

# Real Numbers

## 1. Introduction to Number System

**Q1.** If  $\sqrt[3]{32} = 2^x$  then x is equal to

- (A) 5
- (B) 3
- (C) 3/5
- (D) 5/3

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Analyzing**

**Q2.**  $\sqrt{2}$  is–

- (A) An integer
- (B) A rational number
- (C) An irrational number
- (D) None of these

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

**Q3.**  $1/\sqrt{3}$  is –

- (A) A rational number
- (B) An irrational number
- (C) a whole number
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Understanding**

**Q4.**  $3 \times 7 + 8 \times 7$  and  $2 \times 4 \times 5 + 2 \times 3$  are :

- (A) composite numbers
- (B) prime numbers
- (C) whole numbers
- (D) none of these

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Understanding**

**Q5.** 3.123012300123000.....is :

- (A) a repeating decimal number.
- (B) a rational number.
- (C) an irrational number
- (D) both (A) and (B)

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

**Q6.**  $5 - \sqrt{3}$  is –

- (A) An integer

- (B) A rational number
- (C) An irrational number
- (D) None of these

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Understanding**

**Q7.**  $7\sqrt{3}$  is –

- (A) An irrational
- (B) A natural number
- (C) A rational number
- (D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

**Q8.** Between any two distinct rational numbers–

- (A) There lie infinitely many rational numbers.
- (B) There lies only one rational number.
- (C) There lie only finitely many numbers.
- (D) There lie only rational numbers.

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Understanding**

**Q9.** If  $(\sqrt{2} + \sqrt{3})^2 = a + b\sqrt{6}$ , where  $a, b \in \mathbb{Q}$ , then –

- (A)  $a = 5, b = 6$
- (B)  $a = 5, b = 2$
- (C)  $a = 6, b = 5$
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Evaluating**

**Q10.** If  $p$  is a positive prime integer, then  $\sqrt{p}$  is –

- (A) A rational number
- (B) An irrational number
- (C) a positive integer
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Understanding**

**Q11.** If  $x = (7 + 4\sqrt{3})$ , then the value of  $x^2 + 1/x^2$  is –

- (A) 193
- (B) 194
- (C) 195
- (D) 196

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Understanding**

**Q12.** If  $x$  and  $y$  are positive real numbers, then –

- (A)  $\sqrt{x} + \sqrt{y} > \sqrt{x + y}$
- (B)  $\sqrt{x} + \sqrt{y} < \sqrt{x + y}$
- (C)  $\sqrt{x} + \sqrt{y} = \sqrt{x + y}$
- (D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

**Q13.** The greatest possible number with which when we divide 37 and 58, leaves the respective remainder of 2 and 3, is -

- (A) 2
- (B) 5
- (C) 10
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Analyzing**

**Q14.** The non-terminating and non-repeating decimals are called :

- (A) rational numbers.
- (B) irrational numbers.
- (C) real numbers.
- (D) none

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

**Q15.** The product of a non-zero rational and an irrational number is :

- (A) always rational
- (B) always irrational
- (C) cannot be determined
- (D) none of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Understanding**

**Q16.**  $n$  and  $e$  are -

- (A) Natural numbers
- (B) Integers
- (C) Rational numbers
- (D) Irrational numbers.

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

$$\pi = \frac{\text{Circumference of the circle}}{\text{Diameter of the circle}}$$

**Q17.**

- (A) A rational number
- (B) A whole number
- (C) A positive integer

(D) None of these

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Understanding**

**Q18.**  $0.737373\dots =$

(A)  $(0.73)^3$

(B)  $73/100$

(C)  $73/99$

(D) None of these

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Evaluating**

**Q19.** If  $a, b \in \mathbb{R}$  and  $a < b$ , then –

(A)  $1/a < 1/b$

(B)  $1/a > 1/b$

(C)  $a^2 > b^2$

(D) Nothing can be said

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Understanding**

**Q20.** If  $x$  and  $y$  are rational numbers such that  $\sqrt{xy}$  is irrational, then  $\sqrt{x} + \sqrt{y}$  is

(A) Rational

(B) Irrational

(C) Non-real

(D) None of these

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Understanding**

**Q21.** If  $x$  is a non-zero rational number and  $xy$  is irrational, then  $y$  must be –

(A) a rational number

(B) an irrational number

(C) non-zero

(D) an integer

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Understanding**

**Q22.** A number lies between 300 and 400. If the number is added to the number formed by reversing the digits, the sum is 888 and if the unit's digit and the ten's digit change places, the new number exceeds the original number by 9. Find the number.

