



8.  $0 \times \frac{15}{17} = \underline{\hspace{2cm}}$ . [1]  
 a) 0 b) 15  
 c) 17 d)  $\frac{15}{17}$
9. A number which can be expressed as  $\frac{p}{q}$ , where p and q are integers and  $q \neq 0$  is [1]  
 a) integer b) rational number  
 c) whole number d) natural number
10.  $\frac{-7}{5} + \left( \frac{2}{-11} + \frac{-13}{25} \right) = \left( \frac{-7}{5} + \frac{2}{-11} \right) + \frac{-13}{25}$  [1]  
 This property is  
 a) closure b) associative  
 c) identity d) commutative
11. Divide the sum of  $\frac{4}{9}$  and  $\left( -\frac{7}{8} \right)$  by their product. [1]  
 a)  $\frac{28}{31}$  b)  $-\frac{31}{28}$   
 c)  $-\frac{28}{31}$  d)  $\frac{31}{28}$
12. Which of the following is correct? [1]  
 a.  $a + 0 = b$   
 b.  $-a \times b = b \times (-a)$   
 c.  $a - b = b - a$   
 d.  $\frac{a}{b} = \frac{b}{a}$   
 a) Option (a) b) Option (c)  
 c) Option (d) d) Option (b)
13. Find  $\frac{3}{7} + \left( -\frac{5}{14} \right) + \left( -\frac{8}{21} \right) + \frac{5}{21}$  [1]  
 a)  $-\frac{1}{14}$  b) -21  
 c) -1 d) 1
14. Which of the following statements is true? [1]  
 i. Natural numbers are commutative for subtraction.  
 ii. Whole numbers are commutative for subtraction.  
 iii. Integers are commutative for subtraction.  
 iv. Rational numbers are not commutative for subtraction.  
 a) Option (ii) b) Option (iv)  
 c) Option (iii) d) Option (i)
15. Evaluate:  $| 44 - [1 + 5 \{12 \div 4 - 2 (1 - 4 - 3)\}] |$  [1]  
 a) -14 b) 12  
 c) 28 d) 17
16. Find  $\frac{5}{7} + \left( -\frac{6}{7} \right) + \left( -\frac{8}{35} \right) + \frac{5}{21}$  [1]  
 a) -11 b) -105

17.  $-\frac{17}{18} \times \left(-\frac{18}{17}\right) = \underline{\hspace{2cm}}$ . [1]
- a)  $\frac{18}{17}$  b) 18  
c) 17 d) 1
18. Find the value of  $244 - [13 + 25 \{15 \div 3 - (13 - \overline{24 - 12})\}]$  [1]
- a) -156 b) 144  
c) 131 d) -144
19. Which of the following properties of rational numbers is shown below? [1]
- $\frac{3}{4} \times \left(\frac{7}{3} \times \frac{-4}{5}\right) = \left(\frac{3}{4} \times \frac{7}{3}\right) \times \frac{-4}{5}$
- a) Distributivity of addition over multiplication b) Associativity of multiplication  
c) Distributivity of multiplication over addition d) Commutativity of addition
20. Find  $\frac{7}{8} + \left(-\frac{5}{16}\right) + \left(-\frac{9}{16}\right) + \frac{5}{8}$  [1]
- a)  $\frac{5}{8}$  b) -5  
c) -8 d) 8
21. Name the property under multiplication used in  $\frac{-1}{3} \times (-3) = (-3) \times \frac{-1}{3} = 1$ . [1]
- a) Reciprocal and commutative under multiplication b) Distributive property  
c) Multiplicative identity d) Associative property
22. A rational number can be expressed as a terminating decimal if the denominator has factors: [1]
- a) 4 or 5 b) 2, 3 or 5  
c) 3 or 5 d) 2 or 5
23. Which of the following statements is false? [1]
- i. Natural numbers are commutative for addition.  
ii. Whole numbers are commutative for addition.  
iii. Integers are not commutative for addition.  
iv. Rational numbers are commutative for addition.
- a) Option (i) b) Option (iv)  
c) Option (iii) d) Option (ii)
24.  $\underline{\hspace{2cm}} = a$  for any rational number  $a$ . [1]
- a)  $a \times 2$  b)  $a \times 1$   
c)  $a \times 0$  d)  $a \times 3$
25. If  $x$  and  $y$  are two rational numbers, then which of the following statements is wrong? [1]
- a) All of these b) Every integer is a rational number

