QUESTION BANK

EXERCISE - 1

Q.1 Let x be a real variable, and let $3 < x < 4$. Name five values that x might have.

Q.2 What is a real number ?

Q.3 What are the two main categories of real numbers?

Q.4 Name all the categories to which each of the following belongs.

(i)3 (ii) – 3 (iii) –1/2 (iv) $\sqrt{3}$ (v) $5\frac{3}{4}$

(vi) –11/2, (vii) 1.732 (viii) 6.920920920..... (ix) 6.9205729744....

Q.5 What is a real variable?

Q.6 Which numbers have rational square roots?

Q.7 A rational number can always be written in what form?

Q.8 Which of the following numbers are rational ?

1, – 6, 3½, $-\frac{2}{3}$, 0, 5.8, 3.14159265358979323846264 33

Q.9 What are the rational numbers?

Q.10 Prove that $\sqrt{3}+\sqrt{2}$ is irrational.

Q.11 Find the HCF of 96 and 404 by the prime factorisation method. Hence, find their LCM.

Q.12 Given that H.C.F. of (306, 657) = 9, find the L.C.M. of (306, 657).

Q.13 Find the HCF of 12576 and 4052 by using the fundamental theorem of Arithmetic.

Q.14 Find the largest which divides 245 and 1029 leaving remainder 5 in each case.

Q.15 The length, breadth and height of a room are 8m 25 cm, 6m 75 cm and 4m 50 cm, respectively. Determine the longest rod which can measure the three dimensions of the room exactly.

Q.16 Explain why $11 \times 13 \times 17 + 17$ is a composite number.

Q.17 Show that there is no positive integer n for which $\sqrt{n-1}+\sqrt{n+1}$ is rational.

Q.18 If the sum of two numbers is 1215 and their HCF is 81, find the number of such pairs.

Q.19 Find the HCF of 300, 540, 890 by applying Euclid's alogrithm.

Q.20 Find the LCM and HCF of 336 and 54 by the prime factorization method.

Q.21 Show that every positive even integer is of the form 2q, and that every positive odd integer is of the form 2q + 1, where q is some integer.

Q.22 Show that the square of any positive integer is either of the form 3m or 3m + 1 for some integer m.

Q.23 Use Euclid's algorithm to find the HCF of 4052 and 12576.

Q.24 Show that any positive odd integer is of the form 4q + 1 or 4q + 3, where q is some integer.

Q.25 Show that $5-\sqrt{3}$ is irrational.

Q.26 Show that any positive odd integer is of the form 6q + 1 or 6q + 3 or 6q + 5, where q is any positive integer.

Q.27 Prove that the of two consecutive positive integer is divisible by 2.

Q.28 For any positive integer n, prove that $n^3 - n$ divisible by 6.

Q.29 A sweetseller has 420 kaju barfis and 130 badam barfis. She wants to stack them in such a way that each stack has the same number, and they take up the least area of the tray. What is the maximum number of barfis that can be placed in each stack for this purpose?

Q.30 Consider the numbers 4^n, where n is a natural number. Check whether there is any value of n for which 4^n ends with the digit zero.

Q.31 Show that $3\sqrt{2}$ is irrational.

Direction : For Q.32 to Q.Q.37

Check whether both or single statement is/are sufficient or not to find solution.

Q.32 Is the prime number p equal to 37 ?
(A) $p = n^2 + 1$, where n is an integer. (B) p^2 is greater than 200.

Q.33 What is the remainder if the positive integer y is divided by 3 ?
(A) y is an even integer. (B) y is a multiple of 6.

Q.34 Is X the square of an integer ? (A) $\sqrt{x} = 9/2$ (B) x = 64

Q.35 N is an integer between 1 and 84. What is the value of n ?
(A) The square root of n is divisible by 5.
(B) n is both the square of an integer and the cube of an integer.

Q.36 Is n odd ? (A) n is divisible by 3, 5, 7 and 9. (B) $0 < n < 400$

Q.37 Is the number completely divisible by 99 ?
(A) The number is divisible by 9 and 11 simultaneously.
(B) If the digits of the number are reversed, the number is divisible by 9 and 11.

EXERCISE - 2

Fill in the Blanks :

Q.1 $\sqrt{5}$ is .... number

Q.2 $\frac{1}{\sqrt{2}}$ is .... number

Q.3 $3+2\sqrt{5}$ .... number

Q.4 $7\sqrt{5}$ is .... number

Q.5 4. If p is a prime and p divides .... then p divides q, where a is a positive integer.

Q.6 $6+\sqrt{2}$ is .... number

Q.7 An .... is a series of well defined steps which gives a procedure for solving a type of problem.

Q.8 A .... is a proven statement used for proving another statement.

Q.9 LCM of 96 and 404 is ....

Q.10 HCF of 6, 72 and 120 is ....

Q.11 156 as a product of its prime factors ....

Q.12 LCM of 26 and 91 is ....

Q.13 HCF of 26 and 91 is ....

Q.14 $\frac{35}{50}$ .... decimal expansion.

True-False statements :

Q.15 Given positive integers a and b, there exist whole numbers q and r satisfying $a = bq + r$, $0 \le r < b$.

Q.16 Every composite number can be expressed (factorised) as a product of primes, and this factorisation is unique, apart from the order in which the prime factors occur.

Q.17 $\sqrt{2}, \sqrt{3}$ are irrationals.

Q.18 If Let x = p/q be a rational number, such that the prime factorisation of q is of the form 2^n5^m, where n, m are non-negative integers. Then x has a decimal expansion which terminates.

Q.19 If x = p/q be a rational number, such that the prime factorisation of q is not of the form $2^n 5^m$, where n, m are non-negative integers. Then x has a decimal expansion which is terminates.

