



LCM & HCF

LCM

A common multiple is a number that is a multiple of two or more than two numbers. The common multiples of 3 and 4 are 12, 24,...

The least common multiple (LCM) of two numbers is the smallest positive number that is a multiple of both.

Multiples of 3 — 3, 6, 9, 12, 15, 18, 21, 24,...

Multiples of 4 — 4, 8, 12, 16, 20, 24, 28,...

Therefore, LCM of 3 and 4 will be 12, which is the lowest common multiple of 3 and 4.

First of all, the basic question which lies is—for what kind of numbers, we can use LCM?

Let us explain it through an example: LCM of 10, 20, and 25 is 100. It means that 100 is the lowest number, which is divisible by all these three numbers.

Since (-100) is lower than 100 and divisible by each of 10, 20, and 25, can the LCM be (-100)? or can it be 0? Further, what will be the LCM of (-10) and 20? Will it be (-20) or (-200) or (-2000) or smallest of all the numbers, that is, $-\infty$?

Answer to all these questions is very simple: LCM is a concept defined only for positive numbers, whether the number is an integer or a fraction. In other words, **LCM is not defined for negative numbers or zero.**

Now, we will define a different method for finding the LCM of two or more than two positive integers.

Process to Find LCM

Step 1 Factorize all the numbers into their prime factors.

Step 2 Collect all the distinct factors.

Step 3 Raise each factor to its maximum available power and multiply.

Example 4 LCM of 10, 20, 25.

Solution

Step 1 $10 = 2^1 \times 5^1$

$20 = 2^2 \times 5^1$

$25 = 5^2$

Step 2 2, 5

Step 3 $2^2 \times 5^2 = 100$

One of the principal advantage of using this method is that we can find the LCM of any number of numbers in a straight line without using the conventional method. The following explains this using the previous example: The LCM of 10 and 20 = 20, and LCM of 20 and 25 = 100 (For this, we have to know which factor of 25 is not present in 20; then, we need to multiply it by this factor. Therefore, 25 is having 5² and 20 is having 5¹ only, and hence, we will multiply 20 by 5.)

Highest Common Factor (HCF)

The factors that are positive integral values of a number and can divide that number is called HCF. HCF, which is also known as Greatest Common Divisor (GCD), is the highest value that can divide the given numbers.

Factors of 20 — 1, 2, 4, 5, 10, 20.

Factors of 30 — 1, 2, 3, 5, 6, 10, 15, 30.

Therefore, 10 will be the HCF of 20 and 30.

Process to Find HCF

Step 1 Factorize all the numbers into their prime factors.

Step 2 Collect all the common factors.

Step 3 Raise each factor to its minimum available power and multiply.

Example 7 HCF of 100, 200, and 250

Solution

Step 1 $100 = 2^2 \times 5^2$

$200 = 2^3 \times 5^2$

$250 = 5^3 \times 2^1$

Step 2 2, 5

Step 3 $2^1 \times 5^2 = 50$

Alternatively, to find HCF of numbers such as 100, 200, and 250, we have to observe the common quantity that can be taken from these numbers. To do this, we can write these

numbers as $(100x + 200y + 250z)$, and now, it can be very easily observed that we can take 50 as the common number from the given numbers.

The LCM and HCF can be summarized as follows: it is very essential to understand the mechanism of determining LCM and HCF. These two concepts can be understood easily by the following example:

Terminology

Prime number : A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself.

For example, 2, 3, 5, 7, 11, 13, etc. are prime numbers.

Co-Prime Number: Two numbers are said to be relatively prime, mutually prime, or co-prime to each other when they have no common factor or the only common positive factor of the two numbers is 1. In other words, two numbers are said to be co-primes if their H.C.F. is 1.

Factors: The numbers are said to be factors of a given number when they exactly divide that number. Thus, factors of 18 are 1, 2, 3, 6, 9 and 18.

Common Factors: A common factor of two or more numbers is a number which divides each of them exactly. Thus, each of the numbers - 2, 4 and 8 is a common factor of 8 and 24.



Multiple: When a number is exactly divisible by another number, then the former number is called the multiple of the latter number.

Thus, 45 is a multiple of 1, 3, 5, 9, 15 and 45.

Common Multiple: A common multiple of two or more numbers is a number which is exactly divisible by each of them.

For example, 12, 24 and 36 is a common multiple of 3, 4, 6 and 12.

Prime Factorisation: If a natural number is expressed as the product of prime numbers, then the factorisation of the number is called its prime factorisation.

A prime factorisation of a natural number can be expressed in the exponential form.

For example:

$$(1) 24 = 2 \times 2 \times 2 \times 3 = 2^3 \times 3.$$

$$(2) 420 = 2 \times 2 \times 3 \times 5 \times 7 = 2^2 \times 3 \times 5 \times 7$$

Highest Common Factor (H.C.F.) or Greatest Common Divisor (G.C.D.) or Greatest Common Measure (G.C.M.) are synonymous terms:

The H.C.F of two or more than two numbers is the greatest numbers which divides each of them without any remainder.

The standard formulae are as follows:

1. $LCM \times HCF = \text{product of two numbers}$. This formula can be applied only in the case of two numbers. However, if the numbers are relatively prime to each other (i.e., $HCF \text{ of numbers} = 1$), then this formula can be applied for any number of numbers.
2. $LCM \text{ of fractions} = LCM \text{ of numerator of all the fractions} / HCF \text{ of denominator of fractions}$.
3. $HCF \text{ of fractions} = HCF \text{ of numerator of all the fractions} / LCM \text{ of denominator of fractions}$.
4. $HCF \text{ of (sum of two numbers and their LCM)} = HCF \text{ of numbers}$.

Example 9 HCF of two natural numbers A and B is 120 and their product is 10,000. How many sets of values of A and B is/are possible?

Solution $HCF(A, B) = 120 \Rightarrow 120$ is a common factor of both the numbers (120 being the HCF). Hence, 120 is present in both the numbers. Therefore, the minimum product of A and B = $120 \times 120 = 14,400$. Hence, no set of A and B are possible for satisfying the conditions.

The following gives some questions based on the standard application of LCM and HCF:

Case I

Time and Work

Example 12 Tatto can do a work in 10 days and Tappo can do the same work in 12 days. How many days will it take if both start working together?

$$LCM \text{ of } 10 \text{ and } 12 = 60$$

$$\text{Efficiency of A} = 60/10 = 6$$

$$\text{Efficiency of B} = 60/12 = 5$$

$$A + B = 6 + 5 = 11$$

$$\text{Together} = 60/11$$

Case II

Time, speed, and distance – circular motion

Example 13 The speed of A is 15 m/s and speed of B is 20 m/s. They are running around a circular track of length 1000 m in the same direction. Let us find after how much time, will they meet at the starting point if they start running at the same time.

Solution Time taken by A and B in taking one circle are 66.66 s and 50 s, respectively. Therefore, $LCM(66.66, 50) = 20s$.

Case III

Number system— tolling the bell Example 14 There are two bells in a temple. Both the bells toll at a regular interval of 66.66 s and 50 s, respectively. After how much time, will they toll together for the first time?

Solution Time taken by Bell 1 and Bell 2 to toll is 66.66 s and 50 s. Therefore, $LCM(66.66, 50) = 200$ s.

Here, it can be observed that the mathematical interpretation of both the questions are same, only the language has been changed.

Case IV

Number System— Number of Rows Example 15

There are 24 peaches, 36 apricots, and 60 bananas and they have to be arranged in several rows in such a way that every row contains same number of fruits of one type. What is the minimum number of rows required for this arrangement?

Solution We can arrange one fruit in one row, and still in $(24 + 36 + 60) = 120$ rows, we can arrange all the fruits. Further, even we can arrange two fruits in one row and can arrange all the fruits in 60 rows. However, for the rows to be minimum, the number of fruits should be maximum in one row.

$HCF \text{ of } 24, 36, 60 = 12$, and therefore, 12 fruits should be there in one row.

Hence, the number of rows = 10

Case V Number System— finding remainder

Example 16 Find the lowest three-digit number that when divided by 4 and 5 gives 3 as the remainder.

Solution Let us assume that there is no remainder.

Therefore, the number has to be a multiple of LCM of 4 and 5. Now, $LCM(4, 5) = 20$



However, there is a remainder of 3 when divided by 4 and 5. Therefore, the number will be in the form of $(207N + 3)$.

Hence, numbers are 23, 43, 63, 83, 103, and so on.
Thus, the three-digit number is 103.

Previous year questions

Q1.

The LCM of two numbers is 864 and their HCF is 144. If one of the number is 288, the other number is:

- (a) 576 (b) 1296
(c) 432 (d) 144

Q2.

LCM of two numbers is 225 and their HCF is 5. If one number is 25, the other number will be:

- (a) 5 (b) 25
(c) 45 (d) 2253.

Q3.

The LCM of two numbers is 30 and their HCF is 5, One of the numbers is 10, The other is number will be :

- (a) 20 (b) 25
(c) 15 (d) 54.

Q4.

The HCF and LCM of two numbers are 13 and 455 respectively. If one of the numbers lies between 75 and 125, then, that number is:

- (a) 78 (b) 91
(c) 104 (d) 1175.

Q5.

The least number which when divided by 4, 6, 8, 12 and 16 leaves a remainder of 2 in each case is :

- (a) 46 (b) 48
(c) 50 (d) 566.

Q6.

The least number, which when divided by 12, 15, 20 or 54 leaves remainder of 4 in each case is:

- (a) 456 (b) 454
(c) 540 (d) 447.

Q7.

The maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each students get same number of pens and same number of pencils, is:

- (a) 91 (b) 910
(c) 1001 (d) 1911

Q8.

Four bells ring at intervals of 4, 6, 8 and 14 seconds, They start ringing simultaneously at 12.00 O" clock. At what time will they again ring simultaneously:

- (a) 12 hrs. 2 min. 48 sec
(c) 12 hrs. 3 min. 20 sec

Q9.

The product of the LCM and HCF of two numbers is 24. The difference of the two numbers is 2. Find the numbers?

- (a) 8 and 6 (b) 8 and 10
(c) 2 and 4 (d) 6 and 4

Q10.

