**

9. Ans. (a) Both A and R are true and R is the correct explanation of A.

10. Ans. (a) Both A and R are true and R is the correct explanation of A.

SECTION – B

11. Ans. 1 unit ÷ 6 = 1/6; 4×1/6 = 4/6 = 2/3.

12. Write 26/8 as a mixed number.

Ans. $\frac{26}{8} = 3\frac{2}{8} = 3\frac{1}{4}$

13. Ans. LCM(3,9)=9

1/3=3/9 → 3/9+2/9=5/9.

14. Ans. 84÷12/108 ÷12 = 7/9.

SECTION – C

15. Ans. 6/8=3/4;

9/12=3/4

Yes they are equivalent.

16. Add 3/5 + 2/3 + 7/15.

Ans. LCM = 15

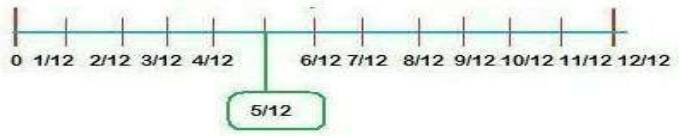
3/5=9/15

2/3=10/15
7/15=7/15
Sum=26/15 = $1\frac{11}{15}$.

17. Subtract: 5/6 – 2/9 using common denominator method.
Ans. LCM=18
5/6=15/18
2/9=4/18
Difference=11/18.

SECTION – D

18. Ans. (a) 1/12
(b) Mark on number line



(c) $\frac{15}{12} = 1\frac{3}{12} = 1\frac{1}{4}$
(d) 5/12=10/24 → yes they are equivalent
(e) 15/12=1.25; 11/12≈0.92 → yes 15/12 is greater.

SECTION – E (Case Study Based Questions)

19. Case Study 1:

Ans. (c) 3/4
(c) 6/8 (any one relevant equivalent fraction)
(c) Number line



(c) No, 3/4 < 1.

20. Case Study 2:

Ans. (a) 5/15 = 1/3
(a) 5/20 = 1/4
(a) Group 1
(d) 1/3 = 4/12 and 1/4 = 3/12
∴ 1/3 > 1/4.

PRACTICE PAPER 21

CHAPTER 07 FRACTIONS

(ANSWERS)

SECTION – A

1. Ans: (b) 1/3
   One whole divided equally among 3 children gives one-third to each.

2. Ans: (c) 1/8
   One whole divided into 8 equal parts gives 1/8.

3. Ans: (a) 4/8
   4/8 lies exactly between 3/8 and 5/8.

4. Mixed form of 35/6 is—
   Explanation: 35 ÷ 6 = 5 remainder 5 → $5\frac{5}{6}$

5. Ans: (a) 2/3
   Divide numerator and denominator by 15.

6. Ans: (b) 4/14
   Multiply numerator and denominator by 2.

7. 1/6
   Ans: (b) 3/6 = 1/2
   1/3 = 2/6 → 1/6 + 2/6 = 3/6.

8. Ans: (d) 5/10
   1/5 = 2/10 → 7/10 – 2/10 = 5/10

9. **Ans.**(a) Both A and R are true and R is the correct explanation of A.

10. Ans. (c) A is true but R is false.

SECTION – B

11. Represent 2/7 on a number line.
   Ans: Divide the segment from 0 to 1 into 7 equal parts and mark the second point.

12. Convert 17/3 into a mixed fraction.
   Ans: 17 ÷ 3 = 5 remainder 2 → $\mathbf{5\frac{2}{3}}$

13. Add: 3/8 + 1/4
   Ans: 1/4 = 2/8 → Sum = 5/8

14. Reduce 96/120 to simplest form.
   Ans: Divide both numerator and denominator by 24 → **4/5**

SECTION – C

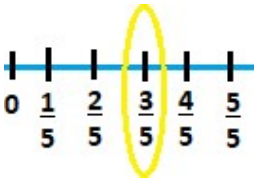
15. Check if 4/10 and 6/15 are equivalent.
Ans: 4/10 = 2/5
6/15 = 2/5
∴ Yes, they are Equivalent.

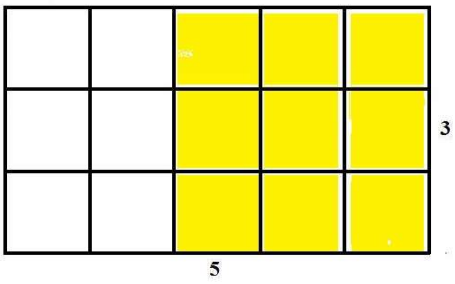
16. Add: 4/9 + 5/12 + 1/6
Ans: LCM=36
4/9=16/36
5/12=15/36
1/6=6/36
Sum=37/36 = $1\frac{1}{36}$.

