**CHAPTER 2**

**RATIONAL NUMBERS**

**QUESTION BANK**

**AVERAGE LEVEL**

**Question 1:**

A rational number is defined as a number that can be expressed in the form p/q, where p and q are integers and

(a) q = 0 (b) q = 1

(c) q ≠ 1 (d) q ≠ 0

**Question 2:**

Which of the following rational numbers is positive?

(a) $\frac{-8}{7}$ (b) $\frac{19}{-13}$

(c) $\frac{-3}{-4}$ (d) $\frac{-21}{13}$

**Question 3:**

Which of the following rational numbers is negative?

(a) $-\left(\frac{-3}{7}\right)$ (b) $\frac{-5}{-8}$

(c) $\frac{9}{8}$ (d) $\frac{3}{-7}$

**Question 4:**

In the standard form of a rational number, the common factor of numerator and denominator is always

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

**Question 5:**

Which of the following rational numbers is equal to its reciprocal?

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

**Question 6:**

The reciprocal of 1/2 is

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

**Question 7:**

The standard form of $\frac{-48}{60}$ is

(a) $\frac{48}{60}$ (b) $\frac{-60}{48}$ (c) $\frac{-4}{5}$ (d) $\frac{-4}{-5}$

**Question 8:**

Which of the following is equivalent to 4/5 ?

(a) $\frac{5}{4}$ (b) $\frac{16}{25}$

(c) $\frac{16}{20}$ (d) $\frac{15}{25}$

**Question 9:**

How many rational numbers are there between two rational numbers?

(a) 1 (b) 0

(c) unlimited (d) 100

**Question 10:**

In the standard form of a rational number, the denominator is always a

(a) 0 (b) negative integer

(c) positive integer (d) 1

**Question 11:**

To reduce a rational number to its standard form, we divide its numerator and denominator by their

(a) LCM (b) HCF

(c) product (d) multiple

**Question 12:**

Which is greater number in the following?

(a) $-\frac{1}{2}$ (b) 0 (c) $\frac{1}{2}$ (d)-2

**Fill in the Blanks**

In questions 13 to 46, fill in the blanks to make the statements true.

**Question 13:**

$\frac{-3}{8}$ is a _____ rational number .

**Question 14:**

$\frac{4}{7}$ is a____rational number.

**Question 15:**

The standard form of $\frac{-8}{36}$ is_____ .

**Question 16:**

The standard form of $\frac{18}{-24}$ is_____ .

**Question 17:**

On a number line, $\frac{-1}{2}$ is to the_____of Zero(0).

**Question 18:**

On a number line, $\frac{3}{4}$ is to the_____of Zero(0).

**Question 19:**

$\frac{-1}{2}$ is _____ than $\frac{1}{5}$.

**Question 20:**

$\frac{-3}{5}$ is _____ than 0.

**Question 21:**

$\frac{-16}{24}$ and $\frac{20}{-16}$ represent_____ rational numbers.

**Question 22:**

$\frac{-27}{45}$ and $\frac{-3}{5}$ represent_____ rational numbers.

**Question 23:**

Additive inverse of $\frac{2}{3}$ is_____.

**Question 24:**

$\frac{-3}{5} + \frac{2}{5}$ = _____.

**Question 25:**

$\frac{-5}{6} + \frac{-1}{6}$ = _____.

**Question 26:**

$\frac{3}{4} \times \left(\frac{-2}{3}\right)$ = _____.

**Question 27:**

$\frac{-5}{3} \times \left(\frac{-3}{5}\right)$ = _____.

**Question 28:**

Given, $\frac{-6}{7} = 4\bar{2}$

**Question 29:**

$\frac{1}{2} = \frac{6}{\_}$

**Question 30:**

$\frac{-2}{9} - \frac{7}{9}$ = _____

**MODERATE LEVEL**

**In questions 31 to 35, fill in the boxes with the correct symbol '<','<' or '='.**

**Question 31:**

$\frac{7}{-8} \square \frac{8}{9}$

**Question 32:**

$\frac{3}{7} \square \frac{-5}{6}$

**Question 33:**

$\frac{5}{6} \square \frac{4}{8}$

**Question 34:**

$\frac{-9}{7} < \frac{4}{-7}$

**Question 35:**

$\frac{8}{8} \square \frac{2}{2}$

**Question 36:**

The reciprocal of_____ does not exist.

**Question 37:**

The reciprocal of 1 is_____

**Question 38:**
$\frac{-3}{7} \div \left(\frac{-7}{3}\right)$ =_____

**Question 39:**
$0 \div \left(\frac{-5}{6}\right)$ =_____

**Question 40:**
$0 \times \left(\frac{-5}{6}\right)$ =_____

**Question 41:**
_____ x $\left(\frac{-2}{5}\right)$ =1

**Question 42:**
The standard form of rational number – 1 is_____.

**Question 43:**
If m is a common divisor of a and b, then $\frac{a}{b} = \frac{a+m}{-}$

**Question 44:**
If p and q are positive integers, then $\frac{p}{q}$ is a_____ rational number and $\frac{p}{-q}$ is a_____ rational number.

