RRB/RRC
GROUP – D

MATHEMATICS GUIDE

Chapter-wise Practice Exercise

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Covers 100 % Syllabus

RRB/RRC GROUP – D

MATHEMATICS GUIDE

Team Prabhat

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by Team Prabhat

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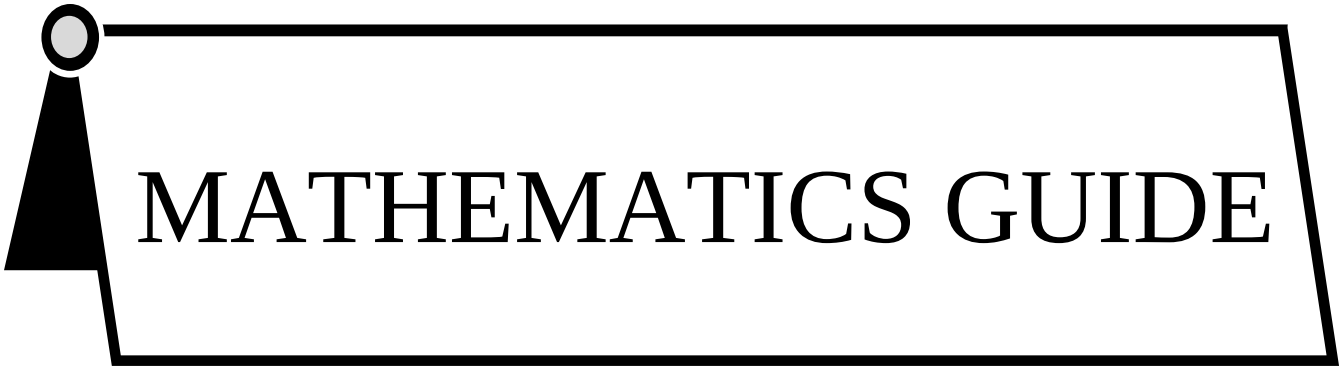
MATHEMATICS GUIDE

1 NUMBERS AND FRACTIONS

- Numeral: In Hindu Arabic system, we use ten symbols, numeral 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. We call them digits.
  A number is denoted by a group of digits, called numeral.
- Place value: In a numeral 176524, we have
  Place value of 4 = (4 × 1) = 4
  Place value of 2 = (2 × 10) = 20
  Place value of 5 = (5 × 100) = 500
  Place value of 6 = (6 × 1000) = 6000
  Place value of 7 = (7 × 10000) = 70000
  Place value of 1 = (1 × 100000) = 100000
- Face value: The face value of a digit in a numeral is the value of the digit itself. Wherever it may be in the place value chart.
  In the numeral 17625, the face value of 5 is 5, the face value of 2 is 2, the face value of 6 is 6 and so on.

Types of numbers:

(i) Natural numbers: The counting numbers are called natural numbers.
Thus, N = {1, 2, 3, 4, 5, 6, 7 ...} is the set of natural numbers.

(ii) Whole numbers: All natural numbers together with zero (0) form the set W of all whole numbers.
W = {0, 1, 2, 3, 4, 5, 6, 7 ...} is the set of all whole numbers.
Note:
- Every natural number is a whole number.
- 0 is a whole number which is not a natural number.

(iii) Integers: All natural numbers, negatives of natural number and 0, together form the set I of all integers.
Thus, I = {.... – 4, – 3, – 2, –1, 0, 1, 2, 3, 4, ...}, I is the set of all negative and positive integers.

(iv) Even numbers: A number divisible by 2 is called an even number.
Thus, {2, 4, 6, 8, 10, 12, 14, 16 ...} is the set of all even numbers.

(v) Odd numbers: A number not divisible by 2 is called an odd number.
Thus, {1, 3, 5, 7, 9, 11, 13, 15....} is the set of odd numbers.

(vi) Prime numbers: A number greater than 1 having exactly two factors, namely 1 and itself is called a prime number.

(vii) Rational numbers: A number of the form $\frac{p}{q}$ is called Rational number, (where p and q are integers and $q \neq 0$)
Thus, $\frac{3}{4}, \frac{5}{6}, \frac{6}{7}$ etc. are rational numbers.

(viii) Irrational numbers: A number which is not of the form of $\frac{p}{q}$ is called irrational number (where p and q are integers and $(q \neq 0)$
Thus $\sqrt{3}, \sqrt{5}, \pi$ etc. are Irrational numbers.

(ix) Composite numbers: Numbers greater than 1 which are not prime, are called composite numbers.
Thus, 4, 6, 8, 9, 10 and 12 etc. are composite numbers.
Note: (i) 1 is neither prime nor composite.
(ii) 2 is the only even number which is prime.

(x) Co-prime: Two natural numbers a and b are said to be co-prime if their HCF is 1.
Thus, (2, 3), (4, 5), (7, 9) etc. are pairs of co-primes.

Division on numbers: Dividend, Divisor, Quotient and Remainder.
Let a number a is divided by another number b and we get quotient q and remainder r.
Then, Dividend = Divisor × Quotient + Remainder
$[a = bq + r]$ where $(a \leq r < b)$

Test of divisibility:

(i) Divisibility by 2: A number is divisible by 2 if its units digit is any of 0, 2, 4, 6 and 8.
Example: 342, 4616, 52316 etc.

(ii) Divisibility by 3: A number is divisible by 3 if the sum of its digits is divisible by 3.
Example: 96342, 462372 etc.

(iii) Divisibility by 4: A number is divisible by 4 if the number formed by the last two digits is divisible by 4.
Example: 1728, 16520, 17624 etc.

(iv) Divisibility by 5: A number is divisible by 5, if its unit's digit is either 0 or 5.
Example: 625, 15725, 100000 etc.

(v) Divisibility by 6: A number is divisible by 6 if it is divisible by both 2 and 3.
Example: 6432, 74936 etc.

(vi) Divisibility by 8: A number is divisible by 8, if the number formed by the last three digits of the given number is divisible by 8.
Example: 175248, 976488 etc.

(vii) Divisibility by 9: A number is divisible by 9, if the sum of its digits is divisible by 9.
Example: 6372, 5943276 etc.