17. Subtract: 11/12 – 5/18
Ans: LCM=36
11/12=33/36
5/18=10/36
Difference=23/36.

SECTION – D

18. Ans. (a) 1/15
(b) 9/15
(c) 3/5
(d) Number line





(e) Yes, 9/15 simplifies to 3/5.

SECTION – E (Case Study Based Questions)

19. Case Study 1:

Ans. (a) 5/12
(b) 7/12
(c) B worked more
(d) Equivalent fraction of 5/12 = 10/24.
Equivalent fraction of 7/12 = 14/24

20. Case Study 2:

Ans. (a) 10/12
(b) 9/12
(c) Customer with 5/6
(d) Difference = 1/12.

PRACTICE PAPER 22

CHAPTER 08 PLAYING WITH CONSTRUCTIONS

(ANSWERS)

SECTION – A

1. **Ans:** (b)
   A perpendicular must be drawn at one end to begin square construction.

2. **Ans.:** (c)
   Fixed compass opening is necessary for accurate copying.

3. **Ans:** (c)
   Without right angles, the figure cannot be a square or rectangle.

4. **Ans:** (b)
   Equal intervals and perpendiculars form equal squares.

5. **Ans:** (c)
   Diagonals intersect at the centre of the square.

6. **Ans:** (b)
   Right angles are necessary for rectangles.

7. Ans (b)
   Perpendiculars ensure 90° angles.

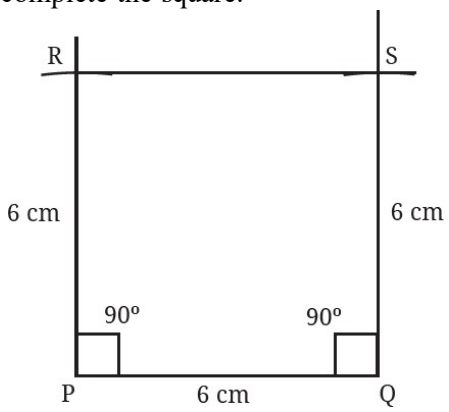
8. **Ans:** (b)
   Equal lengths and perpendiculars form equal squares.

9. **Ans:** (a) Both A and R are true and R is the correct explanation of A. This property is used to draw a circle inside a square.

10. **Ans:** (a) Both A and R are true and R is the correct explanation of A.

SECTION – B

11. Construct a square when one side is given as 6 cm.
    Ans. **Steps of Construction:**
    1. Draw the given side PQ = 6cm.
    2. Construct perpendiculars at both ends.
    3. Cut equal lengths of 6 cm and complete the square.



12. Ans: (b)

13. A robot draws AB and perpendicular at A but cuts unequal length. Identify mistake and correction.

Ans:

Mistake: Unequal compass length used.
Correction: Use fixed compass opening.

14. Write the steps to extend one square into a strip of squares.

Ans:

- Mark equal lengths along one side.
- Draw perpendiculars at the marks.

15. Write the steps to verify a constructed square.

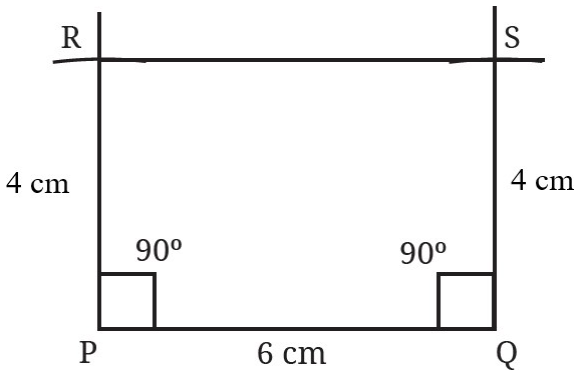
Ans:

- Check all sides are equal.
- Check all angles are right angles.

SECTION – C

16. Construct a rectangle when its length is 6 cm and breadth is 4 cm given.

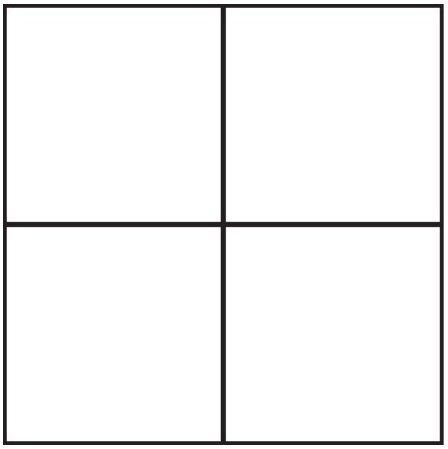
Ans. **Steps of Constructions**



- Draw the given length.
- Construct perpendiculars at both ends.
- Mark the given breadth and complete the rectangle.