(A) 339

(B) 341

(C) 378

(D) 345

Correct Answer: **(D)**

Level: **Difficult**

Tagging: **Applying**

## **2. Euclid's Division Lemma**

**Q23.** The series of a well defined steps which gives a procedure for solving a type of problem is

- (A) Lemma
- (B) Algorithms
- (C) Logarithm
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

**Q24.** Every even integer is of the form of

- (A)  $2q + 1$
- (B)  $2q + 3$
- (C)  $2q$
- (D)  $2q + 2$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

**Q25.** Find the HCF 96 and 404

- (A) 6
- (B) 8
- (C) 4
- (D) 2

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Evaluating**

**Q26.** Use Euclid's division algorithms to find the H.C.F of 615 and 154

- (A) 1
- (B) 2
- (C) 3
- (D) 5

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

**Q27.** Euclid's division Lemma states that if  $a$  and  $b$  are any two positive integers, then there exist unique integers  $q$  and  $r$  such that-

- (A)  $a = bq + r, 0 < r \leq b$
- (B)  $a = bq + rm, 0 = q < b$
- (C)  $a = bq + r, 0 \leq r < b$
- (D)  $a = bq + r, 0 < q \leq b$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

**Q28.** For any two positive integers  $x$  and  $y$ ,  $x > y$ , by Euclid's division lemma we can write :

- (A)  $x = y + q$
- (B)  $x = qy + r$
- (C)  $y = qx - r$

(D)  $x = qy - r$

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

**Q29.** If  $x$  and  $y$  are two positive integers such that  $x = py + r$ , where  $p$  and  $r$  are whole numbers, then :

(A)  $0 < r < p$

(B)  $0 > r > p$

(C)  $0 \leq r < p$

(D)  $0 \geq r > p$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

**Q30.** If  $33 = 4 \times 7 + r$ , then the value of  $r$  is :

(A) 6

(B) 5

(C) 4

(D) 3

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Evaluating**

**Q31.** If 561 is divided by 7, then possible values of remainder are :

(A) 0, 1, 2, 3, 4, 5, 6

(B) 1, 2, 3, 4, 5, 6

(C) 2, 4, 6

(D) none

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Understanding**

**Q32.** The greatest number that divides 49 and 39 leaving the remainder 4 in each case is :

(A) 15

(B) 5

(C) 4

(D) 3

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Evaluating**

**Q33.** The relationship with the given positive integers  $a$  and  $b$ , there exists unique integers  $q$  and  $r$ , where  $0 \leq r \leq b$  is

(A)  $a = bq + r$

(B)  $a = br + q$

(C)  $a = bq - r$

(D)  $a = -bq + r$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

**Q34.** If the quotient and remainder were  $3a - 5$  and  $9a + 10$ , on dividing  $3a^3 + a^2 + 2a + 5$  by  $g(a)$ . find  $g(a)$

- (A)  $a^2 - 2a - 1$
- (B)  $a^2 + 2a + 1$
- (C)  $a^2 + a + 3$
- (D)  $2a^2 + a + 1$

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Evaluating**

**Q35.** The G.C.D of  $(2002, k) = 4$ , then the value of  $k$  is

- (A) All even values
- (B) 3 only
- (C) All odd values
- (D) For all values of  $k$ , it is not possible

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Evaluating**

**Q36.** The greatest number of five digits exactly divisible 279 is-

- (A) 99603
- (B) 99837
- (C) 99882
- (D) 99881

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Understanding**

**Q37.** The greatest possible number with which when we divide 37 and 58, leaves the respective remainder of 2 and 3, is –

- (A) 2
- (B) 5
- (C) 10
- (D) None of these

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Evaluating**

**Q38.** The HCF of 2781 and 729 by Euclid's Division Lemma is \_\_\_\_.

- (A) 35
- (B) 13
- (C) 9
- (D) 27

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Evaluating**

**Q39.** How many numbers lie between 11 and 1111 which when divided by 9 leave a remainder of 6 and when divided by 21 leave a remainder of 12?

