Q1. Which of the following is not true:–
(a) $\frac{2}{3}+\frac{5}{4}=\frac{5}{4}+\frac{2}{3}$
(b) $\frac{2}{3}-\frac{5}{4}=\frac{5}{4}-\frac{2}{3}$
(c) $\frac{2}{3} \times \frac{5}{4}=\frac{5}{4} \times \frac{2}{3}$
(d) $\frac{2}{3}+\frac{5}{4}=\frac{2}{3}+\frac{4}{5}$

Q2. Multiplicative inverse of $\frac{0}{1}$ is
(a) 1 (b) -1 (c) 0 (d) not defined

Q3. A number which can be expressed as $\frac{p}{q}$ where $p$ and $q$ are integers and $q\neq 0$ is
(a) natural number (b) whole number
(c) integer (d) rational number

Q4. A number of the form $\frac{p}{q}$ is said to be a rational number if
(a) $p$ and $q$ are integers (b) $p$ and $q$ are integers and $q\neq 0$
(c) $p$ and $q$ are integers and $p\neq 0$ (d) $p$ and $q$ are integers and $p\neq 0$ or $q$ not equal to 0

Q5. Which of the following is not true?
(a) rational numbers are closed under addition (b) rational numbers are closed under subtraction
(c) rational numbers are closed under multiplication (d) rational numbers are closed under division

Q6. Zero (0) is:
(a) the identity for addition of rational numbers (b) the identity for subtraction of rational numbers
(c) the identity for multiplication of rational numbers (d) the identity for division of rational numbers

Q7. One (1) is
(a) the identity for addition of rational numbers (b) the identity for subtraction of rational numbers
(c) the identity for multiplication of rational numbers (d) the identity for division of rational numbers

Q8. The additive inverse of $-\frac{7}{19}$ is
(a) $-\frac{7}{19}$ (b) $\frac{7}{19}$ (c) $\frac{19}{7}$ (d) $-\frac{19}{7}$

Q9. Multiplicative inverse of negative rational number is
(a) a positive rational number (b) a negative rational number
(c) 0 (d) 1

Q10. To get the product 1, we should multiply $\frac{8}{21}$ by
(a) $\frac{8}{21}$ (b) $-\frac{8}{21}$ (c) $\frac{21}{8}$ (d) $-\frac{21}{8}$
Q11. \( -x \) is same as
(a) \(-x\)  (b) \(x\)  (c) \(1/x\)  (d) \(-1/x\)

Q12. The multiplicative inverse of \(-1\) 1/7 is
(a) 8/7  (b) -8/7  (c) 7/8  (d) 7/8

Q13. The reciprocal of 1 is
(a) 1  (b) -1  (c) 0  (d) not defined

Q14. The reciprocal of 0 is
(a) 1  (b) -1  (c) 0  (d) not defined

Q15. Fill in the blanks:
1. The equivalent of 5/7, whose numerator is 45 is ________.
2. The equivalent rational number of 7/9, whose denominator is 45 is ____.
3. The reciprocal of positive rational number is ________.
4. The reciprocal of a negative rational number is ________.
5. Zero has ________ reciprocal.
6. The numbers ________ and ________ are their own reciprocal.
7. The product of a non-zero rational number and its reciprocal is ____.
8. If \(x=1/3\) and \(y=6/7\) then \(xy-y/x=\) ____________.

Q16. Using appropriate properties, find
a) 2/3 -5/7+7/3+2/3 -2/7  b) 4/7+4/9+3/7+13/9  c) -5+7/10+3/7+-3+5/14+4/5  d) (3/5 x 6) + (5 x 6)


i) \( \frac{3}{5} \times \frac{8}{9-40} \)  j) -4/5 x 3/7 x 15/16 x -14/9  k) -5/4 x (8/5+16)

l) 1/2 x 1/4 + -7/18 x 15/7 - 1/4 x 1/3  m) 3/7 + 6/11 + -8/21 + 5/22  n) 5/3 x 11/3 + 11/13 x 6/3

o) 7/12 x -3/5 + -5/3 x 7/12  p) 2/5 x -3/7 - -5/3 x 7/12  q) 2/5 x -3/7 - 1/14 + -3/7 x 8/5

r) -3/2 + 5/4 + -7/4  s) 9/16 x 4/12 -2/8 + 9/16 x 2/9  t) 1/2 x 1/4 + -7/18 x 15/7 - 4 x 1/3