The LCM of two numbers is 495 and their HCF is 5. If the sum of the numbers is 100, then their difference is:

- (a) 10 (b) 46
(c) 70 (d) 90

Q11.

Two numbers, both greater than 29, have HCF and LCM, 4147. The sum of the numbers is:

- (a) 966 (b) 696
(c) 669 (d) 666

Q12.

The H.C.F of two numbers. is 8. Which one of the following can never be their L. C.M.

- (a) 24 (b) 48
(c) 56 (d) 60

Q13.

The LCM and the HCF of the numbers 28 and 42 are in the ratio:

- (a) 6: 1 (b) 2: 3
(c) 3 : 2 (d) 7 : 2

Q14.

The LCM of two numbers is 1820 and their HCF is 26. If one number is 130 then the other number is:

- (a) 70 (b) 1690
(c) 364 (d) 1264

Q15.

The LCM of two numbers is 1920 and their HCF is 16. If one of the number is 128, find the other number:

- (a) 204 (b) 240
(c) 260 (d) 320

Q16.

The HCF of two numbers 12906 and 14818 is 478. Their LCM is :

- (a) 400086 (b) 200043
(c) 600129 (d) 800172

Q17.



Find the greatest number of five digits which when divided by 3, 5, 8, 12 leaves 2 as remainder

(a) 99990 (b) 99948

(c) 99962 (d) 99722

Q18.

The least multiple of 13, which on dividing by 4,5,6,7, and 8 leaves remainder 2 in each case is :

(a) 2520 (b) 842

(c) 2522 (d) 840

Q19.

Find the largest number of four digits such that on dividing by 15, 18, 21 and 24 the remainders are 11, 14, 17 and 20 respectively.

(a) 6557 (b) 7556

(c) 5675 (d) 7664

Q20.

4 bells ring at intervals of 30 minutes, 1 hour, $3/2$ hour and 1 hour45 minutes respectively. All the bells ring simultaneously at 12 noon. They will again ring

(a) 12 mid night

(c) 6 a.m. (d) 9 p.m.

Q21.

Four bells ring at the intervals of 5, 6, 8 and 9 seconds. All the bells ring simultaneously at some time. They will again ring simultaneously after :

(a) 6 minutes

(c) 18 minutes

Q22.

The greatest number, which when divides 989 and 1327 leave remainders 5 and 7 respectively:

(a) 8 (b) .16

(c) 24 (d) 32613

Q23.

A milkman has 75 litres milk in one cane and 45 litres in another. The maximum capacity of container which can measure milk of either container exact number :

(a) 1 litre (b) 5 litres

(c) 15 litres

Q24.

Two numbers are in the ratio 3 : 4. If their HCF is 4, then their LCM is:

(a) 48 (b) 42

(c) 36 (d) 24

Q25.

Find the least multiple of 23, which when divided by 18, 21 and 24 leaves the remainder 7, 10 and 13 respectively.

(a) 3013 (b) 3024

(c) 3002 (d) 3036

Q26.

The HCF of two numbers is 16 and their LCM is 60. If one of the number is 32, then the other number is :

(a) 48 (b) 80

(c) 96 (d) 112

Q27.

The product of two Number is 4107. If the HCF of the numbers is 37, the greater number is :

(a) 185 (b) 111

(c) 107 (d) 101

Q28.

The least perfect square, which is divisible by each of 21, 36 and 66 is:

(a) 214344 (b) 214434

(c) 213444 (d) 231444

Q29.

The least number, which when divided by 4, 5 and 6 leaves remainder 1,2 and 3 respectively, is:

(a) 57 (b) 59

(c) 61 (d) 63

(b) 3 a.m.

Q30.

Let the least number of six digits which when divided by 4, 6, 10, 15 leave in each case same remainder 2 be N.

The sum of digits in N is:

(a) 3 (b) 5

(c) 4 (d) 6

(b) 12 minutes

(d) 24 minutes

Q31.

Which is the least number which when doubled will be exactly divisible by 12, 18, 21 and 30 ?

(a) 2520 (b) 1260

(c) 630 (d) 196

Q32.

The smallest square number divisible by 10, 16 and 24 is:

(a) 900 (b) 1600

(c) 2500 (d) 3600

(d) 25 litres

Q33.

From a point on a circular track 5km long A, B and C started running in the same direction at the same time with speed of $5/2$ km per hour, 3 km per hour and 2 km per hour respectively. Then on the starting point all three will meet again after

(a) 30 hours

(c) 10 hours

Q34.

What is the least number of square tiles required to have the floor of a room 15 m 17 cm long and 9 m 20 cm broad?

(a) 840 (b) 841



(c) 820 (d) 814

Q35.

If the ratio of the two numbers is 2 : 3 and their LCM is 54, then the sum of the two number is:

(a) 5 (b) 15

(c) 45 (d) 270

Q36.

The ratio of two numbers is 4: 5 and their LCM is 120, The numbers are:

(a) 30, 40 (b) 40, 32

(c) 24, 30 (d) 36, 20

Q37.

Three numbers which are co-prime to one another 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

Q38.

HCF and LCM of two numbers are 7 and 140 respectively. If the numbers are between 20 and 45, the sum of the numbers is:

(a) 70 (b) 77

(c) 63 (d) 56

Q39.

The HCF of two numbers is 15 and their LCM is 300. If one of the number is 60, the other is:

(a) 50 (b) 75

(c) 65 (d) 100

Q40.

The HCF of two numbers is 23 and the other two factors of their LCM are 13 and 14. The larger of the numbers is :

(a) 276 (b) 299

(c) 345 (d) 322

Q41.

If the students of a class can be grouped exactly into 6 or 8 or 10, then the minimum number of students in the class must be.

(a) 60 (b) 120

(c) 180 (d) 240

Q42.

The least number which when divided by 4, 6, 8 and 9 leave zero remainder in each case and when divided by 13 leaves a remainder of 7 is:

(a) 144 (b) 72

(c) 36 (d) 85

Q43.

The number nearest to 10000, which is exactly divisible by each of 3, 4, 5, 6, 7 and 8, is :

(a) 9240 (b) 10080

(c) 9996 (d) 10000

Q44.

Let N be the greatest number that will divide 1305, 4665 and 6905 leaving the same remainder in each case. Then, sum of the digits in N is:

(a) 4 (b) 5

(c) 6 (d) 8

Q45.

The sum of two numbers is 36 and their HCF is 4. How many pairs of such number are possible?

(a) 1 (b) 2

(c) 3 (d) 4

Q46.

The greatest number, that divides 122 and 243 leaving respectively 2 and 3 as remainders is:

(a) 12 (b) 24

(c) 30 (d) 120

Q47.

The HCF and LCM of two 2-digit number are 16 and 480 respectively. The numbers are :

(a) 40, 48 (b) 60, 72

(c) 64, 80 (d) 80, 96

Q48.

The smallest number, which when divided by 12 and 16 leaves remainder 5 and 9 respectively, is :

(a) 55 (b) 41

(c) 39 (d) 29

Q49.

A number which when divided by 10 leaves a remainder of 9, when divided by 9 leaves a remainder of 8, and when divided by 8 leaves a remainder of 7, is :

(a) 1539 (b) 539

(c) 359 (d) 1359

Q50.

What is the smallest number which leaves remainder 3 when divided by any of the numbers 5, 6 or 8 but leaves no remainder when it is divided by 9 ?

(a) 123 (b) 603

(c) 723 (d) 243

Q51.

What is the least number which when divided by the number 3,5,6,8,10 and 12 leaves in each case a remainder 2 but when divided by 22 leaves no remainder?

(a) 312 (b) 242

(c) 1562 (d) 1586

Q52.



What is the greatest number that will divide 307 and 330 leaving remainder 3 and %7 respectively ?

- (a) 19 (b) 16
(c) 17 (d) 23

Q53.

The sum of the HCF and LCM of two number is 680 and the LCM is 84 times the HCF. If one of the number is 56, the other is:

- (a) 84 (b) 12
(c) 8 (d) 96

Q54.

The LCM of two numbers is 20 times their HCF. The Sum of HCF and LCM is 2520. If one of the number 480, the other number is :

- (a) 400 (b) 480
(c) 520 (d) 600

Q55.

The largest 4-digit number exactly divisible by each of 12, 15, 18 and 27 is:

- (a) 9690 (b) 9720
(c) 9930 (d) 9960

Q56.

Which greatest number will divide 3026 and 5053 leaving remainder 11 and 13 respectively?

- (a) 19 (b) 30
(c) 17 (d) 45

Q57.

The greatest number, by which 1657 and 2037 are divided to give remainders 6 and 5 respectively, is:

- (a) 127 (b) 133
(c) 235 (d) 305

Q58.

The product of two numbers is 1280 and their HCF is 8. The LCM of the number will be:

- (a) 160 (b) 150
(c) 120 (d) 140

Q59.

The least multiple of 7, which leaves the remainder 4, when divided by any of 6, 9, 15 and 18, is:

- (a) 76 (b) 94
(c) 184 (d) 364

Q60.

The largest number of five digits which, when divided by 16, 24, 30 or 36 leaves the same remainder 10 in each case, is:

- (a) 99279 (b) 99370
(c) 99269 (d) 99350

Q61.

The least number, which is a perfect square and is divisible by each of the numbers 16, 20 and 24 is:

- (a) 1600 (b) 3600
(c) 6400 (d) 14400

Q62.

The number nearest to 43582 divisible by each of 25, 50 and 75 is:

- (a) 43500 (b) 43650
(c) 43600 (d) 43550

Q63.

Three sets of English, Mathematics and Science books containing 336, 240, 96 books respectively have to be stacked in such a way that all the books are stored subject-wise and the height of each stack is the same. Total number of stacks will be:

- (a) 14 (b) 21
(c) 22 (d) 48

Q64.

Three numbers are in the ratio 2 : 3 : 4. If their LCM is 240, the smaller of the three numbers is :

- (a) 40 (b) 60
(c) 30 (d) 80

Q65.

