

GRADE: 7

SUBJECT: Mathematics LESSON: Ratio and Proportions DURATION: 2½ hrs

MAX MARKS: 80

Instructions:

1. The time given at the head of this Paper is the time allowed for writing the answers.
2. You will not be allowed to write during the first 10 minutes. Use this time to read the question paper carefully.
3. Attempt **all questions from Section A** and **any four questions from Section B**.
4. All working, including rough work, must be clearly shown.
5. Omission of essential working will result in loss of marks.

SECTION A ($4 \times 10 = 40$ marks)

(Answer all questions)

1. Choose the correct option:

a) The ratio of 10 to 50 is:

- (i) 1:5
- (ii) 2:5
- (iii) 5:1
- (iv) 10:50

b) The simplest form of the ratio 18:24 is:

- (i) 3:4
- (ii) 2:3
- (iii) 4:3
- (iv) 6:8

c) If $A:B = 3:5$ and $B:C = 4:7$, then $A:C$ is:

- (i) 12:35
- (ii) 5:7
- (iii) 3:7
- (iv) 4:5

d) The proportion that represents $8:16 = 4:8$ is called:

- (i) Direct proportion
- (ii) Equivalent ratio
- (iii) Cross multiplication
- (iv) Fourth proportional

2. Solve the following:

a) Express the ratio 150 cm to 2 meters in its simplest form.

b) Convert the following into ratios in the simplest form:

- 25 minutes to 45 seconds
- 3 kg to 500 grams

c) Find the missing value in the proportion:

- $9:x = 3:5$

3. Solve the following equations:

a) The ratio of boys to girls in a school is 5:6. If there are 210 boys, find the number of girls in the school.

b) Find the fourth proportional to 7, 21, and 9.

c) A worker earns ₹1,200 per month. He spends ₹900 on his monthly expenses. Find the ratio of:

- His savings to his earnings
- His expenses to his earnings

4. State whether the following statements are TRUE or FALSE:

a) The ratio of 3:5 is equal to 5:3.

b) A proportion is an equation stating that two ratios are equal.

c) The number of students in a class and the salary of a teacher can be expressed as a ratio.

d) If two numbers are in the ratio 4:5, their sum is always a multiple of 9.

5. Solve the following problems:

- a) A father divides ₹5,400 among his three children in the ratio 4:5:7. Find the share of each child.
- b) A bag contains red, blue, and green balls in the ratio 3:2:4. If there are 54 balls in total, find the number of each color ball.
- c) The cost of 12 pens is ₹360. What is the cost of 7 pens?

SECTION B ($4 \times 10 = 40$ marks)

(Answer any four questions)

6. Graph-Based Question:

The table below shows the number of students in different sections of a school:

Section	No. of Students
A	25
B	30
C	40

- a) Draw a **bar graph** representing this data.
- b) Find the ratio of students in Section A to students in Section B.

7. Ratio and Proportion Calculations:

- a) Divide ₹780 among three people in the ratio 2:3:5.
- b) A man walks 7 km in 2 hours. At the same rate, how far will he walk in 5 hours?
- c) The weight of two objects is in the ratio 3:4. If the lighter object weighs 18 kg, find the weight of the heavier object.

8. Real-Life Application Problems:

- a) A recipe requires ingredients in the ratio 2:3:5. If 300 grams of the second ingredient is used, how much of the first and third ingredients are required?
- b) The speed of a train is 90 km/h. If it takes 4 hours to reach its destination, what is the total distance traveled?
- c) A rope of length 150 m is cut into two parts in the ratio 3:2. Find the length of each part.

9. Compound Ratios & Proportions:

- a) The ages of three people are in the ratio 5:6:7. If the sum of their ages is 108 years, find their individual ages.
- b) The population of two towns is in the ratio 3:5. If the total population is 32,000, find the population of each town.
- c) A certain sum of money is divided among three people in the ratio 2:5:7. If the largest share is ₹2800, find the total amount.

10. Higher Order Thinking Skills (HOTS):

- a) A father's age is 4 times the age of his son. In 6 years, their ages will be in the ratio 5:2. Find their present ages.
- b) Two numbers are in the ratio 7:9. If 4 is added to each number, the ratio becomes 5:6. Find the numbers.
- c) The speed of two cyclists is in the ratio 3:4. If the first cyclist travels 24 km, how far does the second cyclist travel in the same time?

END OF THE QUESTION PAPER