17. Construct a square and divide it into four equal smaller squares.

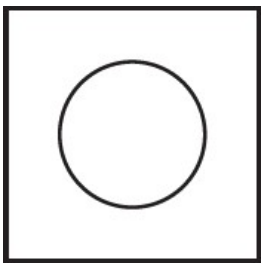
Ans (Steps):



Draw a square using ruler and compass.
Draw both diagonals to locate the centre.
Draw perpendiculars through the centre to divide it into four equal squares.

18. Construct a square and draw a circle inside it.

Ans (Steps):



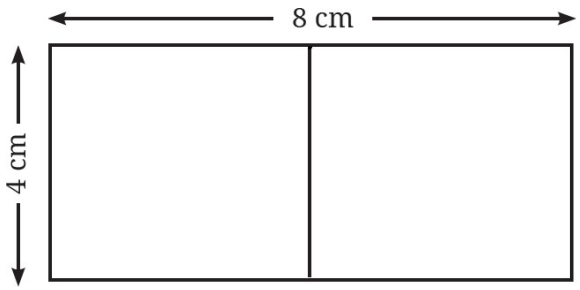
- Draw a square.
- Draw diagonals to locate the centre.
- Fix the compass at the centre and draw the circle.

SECTION – D

19. Construct a rectangle 8cm by 4cm and divide it into equal squares.

Ans. **Steps of Constructions**

1. Draw the given length.
2. Construct perpendiculars at both ends.
3. Mark the breadth and complete the rectangle.
4. Mark equal lengths along one side.
5. Draw perpendiculars to form squares.



SECTION – E (Case Study Based Questions.)

20. Case Study 1:

Ans: (a) Drawing perpendiculars at both ends

(b) Cutting equal lengths using a compass

(c) Drawing both diagonals

(d) Fixing compass at the centre with fixed opening

21. *Case Study 2:*

Ans: (a) Drawing perpendiculars at each mark

(b) By constructing perpendicular lines

(c) By repeating marking and perpendicular construction

(d) By checking equal sides and right angles

PRACTICE PAPER 23

CHAPTER 08 PLAYING WITH CONSTRUCTIONS

(ANSWERS)

SECTION – A

1. **Ans:** (b)
   A perpendicular is required to create right angles.

2. **Ans:** (b)
   Fixed compass opening ensures equal length.

3. **Ans:** (c)
   Unequal sides prevent square or rectangle formation.

4. **Ans:** (b)

5. **Ans:** (c)

6. **Ans:** (b)

7. **Ans:** (b)

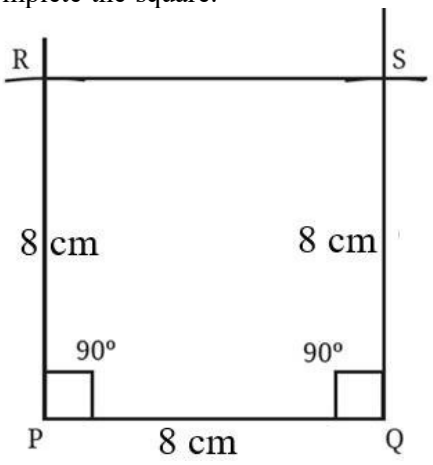
8. **Ans:** (b)

9. **Ans:** (a) Both A and R are true and R is the correct explanation of A.

10. **Ans:** (a) Both A and R are true and R is the correct explanation of A.

SECTION – B

11. Construct a square when one side is given as 8 cm.
    Ans. **Steps of Construction:**
    1. Draw the given side PQ = 8cm.
    2. Construct perpendiculars at both ends.
    3. Cut equal lengths of 8 cm and complete the square.



12. Write the steps of Constructions to construct a line segment AB of length 6 cm and copy it using compass.

Ans.

1. Draw AB = 6 cm
2. Open compass equal to AB
3. Mark point C
4. Draw CD equal to AB

CD = 6 cm

13. Write the steps of Constructions to construct perpendicular line at point A on line segment AB.

Ans.