The sum of two numbers is 45. Their difference is $\frac{1}{9}$ of their sum. Their LCM is:

- (a) 200 (b) 250
(c) 100 (d) 150

Q66.

The HCF of two numbers, each having three digits, is 17 and their LCM is 714. The sum of the numbers will be :

- (a) 289 (b) 391
(c) 221 (d) 731

Q67.

The HCF and product of two numbers are 15 and 6300 respectively. The number of possible pairs of the numbers is:

- (a) 4 (b) 3
(c) 2 (d) 1

Q68.

The smallest number, which when divided by 5, 10, 12 and 15, leaves remainder 2 in each case, but when divided by 7 leaves no remainder, is:

- (a) 189 (b) 182
(c) 175 (d) 91

Q69.

What least number must be subtracted from 1936 so that the resulting number when divided by 9, 10 and 15 will leave in each case the same remainder ?



(a) 37 (b) 36

(c) 39 (d) 30

Q70.

The least number, which when divided by 18, 27 and 36 separately leaves remainders 5, 14, 23 respectively, is :

(a) 95 (b) 113

(c) 149 (d) 77

Q71.

The smallest number, which when increased by 5 is divisible by each of 24, 32, 36 and 64, is

(a) 869 (b) 859

(c) 571 (d) 427

Q72.

Two numbers are in the ratio 3 : 4, If their LCM is 240, the smaller of the two number is :

(a) 100 (b) 80

(c) 60 (d) 50

Q73.

The product of the LCM and the HCF of two numbers is 24, If the difference of the number is 2, then the greater of the number?

(a) 3 (b) 4

(c) 6 (d) 8

Q74.

The sum of two numbers is 216 and their HCF 27. How many pairs of such number are there ?

(a) 1 (b) 2

(c) 3 (d) 0

Q75.

The LCM of two numbers is 12 times their HCF. The sum of the HCF and the LCM is 403. If one of the number is 93, then the other number is :

(a) 124 (b) 128

(c) 134 (d) 38

Q76.

The product of two numbers is 20736 and their HCF is 54. Find their LCM.

(a) 685 (b) 468

(c) 648 (d) 384

Q77.

The greatest number of four digits which when divided by 12, 16, and 24 leave remainders 2, 6 and 14 respectively is :

(a) 9974 (b) 9970

(c) 9807 (d) 9998

Q78.

When a number is divide 15, 20 or 35, each time the remainder is 8. Then the smallest number is:

(a) 428 (b) 427

(c) 328 (d) 338

Q79.

Two numbers are in the ratio 3 : 4. The product of their HCF and LCM is 2028. The sum of the numbers is:

(a) 68 (b) 72

(c) 86 (d) 91

Q80.

Sum of two numbers is 384, HCF of the numbers is 48, The difference of the numbers is :

(a) 100 (b) 192

(c) 288 (d) 336

Q81.

The LCM of two multiples of 12 is 1056. If one of the number is 132, the other number is :

(a) 12 (b) 72

(c) 96 (d) 132

Q82.

The product of two numbers is 396×576 and their LCM is 6336. Find their HCF :

(a) 36 (b) 34

(c) 63 (d) 43

Q83.

The HCF and LCM of two numbers are 8 and 48 respectively. If one of the number is 24, then the other number is:

(a) 48 (b) 36

(c) 24 (d) 16

Q84.

The HCF and LCM of two numbers are 12 and 336 respectively. If one of the number is 84, the other is :

(a) 36 (b) 48

(c) 72 (d) 96

Q85.

The product of two numbers is 216. If the HCF is 6 then their LCM is :

(a) 72 (b) 60

(c) 48 (d) 36

Q86.

The HCF and LCM of two numbers are 8 and 378 respectively. If one of the number is 54, then the other number is:

(a) 126 (b) 144

(c) 198 (d) 238

Q87.

The greatest number, which when subtracted from 5834, gives a number exactly divisible by each of 20, 28, 32 and 35, is.



(a) 1120 (b) 4714

(c) 5200 (d) 5600

Q88.

The smallest perfect square divisible by each of 6, 12 and 18 is :

(a) 196 (b) 144

(c) 108 (d) 36

Q89.

Two numbers are in the ratio 3 : 4. Their LCM is 84. The greater number is:

(a) 21 (b) 24

(c) 28 (d) 84

Q90.

The sum of two numbers is 84 and their HCF is 12. Total number of such pairs of number is :

(a) 2 (b) 3

(c) 4 (d) 5

Q91.

The sum of two numbers is 36 and their HCF and LCM are 3 and 105 respectively. The sum of the reciprocals of two numbers:

(a) $\frac{2}{35}$ (b) $\frac{3}{25}$

(c) $\frac{4}{35}$ (d) $\frac{2}{25}$

Q92.

The LCM of two numbers is 44 times of their HCF. The sum of the LCM and HCF is 1125. If one number is 25, then the other number is:

(a) 1100 (b) 975

(c) 900 (d) 800

Q93.

The HCF and LCM of two numbers are 12 and 924 respectively. Then the number of such pairs is :

(a) 0 (b) 1

(c) 2 (d) 3

Q94.

The LCM of two numbers is 520 and their HCF is 4. If one of the number is 52, then the other number is :

(a) 40 (b) 42

(c) 50 (d) 52

Q95.

The HCF of two numbers is 96 and their LCM is 1296. If one of the number is 864, the other is :

(a) 132 (b) 135

(c) 140 (d) 144

Q96.

The LCM of two numbers is 4 times their HCF. The sum of LCM and HCF is 125. If one of the number is 100, then the other number is :

(a) 5 (b) 25

(c) 100 (d) 125

Q97.

The product of two numbers is 2028 and their HCF is the number of such pair is :

(a) 1 (b) 2

(c) 3 (d) 4

Q98.

The LCM of three different numbers is 120, Which of the following cannot be their HCF ?

(a) 8 (b) 12

(c) 24 (d) 35

Q99.

The least number which when divided by 16, 18, 20 and 25 leaves 4 as remainder in each case but when divided by 7 leaves no remainder is :

(a) 17004 (b) 18000

(c) 18002 (d) 18004

Q100.

The traffic lights at three different road crossings change after 24 seconds, 36 seconds and 54 seconds respectively. If they all change simultaneously at 10: 15: 00 AM, then at what time will they again change simultaneously?

(a) 10: 16 : 54 AM

(c) 10 : 17 : 02 AM

Q101.

Find the HCF of $\frac{3}{4}$, $\frac{5}{6}$ and $\frac{6}{7}$?

(a) $\frac{5}{14}$ (b) $\frac{1}{84}$

(c) $\frac{1}{63}$ (d) $\frac{1}{168}$

Q102.

Four runners started running simultaneously from a point on a circular track. They took 200 seconds, 300 seconds, 360 seconds and 450 seconds to complete one round. After how much time do they meet at the starting point for the first time ?

(a) 1800 seconds

(c) 2400 seconds

Q103.

Three bells ring simultaneously at 11 a.m. They ring at regular intervals of 20 minutes, 30 minutes, 40 minutes respectively. The time when all the three ring together next is :

(a) 2 p.m. (b) 1 p.m.

(c) 1.15 p.m.

Q104.

A farmer has 945 cows and 2475 sheep. He farms them into flocks, keeping cows and sheep separate and having the same number of animals in each flock. If these flocks are as large as possible, then the maximum number of



animals in each flock and total number of flocks required for the purpose are respectively.

(a) 15 and 228

(c) 45 and 76

Q105.

The greatest 4-digit number exactly divisible by 10, 15, 20 is:

(a) 9990 (b) 9960

(c) 9980 (d) 9995

Q106.

The greatest number that divides 411, 684, 821 and leaves 3, 4 and 5 as remainder respectively, is :

254 (b) 146

(c) 136 (d) 204

Q107.

The ratio of two numbers is 3: 4 and their HCF is 5. Their LCM is:

(a) 10 (b) 60

(c) 15 (d) 12

Q108.

If A and B are the HCF and LCM respectively of two algebraic expressions x and y, and $A + B = x + y$, then the value of $A^3 + B^3$ is :

(a) $x^3 - y^3$ (b) x^3

(c) y^3 (d) $x^3 + y^3$

Q109.

The HCF and LCM of two numbers are 44 and 264 respectively. If the first number is divided by 2, the quotient is 44. The Other number is:

(a) 147 (b) 528

(c) 132 (d) 264

Q110.

Three men step off together from the same spot. Their steps measure 63 cm, 70 cm and 77 cm respectively. The minimum distance each should cover so that all can cover the distance in complete steps is :

(a) 9630 cm

(c) 6930 cm

Q111.

Find the greatest number which will exactly divide 200 and 320?

(a) 10 (b) 20

(c) 16 (d) 40

Q112.

84 Maths books, 90 Physics books and 120 Chemistry books have to be stacked topic wise. How many books will be there in each stack so that each stack will have the height too?

(a) 12 (b) 18

(c) 6 (d) 21

Q113.

The greatest number that will divide 729 and 901 leaving remainders 9 and 5 respectively is :

(a) 15 (b) 16

(c) 19 (d) 20

Q114.

Three numbers are in the ratio 1 : 2 : 3 and their HCF is 12. The numbers are :

(a) 12, 24, 36

(c) 4,8, 12 (d) 10, 20, 30

Q115.

If $x : y$ be the ratio of two whole numbers and z be their HCF, then the LCM of those two number is :

(a) yz (b) xz/y

(c) xy/z (d) xyz

Q116.

If the HCF and LCM of two consecutive (positive) even numbers be 2 and 84 respectively, then the sum of the numbers is:

(a) 30 (b) 26

(c) 14 (d) 34

Q117.

If $P = 2^3 \cdot 3^{10} \cdot 5$: $Q = 2^5 \cdot 3 \cdot 7$, then HCF of P and Q is:

(a) 2.3.5.7 (b) 3.2³

(c) 2².3⁷ (d) 2⁵.3¹⁰.5.7

Q118.

A fraction become $1/6$ when 4 is subtracted from its numerator and 1 is added to its denominator. If 2 and 1 are respectively added to its numerator and the denominator, it becomes $1/3$. Then, the LCM of the numerator and denominator of the said fraction, must be :

(a) 14 (b) 350

(c) 5 (d) 70

Q119.