Q17) Write five rational numbers between
a) 2/5 and 3/4  b) -1/2 and -1/3

18) Verify \(-x\)=\(x\), for
(a) \(x=3/5\)  (b) \(x=-7/9\)  (c) \(x=13/-15\)
UNDERSTANDING QUADRILATERALS

1) Two adjacent angles of a parallelogram are in the ratio 4:5. Find their measures.
2) The ratio of exterior angle to interior angle of a regular polygon is 1:4. Find the number of sides of the polygon.
3) RICE is a rhombus. Find \(x, y, z\). Justify your findings. Hence, find the perimeter of the rhombus.

\[\begin{align*}
OI &= x + 2, \quad OR = y + x \\
ER &= z, \quad OC = 5, \quad OC = 12
\end{align*}\]

4) A playground in the town is in the form of a kite. The perimeter is 106 metres. If one of its sides is 23 metres, what are the lengths of other three sides?

5) Find the values of \(x\) and \(y\) in the following parallelogram.
6) Find the measure of each angle of a regular octagon.
7) Diagonals AC and BD of a rectangle ABCD intersect each other at O. If \(OA = 5\) cm, find AC and BD.
8) In a parallelogram ABCD measure of angle A is three times the measure of angle B. Find all the four angles.
9) The number of sides of a regular polygon whose each exterior angle has a measure of 45°.
10) Find the diagonal of a rectangle whose sides are 12 cm and 5 cm.
11) In a parallelogram PQRS the lengths of the sides \(PS = (3z - 1)\) and \(RQ = (2z + 2)\) cm. Find the value of \(z\).
12) Diagonals of a rhombus are of length 10 cm and 24 cm. Find its perimeter.
13) Three angles of a quadrilateral are equal. Fourth angle is of measure 120°. What is the measure of equal angles?

14) In the figure, find the value of \(x\).

15) Three angles of a quadrilateral are equal. Fourth angle is of measure 120°. What is the measure of equal angles?
1. The cube of 100 will have _______ zeroes.

2. The cube of 0.3 is ________.

3. The least number to be multiplied with 9 to make it a perfect cube is ________.

4. The least number by which 72 be multiplied to make it a perfect cube is ________.

5. The least number by which 72 be divided to make it a perfect cube is ________.

6. Cube of a number ending in 7 will end in the digit ________.

7. The one’s digit of the cube of 23 is ________.

8. Number of digits in the cube root of 140608 is ________.

9. Find :-
   a) \( \sqrt[3]{32.768} \)  
   b) \( \sqrt[3]{1000} + \sqrt[3]{91125} \)
   c) \( \sqrt[3]{27000 \times 343} \)  
   d) \( \sqrt[3]{-64} \div (-729) \)

10. Which of the following numbers are not a perfect cube?
    (a) 243  (b) 216  (c) 392  (d) 2744  (e) 8640

11. Using prime factorization, find which of the following are perfect cubes.
    (a) 128  (b) 343  (c) 729  (d) 1331  (e) 19683  (f) 2197

12. Using prime factorization, find the cube root of
    (a) 5832  (b) 74088  (c) 13824  (d) 27000

13. Find the one’s digit of the cubes of the following numbers.
    a) 48  b) 23  c) 0.4  d) 1.7  e) 3.05

14. Find the cube root of 0.001728

15. Find the cube of \( \frac{-3}{5} \)

16. If \( \sqrt[3]{46656} = 36 \), find \( \sqrt[3]{46.656} + \sqrt[3]{0.046656} \)
17. Is 68600 a perfect cube? If not, find the smallest number by which it should be divided to get a perfect cube.

18. Is 53240 is a perfect cube? If not, then by which smallest number should 53240 be divided so that the quotient is a perfect cube?

19. By what smallest number should 3600 be multiplied so that the quotient is a perfect cube. Also find the cube root of the quotient.

