

X CLASS REVISION PROGRAMME

PRIORITY - I

$q = p \times$

1 MARK :

Multiple Choice Questions :

1. If 'p' and 'q' are natural numbers and 'p' is the multiple of 'q', then what is the HCF of 'p' and 'q'?
 a) pq b) p c) q d) $p + q$
 (March - 2023)
2. The prime factorisation of natural number 288 is
 a) $2^4 \times 3^3$ b) $2^4 \times 3^2$ c) $2^5 \times 3^2$ d) $2^5 \times 3^1$
 (March - 2019, 2023)
3. If $\text{HCF}(72, 120) = 24$, then $\text{LCM}(72, 120)$ is
 a) 72 b) 120 c) 360 d) 9640
 (March - 2023)
4. If n is a natural number, then 8^n cannot end with digit
 a) 0 b) 2 c) 4 d) 6
 (March - 2023)
5. The ratio of HCF to LCM of the least composite number and the least prime number is :
 a) $1 : 2$ b) $2 : 1$ c) $1 : 1$ d) $1 : 3$
 (March - 2018, 2023)
6. The number $(5 - 3\sqrt{5} + \sqrt{5})$ is :
 a) an integer b) a rational number c) an irrational number d) a whole number
 (March - 2023)
7. The product of the HCF and LCM of two numbers 50 and 20 is :
 a) 10 b) 100 c) 1000 d) 20
 (March - 2023)
8. The product of a non-zero rational number and an irrational number is :
 a) always irrational b) always rational c) rational or irrational d) always positive
 (March - 2023)
9. Which of the following is rational ?
 a) $\sqrt{6} + \sqrt{9}$ b) $\sqrt{2} + \sqrt{4}$ c) $\sqrt{4} + \sqrt{9}$ d) $\sqrt{3} + \sqrt{5}$
 ()
10. The decimal expansion of ' π '
 a) is non-terminating and non-recurring b) is terminating c) does not exist d) is non-terminating and recurring
 ()

2 MARKS :

1. Using prime factorisation, find HCF and LCM of 96 and 120.
 (March - 2023)
2. Show that 6^n can not end with digit 0 for any natural number 'n'.
 (July - 2023, March - 2023)
- Prove that $2 + \sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.
 (March - 2018), (March - 2023)

Explain why $7 \times 11 \times 13 + 13$ is a composite number?

(March - 2016)

Show that the numbers 143 and 187 are not co-prime?

(March - 2015, 2016)

6. Using fundamental theorem of arithmetic, find the H.C.F of 26, 51 and 91.
7. The HCF and LCM of two numbers are 9 and 90 respectively. If one number is 18, find the other.
8. Prove the following are irrational numbers

(15)

$$a) 5 - \sqrt{3} = \frac{\alpha}{\beta}$$

$$b) (3\sqrt{2})^2 = \frac{\alpha^2}{b^2}$$

$$c) \left(\frac{1}{\sqrt{2}}\right)^2 = \frac{\alpha^2}{b^2}$$

$$\begin{aligned} 18b^2 &= a^2 \\ (18)^2 c^2 &= a^2 \\ (18)^2 &= b^2 \end{aligned}$$

3 MARKS :

1. Prove that $\sqrt{5}$ is an irrational number. (March - 2019, 2023)
2. Find the HCF and LCM of 26, 65 and 117, using prime factorisation. $13 = \text{HCF}$
 $2 \times 13 \quad 5 \times 13 \quad 9 \times 13 \quad 13^2$
 $\text{LCM} = 1170$ (March - 2023)

3. Three bells ring at intervals of 6, 12 and 18 minutes. If all the three bells rang at 6 a.m., when will they ring together again ? $6 \times 3 = 18$ a.m. (March - 2023)

4. Prove that $3 + 7\sqrt{2}$ is an irrational number, given that $\sqrt{2}$ is an irrational number. $5 | 13180, 7575$
 $3 | 3630, 1515$ (March - 2023, 2018)