HCF of $2/3$, $4/5$ and $6/7$ is :

(a) $48/105$ (b) $2/105$

(c) $1/105$ (d) $24/105$

Q120.

What is the greatest number which will divide 110 and 128 leaving a remainder 2 in each case?

(a) 8 (b) 18

(c) 28 (d) 38

Q121.

A milk vendor has 21 litres of cow milk, 42 litres of toned milk and 63 litres of double toned milk. If he wants to pack them in cans so that each can contains same



litres of milk and does not want to mix any two kinds of milk in a can, then the least number of cans required is :

- (a) 8 (b) 6
(c) 9 (d) 12

Q122.

The LCM of two positive integers is twice the larger number. The difference of the smaller number and the GCD of the two numbers is 4. The smaller number is:

- (a) 12 (b) 6
(c) 8 (d) 10

Q123.

The HCF (GCD) of a, b is 12, a, b are positive integers and $a > b > 12$. The smallest values of (a, b) are respectively :

- (a) 12, 24 (b) 24, 12
(c) 24, 36 (d) 36, 24

Q124.

Product of two co-prime numbers is 117. Then their LCM is :

- (a) 117 (b) 9
(c) 3 (d) 39

Q125.

The product of two numbers is 2160 and their HCF is 12. Number of such possible pairs are :

- (a) 1 (b) 2
(c) 3 (d) 4

Q126.

LCM of two number is 2079 and their HCF is 27. If one of the number is 189 , the other number is :

- (a) 297 (b) 584
(c) 189 (d) 216

Q127.

Five bells begin to toll together and toll respectively at intervals of 6, 7, 8, 9 and 12 seconds, After how many seconds will they toll together again ?

- (a) 72 sec. (b) 612 sec.
(c) 504 sec. (d) 318 sec.

Q128.

LCM of $\frac{2}{3}$, $\frac{4}{9}$ and $\frac{5}{6}$ is :

- (a) $\frac{8}{27}$ (b) $\frac{20}{3}$
(c) $\frac{10}{3}$ (d) $\frac{20}{27}$

Q129.

The least number which when divided by 6, 9, 12, 15, 18 leaves the same remainder 2 in each case is:

- (a) 180 (b) 176
(c) 182 (d) 178

Q130.

The HCF of $x^6 - 1$ and $x^4 + 2x^3 - 2x^1 - 1$ is:

- (a) $x^2 + 1$ (b) $x - 1$

- (c) $x^2 - 1$ (d) $x + 1$

Q131.

The greatest number by which 2300 and 3500 are divided leaving the remainders of 32 and 56 respectively. If,

- (a) 168 (b) 42
(c) 48 (d) 136

Q132.

Let x be the smallest number, which when added to 2000 makes the resulting number divisible by 12, 16, 18 and 21. The sum of the digits of x is :

- (a) 6 (b) 5
(c) 7 (d) 5

Q133.

Let x be the least number, which when divided by 5, 6, 7 and 8 leaves a remainder 3 in each case but when divided by 9 leaves remainder 0. The sum of digits of x is :

- (a) 24 (b) 21
(c) 22 (d) 18

Q134.

A number when divided by 361 gives remainder 47. When the same number is divided by 19 then find the remainder ?

- (a) 9 (b) 1
(c) 8 (d) 3

Q135.

The H.C.F and L.C.M of two numbers are 21 and 84 respectively. If the ratio of two numbers is 1 : 4, then the larger of the two numbers is :

- (a) 48 (b) 12
(c) 84 (d) 108

Q136.

The LCM of two numbers is 12 times their HCF. The sum of the HCF and LCM is 403. If one of the number is 93, then the other is :

- (a) 116 (b) 124
(c) 112 (d) 120

Q137.

The number of pair of positive integers whose sum is 99 and HCF is 9 is :

- (a) 5 (b) 2
(c) 3 (d) 4

Q138.

The ratio of two numbers is 3 : 4 and their LCM is 120. The sum of numbers is :

- (a) 70 (b) 35
(c) 140 (d) 105

**Q139.**

The greatest four digit number which is exactly divisible by each one of the numbers 12, 18, 21 and 28?

- (a) 9828 (b) 9882
(c) 9928 (d) 9288

Q140.

The smallest five digit number which is divisible by 12, 18 and 21 is :

- (a) 10080 (b) 30256
(c) 10224 (d) 50321

Q141.

A numbers between 1000 and 2000 which when divided by 30, 36 and 80 gives a remainder 11 in each case is :

- (a) 11523 (b) 1451
(c) 1641 (d) 1712

Q142.

The difference between the greatest and least prime numbers which are less than 100 is :

- (a) 95 (b) 96
(c) 97 (d) 94

Q143.

The number between 4000 and 5000 that is divisible by each of 12, 18, 21 and 32 is :

- (a) 4203 (b) 4023
(c) 4032 (d) 4302



ANSWER :

- | | | | | | |
|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 c | 2 c | 3 c | 4 b | 5 c | 6 d |
| 7 a | 8 a | 9 d | 10 a | 11 b | 12 d |
| 13 a | 14 c | 15 b | 16 a | 17 c | 18 c |
| 19 b | 20 d | 21 a | 22 c | 23 c | 24 a |
| 25 a | 26 b | 27 b | 28 c | 29 a | 30 b |
| 31 b | 32 d | 33 c | 34 d | 35 c | 36 c |
| 37 c | 38 c | 39 b | 40 d | 41 b | 42 b |
| 43 b | 44 a | 45 c | 46 d | 47 d | 48 b |
| 49 c | 50 d | 51 b | 52 a | 53 d | 54 d |
| 55 b | 56 d | 57 a | 58 a | 59 d | 60 b |
| 61 b | 62 b | 63 a | 64 a | 65 c | 66 c |
| 67 c | 68 b | 69 c | 70 a | 71 c | 72 c |
| 73 c | 74 b | 75 a | 76 d | 77 a | 78 a |
| 79 d | 80 c | 81 c | 82 a | 83 d | 84 b |
| 85 d | 86 a | 87 b | 88 d | 89 c | 90 b |
| 91 c | 92 a | 93 c | 94 a | 95 d | 96 b |
| 97 b | 98 d | 99 d | 100 b | 101 b | 102 a |
| 103 b | 104 c | 105 b | 106 c | 107 b | 108 d |
| 109 c | 110 c | 111 d | 112 c | 113 b | 114 a |
| 115 d | 116 b | 117 b | 118 a | 119 b | 120 b |
| 121 b | 122 c | 123 d | 124 a | 125 b | 126 a |
| 127 c | 128 b | 129 c | 130 c | 131 b | 132 c |
| 133 d | 134 a | 135 c | 136 b | 137 a | 138 a |
| 139 a | 140 a | 141 b | 142 a | 143 c | |

1. (c) $LCM \times HCF = 1^{st} \text{ Number} \times 2^{nd} \text{ number}$ or
Product of numbers = $HCF \times LCM$
→ $LCM = 864$
 $HCF = 144$
One number $x = 288$
Thus Let other no. be y
Thus,, $xy = LCM \times HCF$
→ $288 \times y = 864 \times 144$
 $y = \frac{864 \times 144}{288} = 432$
Thus, Other no. will be = 432
2. (c) $LCM = 225$
 $HCF = 5$
One number = 25
Thus, Let other number be y

Thus, $25 \times y = 225 \times 5$
 $y = \frac{225 \times 5}{25} = 45$

Thus, Another no. is 45

3. (c) $LCM = 30$
 $HCF = 5$ (given)
One number = 10
Let another number = y
Thus, $10y = 30 \times 5$
 $y = 15$
4. (b) $HCF = 13$
 $LCM = 455$
Thus, Let number be $13x$ & $13y$
Thus, $LCM = 13 \times y$
Thus, $LCM = HCF \times \text{Product of other factor}$
 $13 \times y = 455$
 $xy = \frac{455}{13} = 35$
→ $xy = 35$
Possible co-prime Factors of xy
→ $(35, 1)$ $(5, 7)$
Thus, Numbers may be
→ $35 \times 13, 1 \times 13 = (455, 13)$
or
→ $5 \times 13, 7 \times 13 = (65, 91)$
→ But it is given that one number lies between $(75 \text{ \& } 125)$ so.
→ Numbers are $(65, 91)$ and number between 75 & 125 is 91.
 LCM of $(65, 91)$ and number between 75 & 125 is 91.
5. (c) LCM of $(4, 6, 8, 12, 16)$
→ $16 \times 3 = 48$
Thus, The number when divided by $(4, 6, 8, 12, 16)$ leaves remainder 2 is = $48 + 2 = 50$
6. (d) LCM of $(12, 15, 20, 54)$
→ $4 \times 3 \times 5 \times 9 = 540$
Thus, the required number is
 $540 + 4 = 544$
→ Because when divided by LCM each is divided completely, By adding 4 in LCM leaves remainder 4.
7. (a) 1001 pens, 910 pencils (given)
 HCF of 1001, 910 is = 91
Thus, maximum no. of students are = 91
8. LCM of $4, 6, 8, 14 = 168$ seconds



2	4, 6, 8, 14
2	2, 3, 4, 7
	1, 3, 2, 7

LCM = $3 \times 2 \times 7 \times 2 \times 2 = 168$ seconds

$$= \frac{68}{60} = 2 \frac{48}{60} = 2 \text{ minute } 48 \text{ seconds}$$

Thus, 1st they start ringing at 12.00 o'clock

→ Again they ring all together after 2 minutes 48 seconds at 12 hrs. 2 min. 48 seconds.

9. (a) LCM \times HCF = 24

Thus, Product of numbers = 24

Let no. be = x, y

$$xy = 24$$

and $x - y = 2$ (given)

Factors of $xy = 24$ are (4, 6) (12, 2)

(8, 3) (24, 1)

→ Now difference between numbers be = $(x - y) = 2$

So, Factor is (4, 6)

10.