20. If one side of a cube is 15cm in length, find its volume.

21. Find the length of each side of a cube, if its volume is 512 cm³.

22. Three numbers are in the ratio 1:2:3 and the sum of their cubes is 4500. Find the numbers.

23. Athul has a cuboidal box of sides 3 cm, 7 cm, 7 cm. How many such boxes will he need to form a perfect cube?

24. A box with volume 4096 cm³ is filled with cubes of edges 4 cm. How many cubes are there in the box?

25. Adil made a cuboid of plasticine of sides 5 cm, 9 cm, 5 cm. How many such cuboids will he need to form a cube?
1. **CHOOSE THE CORRECT ANSWER**:

1. Square of an odd number is:
   a) an odd number  b) an even number  c) either an odd number or an even number  d) none of these

2. Which of the following is not a perfect square:
   a) 441   b) 324   c) 253   d) 625

3. Which of the following cannot be a digit in unit place of a perfect square.
   a) 1   b) 5   c) 7   d) 0

4. What will be the unit digit of the square of 234567
   a) 4   b) 6   c) 9   d) 0

5. How many non-perfect square numbers lie between the squares of 15 and 16?
   a) 31   b) 32   c) 30   d) 35

6. Find the least number by which 500 must be multiplied to make it a perfect square
   a) 2   b) 3   c) 4   d) 5

7. The square root of 1.44 is --------
   a) 1.22   b) 12.2   c) 1.2   d) 1.12

8. Area of a square plot is 729 m². The side of the square is:
   a) 33m   b) 37m   c) 27m   d) 23m

9. The number of zeros in the square of 400 will be --------
   a) 2   b) 1   c) 3   d) 4

10. What could be the possible ‘ones’s’ digits of the square root of 3481
    a) 2 or 8   b) 3 or 7   c) 1 or 9   d) 5

11. The number of digits in the square root of 3230785 is
    a) 4   b) 3   c) 5   d) 1

**II. SOLVE THE FOLLOWING**:

1. Find the square of the following numbers without actual multiplication:
   a) 19   b) 23   c) 45   d) 52

2. Find the square root of the following numbers by prime factorization method:
   a) 4225   b) 4489   c) 8281   d) 5625   e) 1296   f) 7056

3. Find the square root of the following numbers by division method:
   a) 1849   b) 6561   c) 8649   d) 7396   e) 6889   f) 12996

4. Find the square root of the following decimal numbers:
   a) 38.44   b) 151.29   c) 53.59   d) 156.25   e) 104.04   f) 92.16
5. Find the least perfect square number which is divisible by each of the numbers 4, 5 and 10.

6. Find the least perfect square number which is divisible by each of the numbers 8, 12, 15 and 20.

7. The sides of a rectangular field are 80m and 18m respectively. Find the length of the diagonal.

8. Find the smallest number by which it must be multiplied so as to get a perfect square. Also find the sq. root of the perfect square.
   a) 9075  b) 1250  c) 7350  d) 1300  e) 2475

11. Find the smallest number by which it must be divided so as to make it a perfect square. Also find the square root of the number so obtained.
   a) 1250  b) 9075  c) 3267  d) 2925  e) 600

12. Find the least number which must be subtracted from 984 to make it a perfect square.

13. Find the least number which must be subtracted from 7230 to make it a perfect square. Find the square root of the number so obtained.

14. Find the least number of four digit which is a perfect square.

15. Find the least number which must be added to 9213 to make it a perfect square. Find the square root of the number so obtained.

16. Find the greatest number of five digit, which is a perfect square.

17. The students of a class arranged a picnic. Each student contributed as many rupees as the number of students in the class. If the total contribution is Rs. 1156, find the strength of the class.

18. 4096 soldiers are arranged in an auditorium in such a manner that there are as many soldiers in a row as there are rows in the auditorium. How many rows are there in the auditorium?

19. There are certain number of rows of trees in a garden. The number of trees in each row is twice the number of rows. If the number of trees in the garden is 1250, find the number of rows in the garden.

20. A gardener has 1500 plants. He wants to plant these in such a way that the number of rows and the number of columns remain same. Find the minimum number of plants he needs more for this.

