CLASS 10 - MATHEMATICS
Chap1-Real Numbers-Practice Questions

1. $\sqrt{2}$ is   **[1]**

    a) a non-terminating repeating decimal   b) a rational number

    c) a terminating decimal   d) an irrational number

2. $2.\overline{35}$ is   **[1]**

    a) a terminating decimal number   b) non terminating and non repeating
                                                      decimal

    c) an irrational number   d) a rational number

3. If p and q are co-prime numbers, then p^2 and q^2 are   **[1]**

    a) even   b) coprime

    c) not coprime   d) odd

4. Every positive odd integer is of the form _____ where 'q' is some integer.   **[1]**

    a) 2q + 2   b) 5q + 1

    c) 3q + 1   d) 2q + 1

5. $\left(2 + \sqrt{2}\right)$ is   **[1]**

    a) none of these   b) an integer

    c) a rational number   d) an irrational number

6. The HCF and the LCM of 12, 21, 15 respectively are: **[1]**

    a) 3, 140   b) 420, 3

    c) 12, 420   d) 3, 420

7. If a is rational and $\sqrt{b}$ is irrational, then $a + \sqrt{b}$ is: **[1]**

    a) an irrational number   b) an integer

    c) a natural number   d) a rational number

8. The LCM of two numbers is 1200. Which of the following cannot be their HCF?   **[1]**

    a) 500   b) 200

    c) 600   d) 400

9. If HCF of two numbers is 1, the two numbers are called relatively _____ or _____.   **[1]**

    a) composite, co-prime   b) composite, prime

    c) prime, co-prime   d) twin primes, square numbers

10. The LCM of $2^3 \times 3^2$ and $2^2 \times 3^3$ **[1]**

    a) 2×3^2 b) $2^3 \times 3^3$

c) $2^2 \times 3^2$ d) $2^2 \times 3$

11. Without actual division, show that $\frac{15}{1600}$ is a terminating decimal. Express the fraction in decimal form. **[1]**

12. If the product of two numbers is 2500 and their HCF is 50, find their LCM. **[1]**

13. After how many places will decimal expansion of $\frac{21}{24}$ terminate? **[1]**

14. State Euclid's division lemma. **[1]**

15. If least prime factor of a is 3 and least prime factor of b is 7, what is least prime factor of (a + b)? **[1]**

16. The HCF of 45 and 105 is 15. Write their LCM. **[1]**

17. Express 360 as product of its prime factors. **[1]**

18. State whether $\frac{129}{2^2 \times 5^7 \times 7^{17}}$ will have terminating decimal expansion or a non-terminating repeating decimal expansion. **[1]**

19. Write 32875 as product of prime factors. Is this factorisation unique? **[1]**

20. Can two numbers have 18 as their HCF and 380 as their LCM? Give reason. **[1]**

21. Show that $\frac{2+3\sqrt{2}}{7}$ is not a rational number, given that $\sqrt{2}$ is an irrational number. **[2]**

22. Prove that $\frac{3}{2\sqrt{5}}$ is irrational. **[2]**

23. Without actual division, show that rational number $\frac{31}{2^2 \times 5^3}$ is a terminating decimal. Express decimal form. **[2]**

24. Express the HCF of 234 and 111 as 234x + 111y, where x and y are integers. **[2]**

25. Show that every positive even integer is of the form 2m and that every positive odd integer is of the form (2m + 1), where m is some integer. **[2]**

26. Without actual division, show that $\frac{9}{35}$ is a non terminating repeating decimal. **[2]**

27. Find the LCM of the following polynomials: $22x(x+1)^2$ and $36x^2\left(2x^2 + 3x + 1\right)$ **[2]**

28. Find the LCM and HCF of 8, 9 and 25 by applying the prime factorisation method. **[2]**

29. Without actual division, show that rational number $\frac{17}{90}$ is a non-terminating repeating decimal. **[2]**

30. Explain why $3 \times 5 \times 7 + 7$ is a composite number. **[2]**

31. Complete the factor-tree and find the composite number M. **[2]**
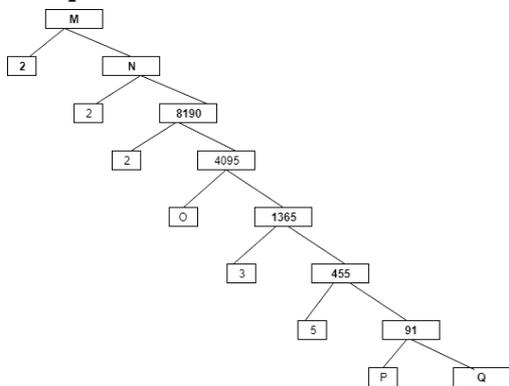
32. If n is an odd integer, then show that $n^2 - 1$ is divisible by 8. **[2]**

33. What is the smallest number that, when divided by 35, 56 and 91 leaves remainders of 7 in each case? **[3]**

34. Show that the square of any positive integer cannot be of the form 6m + 2 or 6m + 5 for any integer m. **[3]**

35. A sweet seller 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 number of barfis that can be placed in each stack for this purpose? **[3]**