1. Draw line AB
2. Place compass at A
3. Draw arcs on both sides
4. Join arc intersection point to A

14. Write the steps to verify a constructed rectangle.

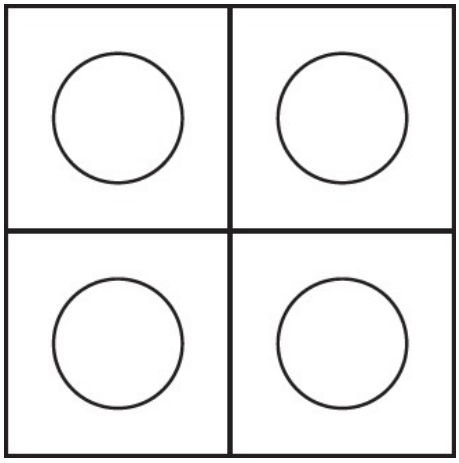
Ans:

• Check all angles are right angles.
• Check opposite sides are equal.

SECTION – C

15. Construct a square, divide it into four equal smaller squares and then construct four circles inside each square.

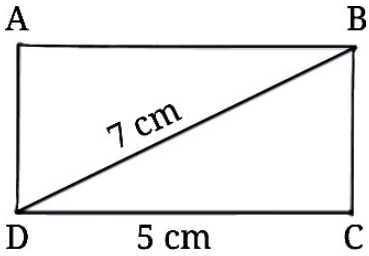
Ans (Steps):



- Draw a square.
- Draw both diagonals to locate the centre.
- Draw perpendiculars through the centre.
- Draw diagonals in each small square to locate the centre.
- Draw four circles with compass fixed at the centre.

16. Construct a rectangle where one of its sides is 5 cm and the length of a diagonal is 7 cm.

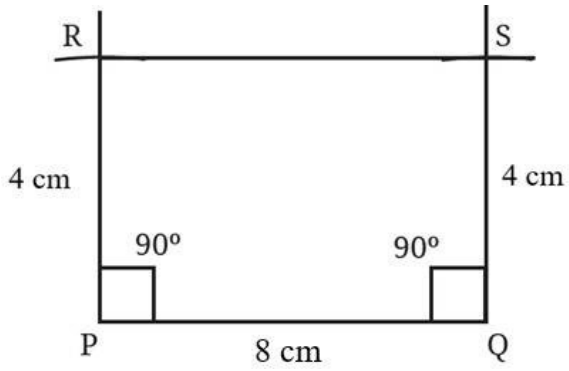
Ans (Steps):



- Draw line segment DC = 5 cm.
- Construct a 90-degree angle at A to make a perpendicular line.
- Place the compass at D, open to 7 cm, and draw an arc intersecting the perpendicular line at B
- Set the compass width to the length of BC and draw an arc from D.
- Change the compass width to 5 cm and draw an arc from B intersecting the previous arc at point A.
- Join AD and CD to complete rectangle ABCD. Join BD

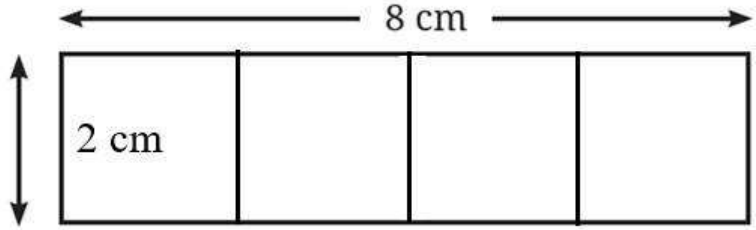
17. Construct a rectangle when its length is 8 cm and breadth is 4 cm given.
Ans. **Steps of Constructions**

- Draw the given length.
- Construct perpendiculars at both ends.
- Mark the given breadth and complete the rectangle.



SECTION – D

18. Construct a rectangle 8cm by 2cm and divide it into equal squares.
Ans. **Steps of Constructions**
1. Draw the given length.
2. Construct perpendiculars at both ends.
3. Mark the breadth and complete the rectangle.
4. Mark equal lengths along one side.
5. Draw perpendiculars to form squares.



SECTION – E (Case Study Based Questions)

19. Ans: (a) Compass
(b) To make right angles
(c) Square
(d) Four

20. *Case Study 2:*
Ans: (a) Rectangle
(b) Four
(c) Compass
(d) Perpendicular construction

PRACTICE PAPER 24
CHAPTER 09 SYMMETRY
(ANSWERS)
SECTION – A

1. Ans: (b)
Square ⇒ 360° ÷ 4 = 90° ⇒ overlaps 4 times.

2. Ans: (b)
Vertical fold produces mirror halves.

3. Ans: (c)
360° ÷ 6 = 60°.

4. Ans: (a)
Windmill rotates but cannot be folded into mirror halves.

5. Ans: (b)
360° ÷ 5 = 72°.

6. Ans: (a)
Only one mirror line divides the isosceles triangle equally.

7. Ans: (c)
360° ÷ 36° = 10 ⇒ decagon.

8. Ans: (d)
Full rotation restores original position.

9. Assertion (A): A square has four lines of symmetry.
Reason (R): Folding along diagonal or central lines produces mirror halves.
Ans: (a)
Each fold line divides square into mirror halves.