(a) LCM = 495

HCF = 5 (given)

Thus, Let numbers are = $5x$ & $5y$

Thus, LCM = $5 \times y$

$$5 \times y = 495$$

$$x \times y = 99$$

thus, Possible co-prime factors are

$$\begin{pmatrix} 1, 99 \\ 9, 11 \end{pmatrix}$$

Thus, Possible numbers are

$$5x, 5y = \begin{pmatrix} 45, 55 \\ 5, 495 \end{pmatrix}$$

Now, given that sum of numbers = 100

so, required numbers are = (45, 55)

Thus, Difference of numbers = $55 - 45 = 10$

11. (b) HCF = 29

Thus, Let numbers are $29x, 29y$

LCM = $29xy$

→ LCM = 4147 (given)

→ $29xy = 4147$

$$xy = \frac{4147}{29} = 143$$

Possible co-prime factors =

$$\begin{pmatrix} 1, 143 \\ 11, 13 \end{pmatrix}$$

Thus, Possible number are = (29, 4147), (319, 377)

= Thus, Sum of numbers = $319 + 377 = 696$

12. (d) HCF = 8

→ Now, LCM should have a factor =

So, check also the option we have only 60 which does not have a factor 8. So, it will never be the LCM.

13. (a) Numbers, $x = 28, y = 42$

HCF (28, 42)

→ Difference = $42 - 28 = 14$

→ For HCF of any numbers take their difference, HCF will be either the factor of that difference or the difference itself.

Now, LCM of 28, 42

Thus, $14 \times 2 \times 3 = 84$

→ LCM : HCF

$$84 : 14$$

$$6 : 1$$

14. (c) LCM = 1820

HCF = 26

1st. number = 130

→ LCM \times HCF = Product of numbers

→ Let the other number is x

Thus, $130 \times x = 1820 \times 26$

$$x = \frac{1820 \times 26}{130} = 364$$

15. (b) LCM = 1920

HCF = 16

1st. number = 128

Let IInd. number = x

$x \times 128 = 1920 \times 16$

$$x = \frac{1920 \times 16}{128} = 240$$

$x = 240$

16. (a) HCF = 478

Numbers are = 12906 + and 14818

Thus, LCM \times HCF = 12906×14818

LCM \times 478 = 129×14818

LCM = 400086

17. (c) LCM (3, 5, 8, 12) → $3 \times 5 \times 8 \times 3 = 120$

→ Now, greatest five digit number is 99999

On dividing 99999 by = 120 (LCM) we get remainder =



$$\frac{99999}{120}, \text{remainder} = 39$$

→ By subtracting remainder from 99999 we get the greatest five digit number which is completely divisible by given numbers (3, 5, 8, 12)

$$\text{Thus, } 99999 - 39 = 99960$$

→ Now we required the greatest five digit number which when divided by (3, 5, 8, 12) leaves remainder 2 in each case

$$\rightarrow \text{add 2 in the } 99960 = 99960 + 2 = 99962$$

18. (c) LCM (4, 5, 6, 7, 8)

$$= 4 \times 5 \times 6 \times 7 = 840$$

→ required number = $840k + 2$, which is divisible by 13,

$$\text{For } \frac{(840k+2)}{13}, (\text{remainder} = 0)$$

$$\text{Remainder} = \frac{8k+2}{13}$$

$$\text{Put } K = 3$$

$$\text{Then, remainder} = 0$$

for least multiple value of k is minimum.

$$\rightarrow \text{at } K = 3 \text{ we get } 840k + 2$$

$$= 840 \times 3 + 2$$

$$= 2520 + 2 = 2522$$

19.

(b) LCM (15, 18, 21, 24)

$$\rightarrow 5 \times 3 \times 6 \times 7 \times 4 = 2520$$

→ In such type of between given number and remainder of the number.

Number	Remainder
(15 - 11) = 4	It will be same always
(18 - 14) = 4	
(21 - 17) = 4	
(24 - 20) = 4	

Now: Largest 4 digit number is 9999

→ On dividing 9999 by LCM (2520) we get remainder → 2439

Subtract remainder from 9999 we get largest 4 digit number, which is divisible by given number = $9999 - 2439 = 7560$

But required no. gives difference on dividing so,

$$\text{Thus, Our required number} = 7560 - 4 (\text{difference}) = 7556$$

20. (d) LCM (30, 60, 90, 105)

$$\text{Thus, } 15 \times 2 \times 2 \times 3 \times 7 = 1260 \text{ minutes}$$

$$\frac{1260}{60} = 21 \text{ hours}$$

(They ring simultaneously after every 21 hours) They ring at 12 noon. So they again ring at 9 am

21. (a) LCM (5, 6, 8, 9) = $5 \times 6 \times 4 \times 3 = 360$ seconds

$$\frac{360}{60} = 6 \text{ minutes}$$

→ Bells will ring simultaneously after every 6 minutes.

22. (c) $989 - 5 = 984$

$$1327 - 7 = 1320$$

(Subtract the remainder from the number.)

$$\text{HCF} (984, 1320) = 24$$

for greatest number take HCF of the numbers

23. (a) 75 liters, 45 liters

$$\text{For minimum capacity take HCF} = (75, 45) = 15$$

24. (a) Let numbers be = x, y

$$s : y = 3 : 4 \text{ (given)}$$

$$\text{HCF} = 4$$

$$\text{Thus, Numbers are } = x = 4 \times 3 = 12$$

$$y = 4 \times 4 = 16$$

$$\text{LCM} (12, 16) = \rightarrow 4 \times 3 \times 4 = 48$$

25. (a) $18 - 7 = 11$

$$21 - 10 = 11$$

$$24 - 13 = 11$$

$$\text{take LCM} (18, 21, 24) \rightarrow 9 \times 2 \times 7 \times 4 = 504$$

$$\rightarrow \text{Required number} = (504k - 11)$$

which is divided by 23

$$\text{Thus, For } \frac{504k-11}{23},$$

Remainder should be zero

Put minimum value of k so that it completely divides 23.

$$\rightarrow \text{at } k = 6, 504k - 11 = 3013$$

Completely divisible by 23.

$$\text{Thus, Required number is } = 3013$$

26. (b) HCF = 16

$$\text{LCM} = 160$$

$$1^{\text{st}} \text{ number } 32$$

Let, Second Number = x

$$\text{Product of number} = \text{LCM} \times \text{HCF}$$

$$\text{Thus, } 32 \times x = 16 \times 160$$

$$x = \frac{16 \times 160}{32} = 80$$

27. (b) HCF = 37

Thus, Let the no. are

$$= 37x \ \& \ 37y$$

$$\text{given, } 37x \times 37y = 4107$$

$$= xy = 3$$



Possible factors of $x y = (1, 3)$

28. (c) Thus, Numbers are $= (37, 36, 66)$
 $= 21 \times 12 \times 11$
 $= 7 \times 3 \times 4 \times 3 \times 11$
 $= 7 \times 3 \times 2 \times 2 \times 3 \times 11$
 for perfect square multiply by 7×11
 So that pairs of number from perfect square

$$\text{Thus, } \underbrace{7 \times 7} \times \underbrace{3 \times 3} \times \underbrace{2 \times 2} \times \underbrace{11 \times 11}$$

required result is

$$\rightarrow 213444$$

(which is perfect square)

29. (a) $4 - 1 = 3$
 $5 - 2 = 3$
 $6 - 3 = 3$
 LCM (4,5,6) $= 4 \times 5 \times 3 = 60$
 Thus, Required number is $= 60 - 3 = 57$
30. (b) LCM (4, 6, 10, 15)
 LCM $= 2 \times 2 \times 3 \times 5 = 60$
 \rightarrow Least number of six digit
 $= 100000$
 \rightarrow divide 100000 by 60 we get remainder 40
 \rightarrow least six digit number which is divisible by (4,6,10,15) given number is
 $= (100000 + (60 - 40)) = 100020$
 Thus, Sum of digits $= 1 + 0 + 0 + 0 + 2 + 2 = 5$
31. (b) LCM (12, 18, 21, 30)
 $4 \times 3 \times 6 \times 7 \times 5 = 2520$
 So, required number
 $= \frac{2520}{2} = 1260$
32. (d) LCM (10, 16, 24)
 \rightarrow for square no. split the LCM into its factors
 $= 5 \times 2 \times 2 \times 2 \times 2 \times 3$
 $= 5 \times 5 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 3600$
33. (c) Distance $= 5$ km
 Speed of A $= 5/5$ km/hr
 Time taken by A $= \frac{5}{5} \times 2 = 2$ hours
 \rightarrow Speed of B $= 3$ km/hr
 Time taken by B $= \frac{5}{3}$ hours
 \rightarrow Speed of C $= 2$ km/hours
 Thus, Time taken by C $= \frac{5}{2}$ hours

$$\frac{\text{LCM of numerator}}{\text{HCF of denominator}} = \frac{5}{2}, \frac{5}{3}, \frac{5}{2}$$

$$\frac{10}{5}, \frac{5}{3}, \frac{5}{2}$$

$$\text{LCM} = \frac{10}{1} = 10$$

They will meet again after $= 10$ hours

34. Required number of tiles are $= \frac{\text{area of floor}}{\text{area of tiles}}$
 Sides of tiles is HCF (1517, 902) $= 41$
 Thus, area of tile $= 41 \times 41$
 No. of tile $\frac{1514 \times 902}{41 \times 41} = 814$
35. (c) Let numbers are A & B respectively
 A : B
 $2x : 3x$ (given)
 LCM $= 2 \times 3 \times x = 6x$
 According to the question,
 $6x = 54$
 $x = 9$
 Thus, A $= 2x = 2 \times 9 = 18$
 B $= 3x = 3 \times 9 = 27$
 Thus, Sum of numbers
 $= A + B = 18 + 27 = 45$
 $(3x + 2x) = 5x = 5 \times 9 = 45$
36. (c) Let numbers are A & B respectively
 A : B
 $4x : 5x$ (given)
 Thus, LCM $= 4 \times 5 \times x = 20x$
 Thus, $20x = 120$
 $x = 6$
 Thus, A $= 4x = 4 \times 6 = 24$
 B $= 5x = 5 \times 6 = 30$
37. (c) Let numbers are a,b,c
 $= a, b, c$ are co-prime numbers $= 1$
 Thus, HCF (a,b,c) $= 1$
 Thus, $a \times b = 551, b \times c = 1073$
 $\rightarrow \frac{a \times b}{b \times c} = \frac{1073}{551} = \frac{37 \times 29}{19 \times 29}$
 $\rightarrow \frac{a}{c} = \frac{37}{19}$
 \rightarrow Common 'b' factor is canceled out.
 Thus, $a = 37, b = 29, c = 19$
 Thus, Sum of numbers $= a + b + c = 37 + 29 + 19 = 85$
38. (c) HCF of number $= 0.7$
 Thus, Let the numbers are $7x$ and $7y$
 LCM $= 7xy$
 $7xy = 140$
 $xy = 20$