**Question 45:**
Two rational numbers are said to be equivalent or equal, if they have the same_____form.

**Question 46:**
If p/q is a rational number, then q cannot be_____

**True/False**

In questions 47 to 65, state whether the following statements are True or False.

**Question 47:**
Every natural number is a rational number, but every rational number need not be a natural

number.

**Question 48:**
Zero is a rational number.

**Question 49:**
Every integer is a rational number but every rational number need not be an integer.

**Question 50:**
Every negative integer is not a negative rational number.

**uestion 51:**
If $\frac{p}{q}$ is a rational number and m is a non-zero integer, then $\frac{p}{q} = \frac{p \times m}{q \times m}$

**Question 52:**
If $\frac{p}{q}$ is a rational number and m is a non-zero common divisor of p and q, then $\frac{p}{q} = \frac{p \div m}{q \div m}$

**Question 53:**
In a rational number, denominator always has to be a non-zero integer.

**Question 54:**
If $\frac{p}{q}$ is a rational number and m is a non-zero integer, then $\frac{p \times m}{q \times m}$ is a rational number not equivalent to $\frac{p}{q}$.

**Question 55:**
Sum of two rational numbers is always a rational number.

**Question 56:**
All decimal numbers are also rational numbers.

**Question 57:**
The quotient of two rationals is always a rational number.

**Question 58:**
Every fraction is a rational number.

**Question 59:**
Two rationals with different numerators can never be equal.

**Question 60:**
8 can be written as a rational number with any integer as denominator.

**Question 61:**
$\frac{4}{6}$ is equivalent to $\frac{2}{3}$

**Question 62:**
The rational number $\frac{-3}{4}$ lies to the right of zero on the number line.

**Question 63:**
The rational number $\frac{-12}{15}$ and $\frac{-7}{17}$ are on the opposite sides of zero on the number line.

**Question 64:**
Every rational number is a whole number.

**Question 65:**
Zero is the smallest rational number.

**Question 66:**
Match the following:

| | Column I | | Column II |
|---|---|---|---|
| (i) | $\frac{a}{b}+\frac{a}{b}$ | (a) | $\frac{-a}{b}$ |
| (ii) | $\frac{a}{b}+\frac{c}{d}$ | (b) | $-1$ |
| (iii) | $\frac{a}{b}+(-1)$ | (c) | $1$ |
| (iv) | $\frac{a}{b}+\frac{-a}{b}$ | (d) | $\frac{bc}{ad}$ |
| (v) | $\frac{b}{a}+\left(\frac{d}{c}\right)$ | (e) | $\frac{ad}{bc}$ |

**Question 67:**
Write each of the following rational numbers with positive denominators.
$\frac{5}{-8}, +\frac{15}{28}\frac{-17}{13}$

**Question 68:**

Express $\frac{3}{4}$ as a rational number with denominator:

(a)36 (b) — 80

**Question 69:**

Reduce each of the following rational numbers in its lowest form

(i) $\frac{-60}{72}$

(ii) $\frac{91}{-364}$

**Question 70:**

Express each of the following rational numbers in its standard form

(i) $\frac{-12}{-30}$ (ii) $\frac{14}{-49}$

(iii) $\frac{-15}{35}$ (iv) $\frac{299}{-161}$

**HIGHER LEVEL**

**Question 71:**

Are the rational numbers $\frac{-8}{28}$ and $\frac{32}{-12}$ equivalent? Give reason.

**Question 72:**

Arrange the rational numbers $\frac{-7}{10}, \frac{5}{-8}, \frac{2}{-3}, \frac{-1}{4}, \frac{-3}{5}$ in ascending order.

**Question 73:**

Represent the following rational numbers on a number line.

$\frac{3}{8}, \frac{-7}{3}, \frac{22}{-6}$

**Question 74:**

If $\frac{-5}{7} = \frac{\times}{28}$ find the value of x.

**Question 75:**

Give three rational numbers equivalent to

(i) $\frac{-3}{4}$

(ii) $\frac{7}{11}$

**Question 76:**

Write the next three rational numbers to complete the pattern:

(i) $\frac{4}{-5}, \frac{8}{-10}, \frac{12}{-15}, \frac{16}{-20}, \_\_, \_\_, \_\_$

(ii) $\frac{-8}{7}, \frac{-16}{14}, \frac{-24}{21}, \frac{-32}{28}, \_\_, \_\_, \_\_$

**Question 77:**

List four rational numbers between $\frac{5}{7}$ and $\frac{7}{8}$.