21. An army commander arranged his soldiers, who were 8289 in number in the form of a square. How many soldiers were left out after the arrangement?

22. A yoga instructor wants to arrange maximum possible number of 6000 students in a ground so that the number of rows is same as the number of columns. How many rows will be there if 71 students were left out after the arrangement?
1. Construct a rectangle of adjacent sides 3.5 cm and 4.2 cm.

2. Construct a square of side 6.2 cm.

3. Construct a rhombus whose diagonals are 24cm and 10 cm respectively.

4. Construct a quadrilateral 'KING' where KI= 5.5 cm, IN= 6 cm, \( \angle K=60^0 \), \( \angle I= 100^0 \) and \( \angle G = 95^0 \).

5. Construct a parallelogram ABCD where AB= 4.5 cm, BC= 7 cm and \( \angle B = 65^0 \).

6. Construct a square of side 4.4 cm.

7. Construct a rhombus LIKE where LK= 5.8 cm and IE = 6.7 cm.

8. Can you draw a parallelogram BATS where BA=5 cm, AT= 6 cm and AS= 6.5 cm. Justify your answer.

9. Construct a quadrilateral PQRS where PQ=4.3 cm, QR= 5.7 cm, RS= 5.3 cm, PS= 5.8 cm and PR= 7cm.

10. Construct a quadrilateral TRUE where TR= 4.8 cm, RU= 5.2cm, UE= 3.9cm, ET= 5.8 cm, RE= 7.7 cm.

11. Construct a square of perimeter 24 cm.
1. If x and y are inversely proportional then _____ = k where k is positive constant  
2. Side of a rhombus and its perimeter are in _____ proportion.  
3. Both x and y are said to vary _______ with each other if for some positive number k, xy = k.  
4. x and y are said to vary directly with each other if for some positive number k, _____ = k  
5. Two quantities are said to vary ______ with each other if they increase (decrease) together in such a manner that the ratio of their corresponding values remains constant.  
6. When the speed remains constant, the distance travelled is ______ proportional to the time  
7. The perimeter of a circle and its diameter vary _______ with each other.  
8. If x varies inversely as y and x = 4 when y = 6, then when x = 3 the value of y is _______.  
9. which of the following vary directly and which vary inversely with each other and which are neither of the two?  
   (i) The time taken by a train to cover a fixed distance and the speed of the train.  
   (ii) The number of people working and the time to complete a given work.  
   (iii) The number of people working and the quantity of work.  
   (iv) The height of a tree and the number of years  
10. If x varies inversely as y and x = 20 when y = 600, find y when x = 400  
11. The variable x varies directly as y and x = 80 when y is 160. What is y when x is 64?  
12. In a camp, there is enough flour for 300 persons for 42 days. How long will the flour last if 20 more persons join the camp?
13. A contractor undertook a contract to complete a part of a stadium in 9 months with a team of 560 persons. Later on, it was required to complete the job in 5 months. How many extra persons should he employ to complete the work?

14. If a deposit of Rs 2,000 earns an interest of Rs 500 in 3 years, how much interest would a deposit of Rs 36,000 earn in 3 years with the same rate of simple interest?

15. A swimming pool can be filled in 4 hours by 8 pumps of the same type. How many such pumps are required if the pool is to be filled in $2\frac{2}{3}$ hours?

16. In a hostel of 50 girls, there are food provisions for 40 days. If 30 more girls join the hostel, how long will these provisions last?

17. 30 persons can reap a field in 17 days. How many more persons should be engaged to reap the same field in 10 days?

18. The cost of 27 kg of iron is Rs 1,080, what will be the cost of 120 kg of iron of the same quality?

19. If 25 metres of cloth costs Rs 337.50, then
   (i) What will be the cost of 40 metres of the same type of cloth?
   (ii) What will be the length of the cloth bought for Rs 810?

20. A car travels a distance of 225 km in 25 litres of petrol. How many litres of petrol will be required to cover a distance of 540 kilometres by this car?

21. There are 20 grams of protein in 75 grams of sauted fish. How many grams of protein is in 225 gm of that fish?