5. Find by prime factorisation the LCM of the numbers 18180 and 7575. Also, find the HCF of the two numbers. $1325, 303$ (March - 2023)

6. Find the L.C.M and H.C.F of 404 and 96 and verify that $\text{L.C.M} \times \text{H.C.F} = \text{Product of the two numbers}$. (March, 2018)

7. Two tankers contain 620 litres and 840 litres of diesel respectively. Find the maximum capacity of a container which can measure the diesel of both the tankers in exact number of times. (March - 2014, 2015, 2016)

5 MARKS :

1. There is a circular path around a sports field. Sonia takes 18 minutes for one round of the field and Ravi takes 12 minutes for the same. Suppose they both start from the same point and at the same time. After how many minutes will they meet again at the starting point ? (March, 2020)

2. Find HCF of 44, 96 and 404 by prime factorization method. Hence find their LCM. $36m$ (March, 2020)

3. On a morning walk, three persons step off together and their steps measure 40 cm, 42 cm and 45 cm respectively. What is the minimum distance each should walk so that each can cover the same distance and complete steps ?

(March - 2019)(NCERT Exemplar)

4. Prove that $\sqrt{3}$ is an irrational number. Hence, show that $7 + 2\sqrt{3}$ is also an irrational number.

5. Find HCF of 378, 180 and 420 by prime factorization method. Is $HCF \times LCM$ of three numbers equal to the product of the three numbers?

(March - 2016)

X CLASS REVISION PROGRAMME

PRIORITY - II

1 MARK :

Multiple Choice Questions.

- (a) If $p^2 = \frac{32}{50}$, then p is a/an
 a) whole number b) integer c) rational number d) irrational number
2. HCF of $(3^4 \times 2^2 \times 7^3)$ and $(3^2 \times 5 \times 7)$ is :
 a) 630 b) 63 c) 729
3. The prime factorisation of the number 2304 is
 a) $2^8 \times 3^2$ b) $2^7 \times 3^3$ c) $2^8 \times 3^1$
4. (HCF \times LCM) for the numbers 70 and 40 is :
 a) 10 b) 280 c) 2800
5. If two positive integers x and y are written as $x = a^3b^2$ and $y = ab^3$, where a and b are prime numbers, then their HCF (x, y) is :
 a) ab b) ab^2 c) a^3b^3 d) a^2b^2
6. The greatest number which divides both 30 and 80, leaving remainder 2 and 3 respectively
 a) 10 b) 7 c) 11 d) 14
7. If 'n' is any natural number, then 12^n cannot end with what digit?
 a) 2 b) 4 c) 8 d) 0
8. A pair of irrational numbers whose product is a rational number is
 a) $\sqrt{16}, \sqrt{4}$ b) $\sqrt{5}, \sqrt{2}$ c) $\sqrt{3}, \sqrt{27}$ d) $\sqrt{36}, \sqrt{2}$
9. $\pi - \frac{22}{7}$ is
 a) a rational number b) an irrational number c) a prime number d) an even number
10. The least number that is divisible by all the numbers from 1 to 5 (both inclusive) is
 a) 5 b) 60 c) 20 d) 100

2 MARKS :

1. Show that $(15)^n$ cannot end with the digit 0 for any natural number 'n'. (March 2023)
2. Two numbers are in the ratio 2 : 3 and their LCM is 180. What is the HCF of these numbers? (March 2023)
3. What is the largest number that divides 245 and 1029, leaving remainder 5 in each ? (March 2023)
4. If two positive integers p and q are written as $p = a^2b^3$ and $q = a^3b$, where a and b are prime numbers, then verify $\text{LCM}(p, q) \times \text{HCF}(p, q) = pq$ (March 2015, 2016)

5. Find the greatest number which divides 85 and 72 leaving remainders 1 and 2 respectively.

6. Prove that the sum of rational number and an irrational number is always irrational.

7. Determine the values of 'm' and 'n' so that the prime factorisation of 10500 is expressible as $2^m \times 3 \times 5^n \times 7$.