- c) Every fraction is a rational number      d) Every rational number is a fraction
26.  $42(4 + 2) = (42 \times 4) + (42 \times 2)$  is an example of [1]  
 a) commutative property      b) distributive property  
 c) associative property      d) closure property
27. Which of the following is not a rational number? [1]  
 i.  $\frac{3}{17}$   
 ii.  $\frac{-4}{19}$   
 iii.  $\frac{0}{8}$   
 iv.  $\frac{3}{0}$   
 a) Option (iv)      b) Option (iii)  
 c) Option (i)      d) Option (ii)
28. Addition of rational numbers satisfy the property? [1]  
 a) all of these      b) commutative  
 c) closure      d) associative
29. Which of the following is not true? [1]  
 a. rational numbers are closed under addition  
 b. rational numbers are not closed under subtraction  
 c. rational numbers are closed under multiplication  
 d. rational numbers are closed under division  
 a) Option (c)      b) Option (d)  
 c) Option (a)      d) Option (b)
30. Find  $\frac{5}{9} + \left(-\frac{5}{18}\right) + \left(-\frac{7}{18}\right) + \frac{7}{9}$  [1]  
 a)  $\frac{2}{3}$       b) -3  
 c)  $\frac{3}{2}$       d) -2
31. **Assertion (A):** Rational numbers are not closed under multiplication. [1]  
**Reason (R):** A rational number is a number that is in the form of  $\frac{p}{q}$ , where p and q are integers, and q is not equal to 0.  
 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.
32. **Assertion (A):** 1 has no multiplicative inverse. [1]  
**Reason (R):** When multiplied by the given number, gives 1 as the product.  
 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.
33. **Assertion (A):** Rational numbers are associative for subtraction. [1]  
**Reason (R):** The associative property states that the sum or the product of three or more

numbers does not change if they are grouped in a different way.

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.

34. **Assertion (A):**  $\left[\left(\frac{-1}{5}\right) + \left(\frac{-3}{5}\right)\right] + \left(\frac{1}{7}\right) = \left(\frac{-1}{5}\right) + \left[\left(\frac{-3}{5}\right) + \left(\frac{-1}{7}\right)\right]$  indicates associative law for addition. [1]

**Reason (R):** The associative property states that the sum or the product of three or more numbers does not change if they are grouped in a different way.

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.

35. **Assertion (A):** The reciprocal of  $\left(\frac{2}{5}\right) \times \left(\frac{4}{9}\right)$  is equal to  $\frac{45}{8}$ . [1]

**Reason (R):** There are countless rational numbers between any two given rational numbers.

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.

### Section B

36. The sum of two rational numbers is  $-\frac{8}{5}$ . If one of the numbers is  $\frac{9}{17}$ , find the other. [2]

37. From a rope 40 m long, pieces of equal size are cut. If the length of one piece is  $\frac{10}{3}$  m, find the number of such pieces. [2]

38. Which rational number should be subtracted from  $\frac{12}{7}$  to get  $\frac{-15}{4}$ ? [2]

39. Tell what property allows you to compute  $\frac{1}{3} \times \left(6 \times \frac{4}{3}\right)$  as  $\left(\frac{1}{3} \times 6\right) \times \frac{4}{3}$  [2]

40. The product of two rational numbers is -7. If one of the number is -5, find the other? [2]

41. Nikita distributed  $52\frac{1}{4}$  kg of rice equally among 11 families. How much rice did each family get? [2]

42. Verify the property  $x \times (y \times z) = (x \times y) \times z$  of rational number by using  $x = \frac{-2}{7}$ ,  $y = \frac{-5}{6}$  and  $z = \frac{1}{4}$  and What is the name of this property? [2]

Gross domestic product (GDP) is the total monetary or market value of all the finished goods and services [2]

43. produced within a country's borders in a specific time period. Japan's GDP was around  $\frac{21}{5}$  trillion dollars while India's GDP was around  $\frac{677}{200}$  trillion dollars in 2022. Which country had a greater GDP and by how much? [2]

44. By what numbers should we multiply  $\frac{-8}{13}$  so that the product may be 24? [2]

45. A train travels  $\frac{1445}{2}$  km in  $\frac{17}{2}$  h. Find the speed of the train in km/h. [2]

### Section C

46. Verify and name the property used [3]

$$\left(\frac{-3}{5} \times \frac{12}{13}\right) \times \frac{7}{8} = \frac{-3}{5} \times \left(\frac{12}{13} \times \frac{7}{8}\right)$$

47. using appropriate properties find :  $\frac{2}{5} \times \left(-\frac{3}{7}\right) - \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$  . [3]

48.  $\frac{1}{6}$  of the class students are above average,  $\frac{1}{4}$  are average and rest are below average. If there are 48 students in all, how many students are below average in the class? [3]
49. Simplify:  $\left(-5 \times \frac{2}{15}\right) - \left(-6 \times \frac{2}{9}\right)$  [3]
50. Find  $\frac{3}{7} + \left(\frac{-6}{11}\right) + \left(\frac{-8}{21}\right) + \left(\frac{5}{22}\right)$  [3]
51. Rohit practised cricket for  $12\frac{5}{6}$  hours last week. He practised  $2\frac{1}{8}$  hours this week. For how many hours did Rohit practise cricket in two weeks? [3]
52. Express  $\frac{5}{-3} + \left(\frac{3}{-2}\right) + \left(\frac{-7}{3}\right) + 3$  as a rational number in  $\frac{p}{q}$  form. [3]
53. The cost of  $2\frac{3}{4}$  meters of cloth is ₹  $75\frac{1}{4}$ . Find the cost of cloth per meter. [3]
54. Find  $(m + n) \div (m - n)$ , where  $m = \frac{5}{6}$  and  $n = \frac{-8}{9}$ . [3]
55. Verify commutative property of multiplication if  $x = 2$  and  $y = \frac{-7}{8}$ . [3]

#### Section D

**Question No. 56 to 60 are based on the given text. Read the text carefully and answer the questions:** [5]

Closure property states that for any two numbers  $a$  and  $b$ ,  $a * b$  is also a rational number, then the set of rational numbers is closed under addition.