- (A) 18
- (B) 28
- (C) 8

(D) None of these

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

**Q40.** In a problem involving division, the divisor is eight times the quotient and four times the remainder. If the remainder be 12, then the dividend is

(A) 400

(B) 342

(C) 300

(D) 450

Correct Answer: **(C)**

Level: **Difficult**

Tagging: **Analyzing**

**Q41.** The G.C.D of two numbers is 16 and the first 4 quotients obtained in the division are equal to 2. Then the numbers are

(A) 342, 126

(B) 464, 192

(C) 232, 90

(D) 768, 336

Correct Answer: **(B)**

Level: **Difficult**

Tagging: **Evaluating**

**Q42.** The greatest number of five digits which on being divided by 56, 72, 84 and 96 leaves 50, 66, 78 and 90 as remainders is -

(A) 98784

(B) 98778

(C) 98790

(D) 97778

Correct Answer: **(B)**

Level: **Difficult**

Tagging: **Evaluating**

**Q43.** The largest possible number with which when 38, 66 and 80 are divided the remainders remain the same is-

(A) 14

(B) 7

(C) 28

(D) None of these

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

**Q44.** The largest possible number with which when 60 and 98 are divided, leaves the remainder 3 in each case, is -

(A) 38

(B) 18

(C) 19

(D) None of these



Correct Answer: **(C)**

Level: **Difficult**

Tagging: **Evaluating**

**Q45.** Three numbers which are co-primes to each other are such that the product of the first two is 551 and that of the last two is 1073. The sum of the three numbers is

- (A) 75
- (B) 81
- (C) 85
- (D) 89

Correct Answer: **(C)**

Level: **Difficult**

Tagging: **Evaluating**

**Q46.** What is the least number which when divided by 8, 12 and 16 leaves 3 as the remainder in each case, but when divided by 7 leaves no remainder?

- (A) 147
- (B) 145
- (C) 197
- (D) None of these

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

**Q47.** What is the least possible number which when divided by 24, 32 or 42 in each case it leaves the remainder 5?

- (A) 557
- (B) 677
- (C) 777
- (D) None of these

Correct Answer: **(B)**

Level: **Difficult**

Tagging: **Evaluating**

### **3. The Fundamental Theorem of Arithmetic**

**Q48.**

Find the LCM of 96 and 404

- (A) 6464
- (B) 6472
- (C) 9664
- (D) 3264

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

**Q49.** The number which can be factorised as a product of primes

- (A) Composite number
- (B) Natural number
- (C) Whole number
- (D) Rational number

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

**Q50.** By the method of prime factorization, find the HCF and LCM of 12 , 15, 21

- (A) HCF = 4, LCM = 120
- (B) HCF = 3, LCM = 420
- (C) HCF = 3, LCM = 220
- (D) HCF = 2, LCM = 420

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Evaluating**

**Q51.** Every composite number can be expressed as a product of \_\_\_\_\_

- (A) natural numbers
- (B) rational numbers
- (C) whole numbers
- (D) prime numbers

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

**Q52.**  $\text{HCF}(p, q) \times \text{LCM}(p, q) =$

- (A)  $p + q$
- (B)  $q - p$
- (C)  $p \times q$
- (D)  $pq$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

**Q53.** How many different prime numbers are there in the prime factorisation of 5005 ?

- (A) 3
- (B) 4
- (C) 5
- (D) 2

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Evaluating**

**Q54.** If HCF of 8 and 36 = 4, find the LCM?

- (A) 70
- (B) 52
- (C) 48
- (D) 72

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Evaluating**

**Q55.**  $\text{LCM} \times \text{HCF} =$

- (A) Product of two numbers
- (B) Quotient of two numbers
- (C) Addition of two numbers
- (D) Subtraction of two numbers