$$\begin{array}{r} \curvearrowright \\ -9 \end{array}$$

Thus, HCF = 9

The greatest no. is = 19

53. (d) Let HCF = x

$$\text{LCM} = 84x$$

$$\text{Thus, given HCF} + \text{LCM} = 84x + x = 680$$

$$85x = 680$$

$$x = 8$$

Thus, HCF = 8

$$\text{LCM} = 84 \times 8 = 672$$

$$\rightarrow 56 \times y = 672 \times 8$$

$$y = \frac{672 \times 8}{56} = 96$$

54. (d) Let HCF = x

Thus, LCM = 20x

$$\text{sum of HCF} + \text{LCM} = 20x$$

$$\text{Sum of HCF} + \text{LCM} = 2520$$

$$= x + 20x = 2520$$

$$x = 120$$

Thus, HCF = 120

$$\text{LCM} = 120 \times 20 = 2400$$

Thus, One number = 480

Let another number = y

$$\text{Thus, } y \times 480 = 120 \times 2400$$

$$y = \frac{120 \times 2400}{480} = 600$$

55. (b) LCM (12, 15, 18, 27)

$$\rightarrow 4 \times 3 \times 5 \times 3 \times 3 = 540$$

$$\rightarrow \text{Largest 4 digits number} = 9999$$

$$\text{On dividing by 540 to number} = \frac{9999}{540}$$

remainder is = 279

$$\text{Thus, required number} = 9999 - 279 = 9720$$

56. (d) $3026 - 11 = 3015$

$$5053 - 13 = 5040$$

$$\rightarrow \text{HCF} (3015, 5040)$$

$$\rightarrow \begin{array}{cc} 3015 & 5040 \\ \curvearrowright & \curvearrowright \\ & -2025 = (45 \times 45) \end{array}$$

\rightarrow Take difference between numbers. The HCF may be difference itself or may a factor of this difference.

$$\text{HCF} = 45$$

57. (a) $1657 - 6 = 1651$

$$2037 - 5 = 2032$$

$$2032 - 1651 \rightarrow 381 = 127 \times 3$$

$$\text{HCF} = 127$$

58. (a) Product of two numbers = 1280

$$\text{HCF} = 8$$

$$\text{LCM} = 1280/8 = 160$$

59. (d) LCM (6, 9, 15, 18) = $3 \times 2 \times 3 \times 5 = 90$

Required no. gives remainder 4 when divided by (6, 9, 15 and 18) and zero remainder when divided by '7'.

$$\frac{90K + 4}{7} = \frac{6K + 4}{7}$$

$$\text{at } K = 4, \frac{6K+4}{7} \rightarrow \text{remainder} = 0$$

$$\text{So, number is } 90K + 44 = 90 \times 4 + 4 = 364$$

we get 364 which is the required no.

60. (b) LCM (16, 24, 30, 36)

$$= 8 \times 2 \times 3 \times 5 \times 3 = 720$$

Largest 5 digits number is = 99999

divide 99999 by LCM (720)

$$= \frac{99999}{720}, \text{ we get remainder} = 639$$

So, The largest 5 digit number which divides

completely the given number is

$$= 99999 - 639 = 99360$$

$$\text{Thus, required no. is } 99360 + 10 = 99370$$

61. (b) LCM (16, 20, 24)

$$= 8 \times 2 \times 5 \times 3$$

$$= 2 \times 2 \times 2 \times 2 \times 5 \times 3 \times 5 \times 3$$

multiply by 5×3 to make pair

$$\text{Thus, The least perfect square is} = 4 \times 4 \times 15 \times 15 = 3600$$

62. (b) LCM (25, 50, 75) = $25 \times 2 \times 3 = 150$

\rightarrow Remainder when 43582 divided by 150

$$\frac{43582}{150}, \text{ we get remainder} = 82$$

$$\rightarrow \text{Two possibilities are} = 43582 - 82 = 43500$$

$$\text{or } (43582 + (150 - 82)) = 43650$$

Nearest = 43650

63. (a) HCF (336, 240, 96)

$$\begin{array}{ccc} 336 & 240 & 96 \\ \curvearrowright & \curvearrowright & \curvearrowright \\ & -96 & -144 \\ & & -48 \\ \text{HCF} & = & 48 \end{array}$$

$$\text{Thus, Stacks of English} = \frac{336}{48} = 7$$

$$\text{Stacks of maths} = \frac{240}{48} = 5$$

$$\text{Stacks of Science} = \frac{96}{48} = 2$$

$$\text{Thus, Total no. of stacks} = 7 + 5 + 2 = 14$$

64. (a) Let numbers are = 2x, 3x, 4x

$$\text{Given, LCM } (2 \times 3 \times 2)x = 12x$$

$$12x = 240 \text{ (given)}$$



$$x = 20$$

$$\text{Thus, numbers are} = 2 \times 20 = 40$$

$$3 \times 20 = 60$$

$$4 \times 20 = 80$$

Thus, smallest is 40

65. (c) $A + B = 45$

$$A - B = \frac{45}{9} = 5$$

$$\text{Thus, } A = 25, B = 20$$

$$\text{Thus, LCM } (25, 20) = 5 \times 5 \times 4 = 100$$

66. (c) $\text{HCF} = 17$

Thus, Let numbers are

$$= 17x, 17y$$

$$\text{LCM} = 17xy = 714 \text{ (given)}$$

$$xy = 42$$

possible pairs are

$$(1, 42), (2, 21), (3, 14), (6, 7)$$

Possible numbers are =

$$(17, 714), (34, 357), (51, 238), (102, 119)$$

but given that both numbers are of three digits

$$\text{Thus, numbers are} = (102, 119)$$

$$\text{Thus, sum of numbers} = 102 + 119 = 221$$

67. (c) $\text{HCF} = 15$

$$\text{Product of two numbers} = 6300$$

$$\text{Thus, Let numbers are } 15x, 15y$$

$$\text{Thus, } 15x \times 15y = 6300 \text{ (given)}$$

$$xy = \frac{6300}{15 \times 15} = 28$$

$$\text{possible pairs are} = (1, 28), (7, 4)$$

$$\text{Thus, Total pairs} = 2$$

68. (b) $\text{LCM} (5, 10, 12, 15)$

$$= 5 \times 2 \times 6 = 60$$

Smallest no. divided by (5, 10, 12, 15)

Leaves remainder 2 and when divided by 7 leaves

no remainder is

$$\frac{60K + 2}{7} - \frac{4K + 2}{7}$$

$$\text{at } K = 3, \frac{4K + 2}{7} \rightarrow \text{Remainder} = 0$$

$$\text{No.} = 60k + 2 = 60 \times 3 + 2 = 182$$

69. (c) $\text{LCM} (9, 10, 15)$

$$= 3 \times 3 \times 10 = 90$$

$$\frac{1036}{90}, \text{remainder} \rightarrow 46$$

Thus, Least number when is subtracted from

1936 which gives remainder 7 when divided by (9,

$$10, \text{ and } 15) \text{ is } = (46 - 7) = 39$$

70. (a) $18 - 5 = 13$

$$27 - 14 = 13$$

$$36 - 23 = 13$$

$$\text{Thus, LCM } (18, 27, 36) = 9 \times 2 \times 3 \times 2 = 108$$

$$\text{Required number} = 9 \times 2 \times 3 \times 2 = 108$$

$$\text{Required number} = 108 - 13 = 95$$

71. (c) $\text{LCM} (24, 32, 36, 64)$

$$\rightarrow 8 \times 3 \times 4 \times 3 \times 2 = 576$$

$$\text{Required no. is} = 576 - 5 = 571$$

72. (c) Let the number are x and y respectively

$$\text{Thus, } x : y$$

$$3 : 4$$

$$\rightarrow \text{Let } 3m : 4m$$

$$\rightarrow \text{LCM} = 3 \times 4 \times m = 240 \text{ (given)}$$

$$\rightarrow m = \frac{240}{12} = 20$$

$$\text{Thus, numbers are} = A = 3 \times 20 = 60$$

$$B = 4 \times 20 = 80$$

Thus, Least numbers is = 60

73. (c) Let numbers are m and N

$$\text{LCM} \times \text{HCF} = 4$$

$$\text{LCM} \times \text{HCF} = m \times n, \text{ But } m - n = 2 \text{ (given)}$$

so, such value is (6,4) and greater no. = 6

74. (b) $\text{HCF} = 27$

Thus, Let numbers are 27x and 27y respectively

$$\text{Thus, } 27x + 27y = 216 \text{ (given)}$$

$$\rightarrow (x + y) = \frac{216}{27} = 8$$

Only possible factors are = (1,7), (3,5)

75. (a) Let $\text{HCF} = x$

$$\text{LCM} = 12x \text{ (given)}$$

$$\text{Thus, HCF} + \text{LCM} = 13x = 403$$

$$x = 31$$

$$\text{Thus, HCF} = 31$$

$$\text{LCM} = 12 \times 31$$

One number = 93 given

Let other number is = y

$$\text{Thus, } 93 \times y = 31 \times 31 \times 12$$

$$y = 4 \times 31 = 124$$

76. (d) Let no. are a and b

$$a \times b = 20736$$

$$\text{HCF} = 54$$

$$\text{We know that } (a \times b) = (\text{HCF} \times \text{LCM})$$

$$20736 = 54 \times \text{LCM}$$

$$\text{LCM} = \frac{20736}{54} = 384$$

77. (a) $12 - 2 = 10$

$$16 - 6 = 10$$

$$24 - 14 = 10$$

$$\text{LCM } (12, 16, 24) = 6 \times 2 \times 4 \times 1 = 48$$



Greatest number of four digits = 9999
 Thus, When it is divided by 48 we get remainder = 15
 Which completely divides the given number is =
 $9999 - 15 = 9984$
 Thus, $9984 - 10 = 9974$

78.