**\*** represents **+**, **-**,  **$\times$**  or  **$\div$**

Let us study the closure property for all the operations on whole numbers in brief.

Operation	Numbers	Remarks
Addition	$0 + 5 = 5$ , a whole number $4 + 7 = \dots$ . Is it a whole number? In general, $a + b$ is a whole number for any two whole numbers $a$ and $b$ .	Whole numbers are closed under addition.
Subtraction	$5 - 7 = -2$ , which is not a whole number.	Whole numbers are not closed under subtraction.
Multiplication	$0 \times 3 = 0$ , a whole number $3 \times 7 = \dots$ . Is it a whole number? In general, if $a$ and $b$ are any two whole numbers, their product $a \times b$ is a whole number.	Whole numbers are closed under multiplication.
Division	$5 \div 8 = \frac{5}{8}$ , which is not a whole number.	Whole numbers are not closed under division.

Thus whole numbers are closed under addition, subtraction and multiplication but not closed under division

For the four types of number the closure property is shown in the following table.

Numbers	Closed under			
	addition	subtraction	multiplication	division
Rational numbers	Yes	Yes	Yes	No

Integers	Yes	Yes	Yes	No
Whole numbers	Yes	No	Yes	No
Natural numbers	Yes	No	Yes	No

56. Which of the following operation is closed for natural numbers?

- a)  $18 - 25 = -7$   
c)  $3 + 7 = 10$

57. Which of the following operation is not closed for integers?

- a)  $12 - 17 = -5$   
c)  $14 - 14 = 0$

58. The rational numbers in the operation  $\frac{5}{7} \times \frac{9}{11} = \frac{45}{77}$  are \_\_\_\_\_.

59. Rational numbers are closed under Division operation.

- a) True                      b) False

60. Which of the following operation is not closed for Rational numbers?

- a)  $\frac{3}{5} \times \frac{7}{11} = \frac{21}{55}$       b)  $\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$   
c)  $\frac{3}{5} + \frac{2}{5} = \frac{5}{5}$       d)  $\frac{2}{7} \div 0$  (not defined)

61. The sum of two rational numbers is -8. If one of the number is  $-\frac{18}{5}$ , find the other number. **[5]**

62. The overall width in cm of several wide-screen televisions is 97.28 cm,  $98\frac{4}{9}$  cm,  $98\frac{1}{25}$  cm and 97.94 cm. Express these numbers as rational numbers in the form  $\frac{p}{q}$  and arrange the widths in ascending order.

63. Manavi and Kuber each receive an equal allowance. The table shows the fraction of their allowance each deposit into his/her saving account and the fraction each spends at the mall. If the allowance of each is ₹1260, find the amount left with each. **[5]**

Where money goes	Fraction of allowance	
	Manavi	Kuber
Saving account	$\frac{1}{2}$	$\frac{1}{3}$
Spend at mall	$\frac{1}{4}$	$\frac{3}{5}$
Left over	?	?

64. What should be added to  $\left(\frac{1}{2} + \frac{1}{3} + \frac{1}{5}\right)$  to get 3? **[5]**

65. Find  $(x + y) \div (x - y)$  if  $x = \frac{5}{4}$  and  $y = \frac{-1}{3}$ . **[5]**

66. What will be the product of two rational numbers. Discuss your answer. [5]

67. Put the (√), wherever applicable [5]

Number	Natural Number	Whole Number	Integer	Fraction	Rational Number
(a) - 114					
(b) $\frac{19}{27}$					
(c) $\frac{623}{1}$					
(d) $-19\frac{3}{4}$					

(e) $\frac{73}{71}$					
(f) 0					

68. A recipe for 12 waffles calls for  $1\frac{1}{2}$  cups of milk,  $2\frac{1}{4}$  cups of flour, and  $1\frac{1}{3}$  cups of other ingredients. How many cups of all are needed to make 36 waffles. [5]
69.  $\frac{2}{5}$  of total number of students of a school come by car while  $\frac{1}{4}$  of students come by bus to school. All the other students walk to school, of which  $\frac{1}{3}$  walk on their own and the rest are escorted by their parents. If 224 students come to school walking on their own, how many students study in that school? [5]
70. Shalini has to cut out circles of diameter  $1\frac{1}{4}$  cm from an aluminium strip of dimensions  $8\frac{3}{4}$  cm by  $1\frac{1}{4}$  cm. How many full circles can Shalini cut? Also, calculate the wastage of the aluminium strip. [5]