10. Assertion (A): A scalene triangle has no line of symmetry.
Reason (R): All sides and angles are unequal.
Ans: (a)
Unequal sides prevent mirror symmetry.

SECTION – B

11. Ans: (a) Six
(b) Line joining opposite vertices through centre

12. Ans: (a) Four
(b) 90°

13. Ans: (a) Three
(b) 120°

14. Ans: (a) Two
(b) Two

SECTION – C

15. A regular octagon
is drawn.
(a) **Ans:** (a) Eight
(b) Eight
(c) 45°

16. A square sheet is folded along both diagonals.
(a) **Ans:** (a) Two
(b) Four
(c) Four

17. A ceiling fan has three identical blades.
(a) **Ans:** (a) Central point
(b) Three
(c) 120°

SECTION – D

18. A regular polygon has 8 equal sides.
(a) **Ans:** (a) Octagon
(b) 8
(c) 8
(d) 45°
(e) Decorative circular pattern

SECTION – E (Case Study Based Questions)

19. *Case Study 1: School Hall Floor Design*
(a) **Ans:** (a) Ten
(b) Ten
(c) 36°
(d) Ten

20. *Case Study 2:*
(a) **Ans:** (a) Rotational symmetry
(b) Twelve
(c) 30°
(d) No

PRACTICE PAPER 25

CHAPTER 09 SYMMETRY

(ANSWERS)

SECTION – A

1. Ans: (d)
360° ÷ 8 = 45°.

2. Ans: (b)
Vertical centre line divides rectangle into mirror halves.

3. Ans: (b)
Regular hexagon → 360° ÷ 6 = 60° → order 6.

4. Ans: (a)
Windmill rotates but cannot be folded to mirror halves.

5. Ans: (b)
360° ÷ 10 = 36°.

6. Ans: (a)
Only one mirror line divides the isosceles triangle equally.

Ans: (a)

7. 360° ÷ 72° = 5 → regular pentagon

8. Ans: (d)
Full rotation restores the original position.

9. Assertion (A): A scalene triangle has no line of symmetry.
Reason (R): All sides and angles are unequal.
Ans: (a) Both A and R are true and R is the correct explanation of A.
Unequal sides prevent mirror symmetry.

10. Assertion (A): A square has four lines of symmetry.
Reason (R): Folding along any diagonal or centre line produces two mirror halves.
Ans: (a) Both A and R are true and R is the correct explanation of A.
Each fold line divides the square into mirror halves.

SECTION – B

11. Ans: (a) Six
(b) Line joining opposite vertices through the centre

12. Ans: (a) Four
(b) 90°

13. Ans: (a) Three
(b) 120°

14. Ans: (a) Two
(b) Two

SECTION – C

15. A regular octagon is drawn.
(a) Write its number of sides→ 8
(b) Write its number of lines of symmetry→ 8
(c) Write its smallest angle of rotation→ 45

16. A square sheet is folded along both diagonals.
(a) Write number of folds → 2
(b) Write number of equal regions formed → 4
(c) Write number of mirror images of a punched hole →

17. A ceiling fan has eight identical blades.
(a) Write the centre of rotation -> Central Point
(b) Write the order of rotational symmetry→ 8
(c) Write the smallest angle of rotation → 45

SECTION – D

18. A regular polygon has 10 equal sides.
(a) Write its name→ Regular Decagon
(b) Write number of lines of symmetry → 10
(c) Write order of rotational symmetry → 10
(d) Write smallest angle of rotation → 36,
(e) Write one real-life object showing similar symmetry→ Ferris Wheel

SECTION – E (Case Study Based Questions)

19. *Case Study 1: School Hall Floor Design*

Based on the above, answer the following questions

(a) Write the number of sides of the hexagon→6
(b) Write the order of rotational symmetry → 6
(c) Write the smallest angle of rotation → 60
(d) Write the number of lines of symmetry → 6

20. *Case Study 2:*

Based on the above, answer the following questions

(a) Write the type of symmetry → Rotational Wheel
(b) Write the order of rotational symmetry → 12
(c) Write the smallest angle of rotation → 30
(d) Write whether it has any line of symmetry → NO.