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

**Q56.** The H.C.F of 52 and 91 is :

- (A) 13
- (B) 17
- (C) 19
- (D) 23

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

**Q57.** The L.C.M. of 15 and 25 is 75. Find H.C.F.

- (A) 10
- (B) 15
- (C) 5
- (D) 2

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Evaluating**

**Q58.** The prime factorisation of 81 and 36 are  $3^4$  and  $3^2 \times 2^2$  respectively the, their L.C.M. is :

- (A) 324
- (B) 326
- (C) 81
- (D) 162

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

**Q59.** The prime number which is not in the prime factorisation of 3600 is :

- (A) 2
- (B) 7
- (C) 3
- (D) 5

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Evaluating**

**Q60.** The product of  $4\sqrt{6}$  and  $3\sqrt{24}$  is –

- (A) 124
- (B) 134
- (C) 144
- (D) 154

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Evaluating**

**Q61.** Find the LCM of 495 and 475 by prime factorisation method

- (A) 42025
- (B) 47025
- (C) 67025

(D) 74025

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Evaluating**

**Q62.** Find the LCM of 6, 72 and 120

(A) 220

(B) 120

(C) 420

(D) 360

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

**Q63.** H.C.F of two numbers is 18 and the first 4 quotients obtained in the division are 2, 1, 2, 2. Then the two numbers are

(A) 342, 126

(B) 343, 126

(C) 342, 125

(D) None of these

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Applying**

**Q64.** H.C.F. of  $(x^2 - 3x + 2)$  and  $(x^2 - 4x + 3)$  is -

(A)  $(x - 1)$

(B)  $(x - 2)^2$

(C)  $(x - 1)(x + 2)$

(D)  $(x - 1)(x - 3)$

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

**Q65.** Somya has 210 toffees and only 55 barfis for her birthday function. She wants to pack them in small packets so that each packet contains same number of items. What is the number of items in each packet ?

(A) 5

(B) 7

(C) 8

(D) 6

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

**Q66.** LCM of three numbers 28, 44, 132 is-

(A) 528

(B) 231

(C) 462

(D) 924

Correct Answer: **(D)**

Level: **Difficult**

Tagging: **Evaluating**

**Q67.** The largest number which divides 62, 132 and 237 and leaves the same remainder in each case is

- (A) 34
- (B) 33
- (C) 35
- (D) 36

Correct Answer: **(C)**

Level: **Difficult**

Tagging: **Evaluating**

**Q68.** The least perfect square number which is divisible by 8, 15, 20, 22 is

- (A) 435600
- (B) 43560
- (C) 39600
- (D) 465660

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

**Q69.** The nearest integer to 58701 which is divisible by 567 is-

- (A) 58968
- (B) 58434
- (C) 58401
- (D) 58989

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

**Q70.** The total number of divisors of 10500 except 1 and itself is –

- (A) 48
- (B) 5
- (C) 46
- (D) 56

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

**Q71.** The traffic lights at three different road crossings change after every 48 sec, 72 sec and 108 sec respectively. If they all change simultaneously at 8.20.00 hours, then at what time will they again change simultaneously?

- (A) 08:27:12
- (B) 07:23:06
- (C) 08:20:24
- (D) 08:30:16

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

**Q72.** What is the least possible number which when divided by 18, 35 or 42 leaves 2, 19, 26 as the remainders respectively?

- (A) 514
- (B) 614
- (C) 314

(D) None of these

Correct Answer: **(B)**

Level: **Difficult**

Tagging: **Evaluating**

**Q73.** What is the least possible number which when divided by 2, 3, 4, 5, 6 leaves the remainders 1, 2, 3, 4, 5 respectively?

(A) 39

(B) 48

(C) 59

(D) None of these

Correct Answer: **(C)**

Level: **Difficult**

Tagging: **Evaluating**