8. Two numbers are in the ratio of 15 : 11. If their H.C.F is 13, find the numbers.

3 MARKS :

 - Find the largest number which on dividing 1251, 9377 and 15628 leaves remainders 1, 2 and 3 respectively.
 - The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they change simultaneously at 7 a.m., at what time will they change together next?
 - Prove that $2 - 3\sqrt{5}$ is an irrational number, given that $\sqrt{5}$ is an irrational number.
 - Pens are sold in pack of 8 and notepads are sold in pack of 12. Find the least number of pack of each type that one should buy so that there are equal number of pens and notepads.
 - Find the greatest number of six digits exactly divisible by 18, 24 and 36.
 - Find the least number of five digits which is exactly divisible by 12, 15 and 18.
 - Is square root of every non - square number always irrational? Find the smallest natural number which divides 2205 to make its square root a rational number.
 - Show that $(\sqrt{3} + \sqrt{5})^2$ is an irrational number.

5 MARKS :

 - A sweet shopkeeper prepares 396 gulab jamuns and 342 ras-gullas. He packs them in containers. Each container consists of either gulab jamuns or ras-gullas but have equal number of pieces. Find the number of pieces he should put in each box so that number of boxes are least.
 - Dhudnath has two vessels containing 720 mL and 405 mL of milk respectively. Milk from these containers is poured into glasses of equal capacity to their brim. Find the minimum number of glasses that can be filled.

Varsity Education Management Pvt. Ltd

X CLASS REVISION PROGRAMME

3. In a seminar, the number of participants in Hindi, English and Mathematics are 60, 84 and respectively. Find the minimum number of rooms required if in each room the same number of participants are to be seated and all them being in the same subject. HCF
4. The product of two numbers x and y is 217728. Find the LCM and HCF of x and y if it is given $\text{LCM}(x,y) = 42 \text{ HCF}(x,y)$. 217728 = 42 (\text{HCF})^2 \text{HCF} = 72
5. Prove that $\sqrt{3}$ is an irrational number. Hence prove that $\frac{3}{2\sqrt{3}}$ is an irrational number.

PRIORITY - III

1 MARK :

Multiple Choice Questions.

- The total number of factors of prime number is
a) 1 b) 0 c) 2 d) 3
- The L.C.M of smallest two digit composite number and smallest composite number is
a) 12 b) 4 c) 44 d) 20
- If p is a prime number then LCM of p , p^2 and p^3 is
a) p b) p^3 c) p^2 d) p^6
- The largest number which divides 70 and 125, leaving remainders 5 and 8 respectively is
a) 65 b) 875 c) 13 d) 1750
- The H.C.F of two consecutive odd numbers is
a) 1 b) 0 c) 2 d) 3
- a and b are two positive integers such that the least prime factor of a is 3 and the least prime factor of b is 5. Then the least prime factor of $(a + b)$ will be
a) 1 b) 2 c) 3 d) 4
- $(6 + 5\sqrt{3}) - (4 - 3\sqrt{3})$ is
a) a rational number b) an irrational number c) a natural number d) an integer
- $n^2 - 1$ is divisible by 8, if n is
a) an integer b) a natural number c) an odd integer d) an even integer
- The exponent of 3 in the prime factorization of 864 is :
a) 2 b) 3 c) 4 d) 8
- The smallest number of 4 digits exactly divisible by 12, 15, 18 and 27 is
a) 1000 b) 1080 c) 1002 d) 1001

2 MARKS :

- Write the smallest number which is divisible by both 306 and 657. (March - 2019)
- Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.