**Question 78:**

Find the sum of

(i) $\frac{8}{13}$ and $\frac{3}{11}$

(ii) $\frac{7}{3}$ and $\frac{-4}{3}$

**Question 79:**

Solve:

(i) $\frac{29}{4} - \frac{30}{7}$

(ii) $\frac{5}{13} - \frac{-8}{26}$

**Question 80:**

Find the product of

(i) $\frac{-4}{5}$ and $\frac{-5}{12}$

(ii) $\frac{-22}{11}$ and $\frac{-21}{11}$

**Question 81:**

Simplify:

(i) $\frac{13}{11} \times \frac{-14}{5} + \frac{13}{11} \times \frac{-7}{5} + \frac{-13}{11} \times \frac{34}{5}$

(ii) $\frac{6}{5} \times \frac{3}{7} - \frac{1}{5} \times \frac{3}{7}$

**Question 82:**

Simplify:

(i) $\frac{3}{7} \div \left(\frac{21}{-55}\right)$

(ii) $1 \div \left(-\frac{1}{2}\right)$

**Question 83:**

Which is greater in the following?

(i) $\frac{3}{4}, \frac{7}{8}$

(ii) $-3\frac{5}{7}, 3\frac{1}{9}$

**Question 84:**

Write a rational number in which the numerator is less than '-7 x 11' and the denominator is greater than '12+ 4'.

**Question 85:**

If x = $\frac{1}{10}$ and y = $\frac{-3}{8}$, then evaluate x + y, x-y, xxy and x ÷ y.

**Question 86:**

Find the reciprocal of the following:

(i) $\left(\frac{1}{2} \times \frac{1}{4}\right) + \left(\frac{1}{2} \times 6\right)$

(ii) $\frac{20}{51} \times \frac{4}{91}$

(iii) $\frac{3}{13} \div \frac{-4}{65}$

(iv) $\left(-5 \times \frac{12}{15}\right) - \left(-3 \times \frac{2}{9}\right)$

**Question 87:**

Complete the following table by finding the sums.

| + | $-\frac{1}{9}$ | $\frac{4}{11}$ | $\frac{-5}{6}$ |
|---|---|---|---|
| $\frac{2}{3}$ | | | |
| $-\frac{5}{4}$ | | $-\frac{39}{44}$ | |
| $-\frac{1}{3}$ | | | |

**Question 88:**

Write each of the following numbers in the form p/q, where p and q are integers.

(a) six-eighths (b) three and half

(c) opposite of 1 (d) one-fourth

(e) zero (f) opposite of three-fifths

**Question 89:**

$\frac{p}{q} = \frac{\square}{\square}$

**Question 90:**

Given that, $\frac{p}{q}$ and $\frac{r}{s}$ are two rational numbers with different denominators and both of them are in standard form. To compare these rational numbers, we say that

(a) $\frac{\square}{\square} < \frac{\square}{\square}$, if $p \times s < r \times q$

(b) $\frac{p}{q} = \frac{r}{s}$, if $\frac{\square}{\square} = \frac{\square}{\square}$

(c) $\frac{\square}{\square} > \frac{\square}{\square}$, if $p \times s > r \times q$

**Question 91:**

In each of the following cases, write the rational number whose numerator and denominator are respectively as under:

(a) 5-39 and 54-6 (b) (- 4) x 6 and 8 ÷ 2

(c) 35 ÷ (- 7) and 35 -18 (d) 25 +15 and 81÷40

**Question 92:**

Write the following as rational numbers in their standard forms.

(a) 35% (b) 1.2

(c) $-6\frac{3}{7}$ (d) 240 + (– 840)

(e) 115 + 207

**Question 93:**

Find a rational number exactly halfway between

(a) $\frac{-1}{3}$ and $\frac{1}{3}$ (b) $\frac{1}{6}$ and $\frac{1}{9}$

(c) $\frac{5}{-13}$ and $\frac{-7}{9}$ (d) $\frac{1}{15}$ and $\frac{1}{12}$

**Question 94:**

Taking $x = \frac{-4}{9}$, $y = \frac{5}{12}$ and $z = \frac{7}{18}$, find

(a) The rational number which when added to $x$ gives $y$.
(b) The rational number which subtracted from $y$ given $z$.
(c) The rational number which when added to $z$ gives us $x$.
(d) The rational number which when multiplied by $y$ to get $x$.
(e) The reciprocal of $x + y$.
(f) The sum of reciprocals of $x$ and $y$.
(g) $(x \div y) \times z$
(h) $(x - y) + z$
(i) $x + (y + z)$
(j) $x + (y + z)$
(k) $x - (y + z)$

**Question 95:**

What should be added to $\frac{-1}{2}$ to obtain the nearest natural number?

**Question 96:**

What should be subtracted from $\frac{-2}{3}$ to obtain the nearest integer?

**Question 97:**

What should be multiplied with $\frac{-5}{8}$ to obtain the nearest integer?

**Question 98:**

What should be divided by $\frac{-1}{2}$ to obtain the greatest negative integer?

**Question 99:**

From a rope 68 m long, pieces of equal size are cut. If length of one piece is $4\frac{1}{4}$ m, find the number of such pieces.

**Question 100:**

If 12 shirts of equal size can be prepared from 27 m cloth, what is length of cloth required for each shirt?

**Question 101:**

Insert 3 equivalent rational numbers between

(i) $\frac{-1}{2}$ and $\frac{1}{5}$ (ii) 0 and – 10