(a) LCM (15, 20, 35)
 $= 5 \times 3 \times 4 \times 7 = 420$
 required number = $420 + 8 = 428$

79.

(d) Let the numbers are = $3x, 4x$ respectively
 Thus, HCF = x
 LCM = $3 \times 4 \times x = 12x$
 given that = HCF \times LCM = $x \times 12x = 2028$
 $12x^2 = 2028$
 $x^2 = 169$
 $x = 13$
 Thus, Sum of numbers = $3x + 4x = 7x$
 $= 7x = 7 \times 13 = 91$

80.

(c) HCF = 48
 Thus, Let number are $48x$ & $48y$ respectively
 $\rightarrow 48x + 48y = 384$
 $(x + y) = \frac{384}{48} = 8$
 So possible pairs of co-prime no. are
 (1,7), (3, 5)
 Thus, numbers are (48, 336) or (144, 240)
 \therefore difference between numbers is
 $= 336 - 48$
 $= 288$ and $240 - 144 = 96$

81.

(c) Let numbers be $12x$ and $12y$ respectively
 LCM = $12xy$
 $12xy = 1056$ (given)
 $xy = 88$
 Thus, Possible pairs are (1, 88) (8, 11)
 Possible numbers are
 $= (12, 1056) (96, 132)$
 given that one number is 132 so other is 96

82.

(a) We, know that $\rightarrow (a \times b) = (\text{HCF and LCM})$
 $396 \times 576 = \text{HCF} \times 6336$
 HCF = 36

83.

(d) HCF = 8
 LCM = 48
 One number = 24
 Let other number be = y

Thus, $24y = 48 \times 9$
 $y = 16$

84.

(b) HCF = 12
 LCM = 336
 One number = 84
 Let another number be = y
 Thus, $84y = 12 \times 336$
 $y = 48$

85.

(d) Product of number = 216
 HCF = 6
 LCM = $\frac{216}{6} = 36$

86.

(a) HCF = 18
 LCM = 378
 One number = 54
 Let another number be = y
 $\therefore 54y = 18 \times 378$
 $y = \frac{18 \times 378}{54} = 126$

87.

(b) LCM (20, 28, 32, 35)
 $\rightarrow 4 \times 5 \times 7 \times 8 = 1120$
 LCM = (20, 28, 32, 35) = 1120
 $\therefore 1120$ divided by 20, 28, 32, and 35 completely

\therefore Let x be subtracted from 5834,
 $\therefore 5834 - x = 120$
 $x = 5834 - 1120 = 4714$

88.

(d) LCM (6, 12, 18)
 LCM = $6 \times 2 \times 3 = 36$
 \rightarrow To find perfect square split the LCM into factor and make pair of factors so that it becomes the square.
 $\rightarrow \text{LCM} = 2 \times 3 \times 2 \Delta = 36$
 $2 \times 2 \times 3 \times 3 = 36$
 \rightarrow Which is already a perfect square

89.

(c) Let numbers are = $3x$ & $4x$ respectively
 LCM = 84 (Given)
 Thus, LCM of number = common factor
 (other factors)

$= x \times 3 \times 4 = 12x$
 $12x = 84$
 $x = 7$
 \therefore Numbers are = $3x = 7 \times 3 = 21$
 $4x = 7 \times 4 = 28$
 Greater number is 28

90.

(b) HCF = 12
 \therefore Let numbers are $12x$ & $12y$ respectively
 \therefore Given that $(12x + 12y) = 84$



- $\rightarrow x + y = \frac{84}{12} = 7$
 $\therefore x + y = 7$
 \rightarrow Possible factor are
 $(1 + 6), (2 + 5), (3 + 4)$
 \therefore Total factors are 3
- 91.** (c) HCF = 3
 Thus, Let numbers are $3x$ & $3y$ respectively
 LCM $\rightarrow 3xy = 105$ (given)
 $\rightarrow xy = \frac{105}{3} = 35$
 \rightarrow also given $= (3x + 3y) = 36$
 $\therefore x + y = 12$
 \therefore we required sum of reciprocals of numbers
 $\rightarrow \frac{1}{3x} + \frac{1}{3y} = \frac{x+y}{3xy}$
 $\rightarrow \frac{12}{3 \times 35} = \frac{4}{35}$
- 92.** (a) Let HCF = x
 LCM = $44x$
 given HCF + LCM = $44x + x = 45x$
 $45x = 1125$
 $x = \frac{1125}{45}$
 $x = 25$
 Thus, HCF = 25
 LCM = 25×44
 \rightarrow also given that one number = 25
 Let another number = y
 Thus, $25y = 25 \times 25 \times 44$
 $y = \frac{25 \times 25 \times 44}{25} = 1100$
- 93.** (c) HCF = 12
 Thus, Let numbers are $12x$ & $12y$ respectively
 LCM $\rightarrow 12xy = 924$ (given)
 $\rightarrow xy = 77$
 \rightarrow Possible pairs are
 $= (1 \times 77) (7 \times 11)$
 Thus, Only two pairs are possible
- 94.** (a) LCM = 520
 HCF = 4
 one number = 52
 Let other number is = y
 $\therefore 52y = 4 \times 520$
 $y = 40$
- 95.** (d) HCF = 96
 LCM = 1296
 One number = 864
 Let other number is = x
 $\therefore 864 \times x = 96 \times 1296$
 $x = 144$
- 96.** (b) Let HCF = x
 \therefore LCM = $4x$
 given HCF + LCM = 125
 $x + 4x = 125$
 $5x = 125$
 $x = 25$
 Thus, HCF = 25
 LCM = 4×25
 given one number = 100
 \rightarrow Let other number is = y
 $\rightarrow 100y = 25 \times 100$
 $y = 25$
- 97.** (b) HCF = 13
 Let number are $13x$ & $13y$ respectively
 \therefore Also given $13x \times 13y = 2008$
 $13 \times 13 \times xy = 2028$
 $xy = \frac{2028}{13 \times 13} = 12$
 \therefore Possible pairs are = $(1, 12) (3, 4)$
 Only two pairs are possible
- 98.** (d) LCM = 120 (given)
 LCM is the product of one common factor and other difference factors of the given numbers.
 \therefore factorize the given LCM
 $= 120$
 $= \frac{2 \times 2 \times 3 \times 5 \times 2}{4 (3 \times 5 \times 2)}$
 $=$ Here 4 is common factor
 (common factor is the HCF of the given number)
 Thus, HCF = 4
 So, for the given numbers the HCF should be multiple of 4
 \rightarrow Hence go through options which is not a multiple of 4 is 35.
 Hence, answer is 35.
- 99.** (d) LCM (16, 18, 20, 25)
 $\rightarrow 4 \times 4 \times 9 \times 5 \times 5 = 3600$
 \rightarrow 3600 will be completely divisible by the given number so, 4 remainder obtained by adding '4' in the LCM
 \rightarrow But it should not leave any remainder when divided by 7
 So, given number should be
 $\rightarrow \frac{3600k+4}{7} = \frac{25k+4}{7}$



$$= \frac{25k+4}{7} \text{ at } k = 5 \text{ remainder} = 0$$

at given condition satisfy.

$$\begin{aligned} \rightarrow \text{No.} &= 3600k + 4 = 3600 \times 5 + 4 \\ &= 18000 + 4 = 18004 \end{aligned}$$

- 100.** (b) LCM (24, 36, 54)
 $\rightarrow 12 \times 2 \times 3 \times 3 = 216$ seconds
 They will change simultaneously after every 216 seconds

$$\rightarrow \frac{216}{60} \rightarrow 3 \frac{36}{60} = 3 \text{ minute } 36 \text{ second}$$

They change 1st at 10:15:00 am

So, again they change at

$$= 10 : 18 : 36 \text{ am}$$

- 101.** (b) For HCF of fractions take HCF of numerators and LCM of denominators

$$\text{HCF of } 3, 5, 6 = 1$$

$$\text{LCM of } 4, 6, 7 = 84$$

$$\text{Hence, HCF of fractions} = \frac{1}{84}$$

- 102.** (a) LCM (200, 300, 360, 450)
 $\rightarrow 10 \times 4 \times 5 \times 3 \times 3 = 1800$
 \rightarrow They meet at the starting point after every 1800 seconds.

- 103.** (b) LCM (20, 30, 40)
 $\rightarrow 4 \times 5 \times 3 \times 2 = 120$ minutes
 $\rightarrow \frac{120}{60} = 2$ hours
 They 1st. bell at 11 am.
 So, the again bell after 2 hours at $11 + 2 = 1$ pm.

- 104.** (c) Cows = 945
 Sheep = 2475
 \rightarrow For largest flocks take HCF
 $\rightarrow \begin{array}{r} 945 \\ - 2475 \\ \hline -1530 \end{array}$

\rightarrow For HCF take difference of number HCF will either be the difference or its factor

$$\rightarrow 1530 = 17 \times 3 \times 3 \times 5 \times 2$$

$$= 17 \times 2 \times 45$$

$$\text{HCF} = 45$$

\therefore Maximum animals in each flock

$$= 45$$

\therefore No. of flocks of cows are

$$= \frac{945}{45} = 21$$

\rightarrow No. of flocks of sheep are

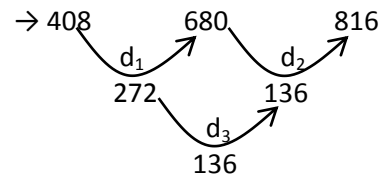
$$= \frac{2475}{45} = 55$$

$$\text{Total number of flocks} = 21 + 55 = 76$$

(45, 76)

- 105.** (b) (10, 15, 20)
 $\rightarrow 5 \times 2 \times 3 \times 2 = 60$
 \rightarrow Largest 4 digits number = 9999
 divide 9999 by LCM of given number
 \rightarrow We get remainder = 39
 \rightarrow So, to divide completely subtracted it from $(9999 - 9) = 9960$
 Thus, 9960 is the largest four digit number which is completely divided by the given numbers (9960)

- 106.** (c)
 $411 - 3 = 408$
 $684 - 4 = 680$
 $821 - 5 = 816$
 \rightarrow Take HCF of given number to get required greatest number



$$\therefore \text{HCF} = 136$$

take difference of the numbers.