3. Show that 12^n cannot end with digits 0 or 5 for any natural number, n. (NCERT Exemplar)
4. Prove that $\frac{3\sqrt{2}}{4}$ is an irrational number.
5. Find the smallest number which leaves remainders 8 and 12 when divided by 28 and 32 respectively. (20)
6. In a school there are two sections - section A and section B of class X. There are 32 students in section A and 36 students in section B. Determine the minimum number of books required for their class library so that they can be distributed equally among students of section A or section B. LCM

3 MARKS :

1. What is the HCF and LCM of two prime numbers a and b ? Three alarm clocks ring at intervals of 6, 9 and 15 minutes respectively. If they start ringing together, after what time will they next ring together ? 90

(March - 2014, 2015, 2016)

2. If two positive integers x and y are expressible in terms of primes as $x = p^2 q^3$ and $y = p^3 q$, what can you say about their LCM and HCF. Is LCM a multiple of HCF ? Explain.

(March - 2015, 2016)

3. Find the least perfect square which is divisible by each of the numbers 16, 20 and 24.

$$\begin{aligned} 3600 &= 16 \times 20 \times 24 \\ &= 2^4 \times 2^2 \times 5 \times 2^3 \times 3 \\ &= 2^4 \times 5 \times 3 \\ \text{LCM} &= 2^4 \times 5 \times 3 \\ &= 16 \times 15 \times 15 \\ &= 3600 \end{aligned}$$

5 MARKS :

1. The sum of LCM and HCF of two numbers is 7380. If the LCM of these numbers is 7340 more than their HCF, find the product of the two numbers.

(March - 2016)

2. Find the largest positive integer that will divide 398, 436 and 542 leaving remainders 7, 11 and 15 respectively.

3. Prove that $(3 + 2\sqrt{5})^2$ is irrational.

4. If x is rational and \sqrt{y} is irrational, then prove that $(x + \sqrt{y})$ is irrational.

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

(NCERT Exemplar)

6. If P is a prime number, then prove that \sqrt{P} is irrational.

$$\sqrt{P} = \frac{a}{b}$$

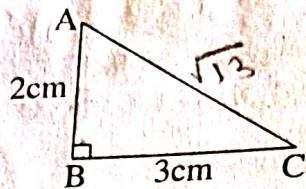
$$\begin{array}{c} 391 \ 425 \ 527 \\ \hline 23, 25, 31 \end{array}$$

X CLASS REVISION PROGRAMME

ASSERTION & REASON

- a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of (A).
 b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
 c) Assertion (A) is true but Reason (R) is false.
 d) Assertion (A) is false but Reason (R) is true.

1. Assertion (A) : The perimeter of $\triangle ABC$ is a rational number. (March)
 Reason (R) : The sum of the squares of two rational numbers is always rational.



2. Assertion (A) : The number 5^n cannot end with the digit 0, where n is a natural number.
 Reason (R) : Prime factorisation of 5 has only two factors, 1 and 5. (March)
3. Assertion (A) : The H.C.F of two numbers is 5 and their product is 150, then their LCM is
 Reason (R) : For any two positive integers a and b, $H.C.F(a, b) \times L.C.M(a, b) = a \times b$. []
4. Assertion (A) : H.C.F and L.C.M of two natural numbers are 25 and 815 respectively.
 Reason (R) : L.C.M of two natural numbers is always divisible by their H.C.F. []
5. Assertion (A) : $\sqrt{11}$ is an irrational number.
 Reason (R) : If p is a prime number, then \sqrt{p} is an irrational number. []

CASE STUDY

Case Study - 1 :

February 14 is celebrated as International Book Giving Day and many countries in the world celebrate this day. Some people in India also started celebrating this day and donated following number of books of various subjects to a public library :

History = 96, Science = 240, Mathematics = 336. (July)

These books have to be arranged in minimum number of stacks such that each stack contains books of only one subject and the number of books on each stack is the same. Based on the above information, answer the following questions :

- How many books are arranged in each stack?
- How many stacks are used to arrange all the Mathematics books?