Q.20 Any positive odd integer is of the form 6q + 1, or 6q + 3, or 6q + 5, where q is some integer.

Q.21 Cube of any positive integer is of the form 9m, 9m + 1 or 9m + 8.

EXERCISE - 3

Q.1 The nearest integer to 58701 which is divisible by 567 is–
(A) 58968 (B) 58434 (C) 58401 (D) None

Q.2 The greatest number of five digits exactly divisible 279 is–
(A) 99603 (B) 99837 (C) 99882 (D) None

Q.3 The nearest whole number to one million which is divisible by 537 is –
(A) 1000106 (B) 999894 (C) 1000437 (D) 999563

Q.4 The largest number which exactly divides 70, 80, 160, 105 is –
(A) 7 (B) 5 (C) 10 (D) None

Q.5 The least perfect square number which is divisible by 8, 15, 20, 22 is –
(A) 435600 (B) 43560 (C) 39600 (D) None

Q.6 The greatest number which can divide 1854, 1866 and 2066 leaving the same remainder 2 in each case is –
(A) 4 (B) 6 (C) 12 (D) None

Q.7 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) None

Q.8 By what smallest number must 21600 be multiplied or divided in order to make it a perfect square.
(A) 6 (B) 5 (C) 3 (D) 7

Q.9 When 2^{256} is divided by 17 the remainder would be –
(A) 1 (B) 16 (C) 14 (D) None of these

Q.10 The sum of three non-zero prime numbers is 100. One of them exceeds the other by 36. Find the largest number.
(A) 73 (B) 91 (C) 67 (D) 57

Q.11 If N is the sum of first 13,986 prime numbers, then N is always divisible by –
(A) 6 (B) 4 (C) 8 (D) None of these

Q.12 H.C.F. of $(x^3 - 3x + 2)$ and $(x^2 - 4x + 3)$ is –
(A) $(x - 1)$ (B) $(x - 2)^2$ (C) $(x - 1)(x + 2)$ (D) $(x - 1)(x - 3)$

Q.13 If two numbers when divided by a certain divisor give remainder 35 and 30 respectively and when their sum is divided by the same divisor, the remainder is 20, then the divisior is –
(A) 40 (B) 45 (C) 50 (D) 55

Q.14 In order that the number 1 y 3 y 6 be divisible by 11, the digit y should be –
(A) 1 (B) 2 (C) 5 (D) 6

Q.15 The rational number of the form $\frac{q}{q}$, $q \neq 0$, p and q are positive integers , which represents $0.1\overline{34}$ i.e., (0.1343434....) is –
(A) $\frac{134}{999}$ (B) $\frac{134}{990}$ (C) $\frac{133}{999}$ (D) $\frac{133}{990}$

Q.16 The sum of three non-zero prime numbers is 100. One of them exceeds the other by 36. Find the largest number.
(A) 73 (B) 91 (C) 67 (D) 57

Q.17 If N is the sum of first 13,986 prime numbers, then N is always divisible by –
(A) 6 (B) 4 (C) 8 (D) None of these

Q.18 The least number which is a perfect square and is divisible by each of 16, 20 and 24 is –
(A) 240 (B) 1600 (C) 2400 (D) 3600

Q.19 Find the least number which when divided by 12, leaves a remainder of 7, when divided by 15, leaves a remainder of 10 and when divided by 16, leaves a remainder of 11 –
(A) 115 (B) 235 (C) 247 (D) 475

Q.20 If n is an even natural number, then the largest natural number by which n (n + 1) (n + 2) is divisible is –
(A) 6 (B) 8 (C) 12 (D) 24

Q.21 Find the least number which when divided by 15, leaves a remainder of 5, when divided by 25, leaves a remainder of 15 and when divided by 35 leaves a remainder of 25 –
(A) 515 (B) 525 (C) 1040 (D) 1050

Q.22 If $(-1)^n + (-1)^{4n} = 0$, then n is –
(A) any positive integer (B) any negative integer
(C) any odd natural number (D) any even natural number

Q.23 The number $3^{13} - 3^{10}$ is divisible by –
(A) 2 and 3 (B) 3 and 10 (C) 2, 3 and 10 (D) 2, 3 and 13

Q.24 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

Q.25 What number has to be added to 345670 in order to make it divisible by 6 ?
(A) 2 (B) 4 (C) 5 (D) 6

Q.26 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) $a = bq + r,\ 0 < r \le b$ (B) $a = bq + rm,\ 0 \le q < b$
(C) $a = bq + r,\ 0 \le r < b$ (D) $a = bq + r,\ 0 < q \le b$

Q.27 How many prime factors are there in the prime factorisation of 5005 –
(A) 2 (B) 4 (C) 6 (D) 7

Q.28 Which of the following will have a terminating decimal expansion –
(A) 77/210 (B) 23/30 (C) 125/441 (D) 23/8

Q.29 The HCF of 280 and 674 is –
(A) 2 (B) 4 (C) 14 (D) 28

Q.30 What is the number x –
I. The LCM of x and 18 is 36. II. The HCF of x and 18 is 2.
(A) 1 (B) 2 (C) 3 (D) 4

EXERCISE - 4

MATCH THE COLUMN

Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **column I** have to be matched with statements (p, q, r, s) in **column II**.

Q.1 Column II gives HCF for pair given in column I, match them correctly.

Column I	Column II
(A) 135 and 255	(p) 8
(B) 196 and 38220	(q) 51
(C) 255 and 867	(r) 15
(D) 616 and 32	(s) 196

Q.2 Column II gives LCM for pair given in column I, match them correctly.

Column I	Column II
(A) 92 and 510	(p) 182
(B) 306 and 657	(q) 23460
(C) 54 and 336	(r) 22338
(D) 26 and 91	(s) 3024