36. Is product of a rational number and an irrational number, a rational number? Is product of two irrational numbers a rational number or irrational number? Justify giving examples. **[3]**

37. Use Euclid's division algorithm to find the HCF of 136, 170 and 255. **[3]**

38. Use Euclid Division Lemma to show that cube of any positive integer is either of the form 9m, (9m + 1) or (9m + 8). **[3]**

39. Prove that $\sqrt{5}$ is irrational. **[3]**

40. Prove $\frac{1}{2+\sqrt{3}}$ is an irrational number. **[3]**

41. Show that $\sqrt{6} + \sqrt{2}$ is irrational. **[3]**

42. Prove that the product of two consecutive positive integers is divisible by 2. **[3]**

43. Show that cube of any positive integer is of the form 4m, 4m + 1 or 4m + 3, for some integer m. **[5]**

44. In a seminar the number of participants in Mathematics, Physics and Biology are 336, 240 and 96. Find the minimum number of rooms required if in each room same number of participants is to be seated and all of them being in the same subject. **[5]**

45. State Fundamental theorem of Arithmetic. Find LCM of numbers 2520 and 10530 by prime factorization method. **[5]**

46. Prove that one of every three consecutive positive integers is divisible by 3. **[5]**

47. Prove that $\sqrt{5} + \sqrt{7}$ is irrational. **[5]**

48. Prove that the area of $\triangle$ABC is irrational **[5]**
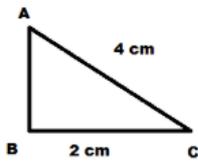
49. **Read the case study based questions carefully and answer any four out of the following:** **[4]**

As we know cleanliness leads to good health and orderliness makes a person better organized in life. To maintain good habits and awareness about the environment schools and co-study space now-a-days have several magazines and books about the environment. The library of the school ABC contains books on environment and cleanliness that are placed in the front shelf, there are three sets of English, Hindi, and Sociology books dealing with cleanliness these are stacked in such a way that all books are stored topic wise and the height of each stack is the same. The number of English books is 96 the number of Hindi books is 240 and the number of Sociology books is 336.

  i. Which Mathematical concept is used in this problem of placing the numbers of books?
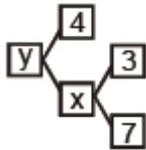
    a. LCM

b. HCF

c. Both HCF and LCM

d. None of these

ii. LCM of 96, 240, 336 is

a. 3360

b. 3630

c. 363

d. 630

iii. Assuming that the books are of the same thickness, determine the number of stacks of English, Hindi, and Sociology books respectively

a. 7, 5, 2

b. 5, 2, 7

c. 2, 5, 7

d. 2, 7, 5

iv. The values of x and y in the given figure are:

a. x = 10; y = 14

b. x = 21; y = 84

c. x = 21; y = 25

d. x = 10; y = 40

v. If two positive integers A and B can be expressed as A = xy^3 and B = x^4y^2z; x, y being prime numbers then HCF (A, B) is

a. xy²

b. x^4y^2z

c. x^4y^3

d. x^4y^3z

50. **Read the case study based questions carefully and answer any four out of the following:** **[4]**

Paul and Elder state that 'Thinking is not driven by answers but by questions', keeping this idea in mind, A Maths teacher explains the concept of real numbers to 10th-grade students by making a chart. The chart for the set of real numerals including all the types are given below:
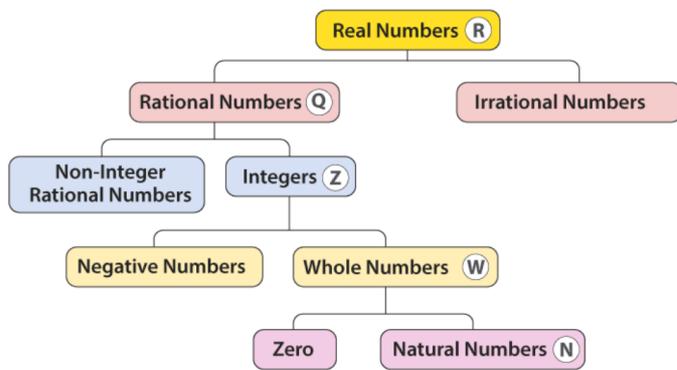
To develop interest and motivate students to become actively involved in the concept he asked some questions:

i. The sum of a rational and irrational number is

    a. rational

    b. irrational

    c. both of the above

    d. none of the above

ii. The decimal expansion of the number $\dfrac{144}{2^2 \times 5^3 \times 7}$ is

    a. terminating

    b. non-terminating

    c. non-terminating non-repeating

    d. none of the above

iii. A rational number in its decimal expansion is 327.7081. What would be the prime factors of q when the number is expressed in the p/q form?

    a. 2 and 3

    b. 3 and 5

    c. 2, 3 and 5

    d. 2 and 5

iv. Which of the following is not irrational?

    a. $(3+\sqrt{7})$

    b. $(3-\sqrt{7})$

    c. $(3+\sqrt{7})(3-\sqrt{7})$

    d. $3\sqrt{7}$

v. The product of a non-zero rational and an irrational number is

    a. always a rational number

    b. always an irrational number

    c. 1

    d. prime number