- 107.** (b) HCF = 5
 Ratio of numbers is (3: 4) given
 So, numbers are = 15 & 20
 Thus, LCM = $5 \times 3 \times 4 = 60$

- 108.** (d) HCF = A (given)
 LCM = B
 given numbers are x & y respectively.

(Product of numbers is)

\rightarrow Product of numbers is

\rightarrow Product of LCM \times HCF

$\rightarrow xy = AB$

Now $\rightarrow A + B = x + y$

(given)

Take cube on both sides

$$\rightarrow (A + B)^3 = (x + y)^3$$

$$\rightarrow A^3 + B^3 + 3AB(A + B)$$

$$= x^3 + y^3 + 3xy(x + y)$$

$$\rightarrow A^3 + B^3 + 3xy(x + y)$$

$$= x^3 + y^3 + 3xy(x + y)$$

$$\text{Thus, } A^3 + B^3 = x^3 + y^3$$

(Put $AB = xy$ from above)

- 109.** (c) HCF = 44

$$\text{LCM} = 264$$

Let numbers are = x & y



$$\therefore \text{given} = \frac{x}{2} = 44$$

$$x = 88$$

$$\text{Thus, } y = \frac{\text{HCF} \times \text{LCM}}{x} \rightarrow \frac{44 \times 264}{88} \rightarrow 132$$

110. (c) for maximum distance covered LCM (63, 70, 77)

$$= 9 \times 7 \times 10 \times 11 = 6930$$

111. (d) for greatest number divide to take HCF

HCF

$$200 \quad 320$$

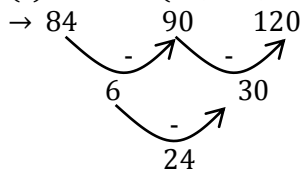
$$120 = 40 \times 3$$

(for HCF take difference or take factor of difference)

$$\text{HCF} = 40$$

(for greatest number divided by take LCM)

112. (c) HCF = (84, 90, 120)



$$\rightarrow 6 \times 4$$

$$\text{HCF} = 6$$

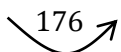
\therefore maximum no. of books in each stack = 6

113. (b) $729 - 9 = 720$

$$901 - 5 = 896$$

$$\text{HCF} (720, 896)$$

$$720 \quad 896$$



$$\rightarrow 11 \times 16$$

$$\rightarrow \text{HCF} = 16$$

114. (a) HCF = 12

given ratio of number

$$= A : B : C$$

$$1 : 2 : 3$$

Thus, Numbers are = A = 12

$$B = 12 \times 2 = 24$$

$$C = 12 \times 3 = 36$$

$$(12, 24, 36)$$

115. (d) HCF = z

given ratio of the numbers = x : y

\rightarrow LCM is the product of HCF and other factors

116. (b) Let two consecutive positive even numbers

are $(2x + 2)$ and $(2x + 4)$

$$\text{HCF} = 2 \text{ (given)}$$

common (factor)

Thus, $\text{LCM} = 2(x + 1)(x + 2)$

HCF (Other factors)

$\rightarrow \text{LCM} = 84$ given

Thus, $2(x + 1)(x + 2) = 84$

$$(x + 1)(x + 2) = 42$$

$$\rightarrow x^2 + 3x + 2 - 42 = 0$$

$$x^2 + 3x - 40 = 0$$

$$\rightarrow x(x + 8) - 5(x + 8) = 0$$

$$(x - 5)(x + 8) = 42$$

$$x = 5 \quad x = -8$$

But numbers are even, so $(x = 5)$

Thus, Number are = $2 \times 5 + 2 = 12$

$$\text{and } 2 \times 5 + 4 = 14$$

$$\rightarrow \text{Sum of numbers are} = 12 + 14 = 26$$

117. (b) $P = 2^3 \cdot 3^{10} \cdot 5$

$$Q = 2^5 \cdot 3 \cdot 7$$

$$\text{HCF} (P, Q) = (\text{common factor of } P \text{ \& } Q) = 2^3 \cdot 3$$

118. (a) Let fraction is $\frac{x}{y}$

$$\therefore \frac{x-4}{y+1} = \frac{1}{6} \text{ (given)}$$

\rightarrow Cross multiply the equation

$$\rightarrow 6x - 24 = y + 1$$

$$6x - y - 25 = 0 \dots\dots\dots (i)$$

$$\text{again, } \frac{x+2}{y+1} = \frac{1}{3} \text{ (given)}$$

$$\rightarrow 3x + 6 = y + 1$$

$$3x - y + 5 = 0 \dots\dots (ii)$$

From equation (i) and (ii)

$$6x - y = 25$$

$$3x - y = -5$$

$$\underline{x = 10}$$

Thus, $y = 35$

$$\therefore \frac{x}{y} = \frac{10}{35} = \frac{2}{7}$$

$$\text{Fraction} = \frac{x}{y} = \frac{2}{7}$$

numerator = 2

denominator = 7

LCM (numerator, denominator)

$$\rightarrow 2 \times 7 = 14$$

119. (b) HCF of fractional numbers is

HCF of numerator

LCM of denominator

$$\therefore \text{HCF} \left(\frac{2}{3}, \frac{4}{5}, \frac{6}{7} \right)$$

$$\rightarrow \frac{\text{HCF } 2, 4, 6}{\text{LCM } 3, 5, 7} = \frac{2}{3 \times 5 \times 7} = \frac{2}{105}$$

120. (b) $100 - 2 = 108$

$$128 - 2 = 126$$

Thus, HCF (108, 126) = 18

121. (b) for least or minimum number of canes we



should have maximum capacity canes for required quantity

→ From this we take HCF of given quantities.

$$\text{HCF} (21, 42, 63) = 21$$

$$\therefore \text{Maximum capacity of a cane} = 21 \text{ liters}$$

$$\therefore \text{Number of canes of cow milk} = \frac{21}{21} = 1$$

$$\therefore \text{Number of canes of toned milk} = \frac{42}{21} = 2$$

Thus, number of canes of double toned milk

$$\frac{63}{21} = 3$$

Thus, Total number of canes =

$$1 + 2 + 3 = 6$$

122. (c) G.C.D = Greatest common divisor or Highest common factor (HCF)

Let G.C.D = a

Thus, Let number are ax and ay (ax > ay)

$$\text{LCM} = axy$$

$$\rightarrow \text{LCM} = 2 \times \text{larger number}$$

$$\text{Thus, } axy = 2 \times ax$$

$$\therefore y = 2$$

also given that

$$\rightarrow \text{smaller number} - \text{G.C.D} = 4$$

$$\rightarrow ay - a = 4$$

$$2a - a = 4$$

$$a = 4$$

$$\text{G.C.D} = a = 4$$

$$y = 2$$

Thus, smaller number

$$= ay \rightarrow 2 \times 4 = 8$$

123. (d) HCF (GCD) of a, b, number is 12 and a > b > 12 (given)

Thus, Smallest value of a & b are (36, 24)

124. (a) HCF of co - prime number is always 1

Thus: Let numbers are = x & y respectively

Product of number = xy

$$xy = 117 \text{ (given)}$$

Thus, Product of number

$$= \text{LCM} \times \text{HCF}$$

$$\rightarrow \text{LCM} \times 1 = 117$$

$$\text{LCM} = 117$$

125. (b) HCF = 12

Let numbers are 12x & 12y

$$\therefore \text{Product of two number} = 12x \cdot 12y$$

$$= 144xy$$

$$\rightarrow 144xy = 2160$$

$$\rightarrow xy = 15$$

Thus, Possible pairs are (1,15), (3,5)

factors should be co-prime. Two pairs are possible.

126. (a) $\left. \begin{array}{l} \text{HCF} = 27 \\ \text{LCM} = 2079 \end{array} \right\} \text{given}$
one number = 189

Let another number be y

$$\rightarrow \text{Product of numbers} = \text{LCM} \times \text{HCF}$$

$$\text{Thus, } 189 \times y = 27 \times 2079$$

$$y = 297$$

127. (c) LCM (6, 7, 8, 9, 12)

$$\text{LCM} = 3 \times 2 \times 7 \times 4 \times 3 = 504$$

They will toll after every 504 seconds

128. (b) LCM of any fractions is

$$\rightarrow \frac{\text{LCM of numerator}}{\text{HCF denominator}}$$

$$\rightarrow \text{LCM} \left(\frac{2}{3}, \frac{4}{9}, \frac{5}{6} \right)$$

$$\rightarrow \frac{\text{LCM} (2,4,5)}{\text{HCF} (3,9,6)} = \frac{20}{3} \rightarrow \frac{20}{3} \text{ Ans.}$$

129. (c) LCM of 6,9,12 15, and 18 = 180

If 180 is divided by these given number remainder will be 0

→ To leave the same remainder 2

$$\rightarrow \text{The number will be} = 180 + 2 = 182$$

130. (c) $x^6 - 1 \rightarrow (x^2)^3 - 1^3$

$$\text{Using } \rightarrow a^3 - b^3 = (a - b)(a^2 + b^2 + ab)$$

$$\rightarrow (x^2 - 1)(x^4 + 1 + x^2 \times 1)$$

$$\rightarrow (x^2 - 1)(x^4 + 1 + x^2) \dots\dots (i) \text{ Again, } x^4 + 2x^3 - 2x - 1$$

$$\rightarrow x^4 - 1 + 2x(x^2 - 1)$$

$$\rightarrow (x^2)^2 - 1^2 + 2x(x^2 - 1)$$

$$\rightarrow (x^2 - 1)(x^2 + 1) + 2x(x^2 - 1)$$

$$\rightarrow (x^2 - 1)(x^2 + 1 + 2x) \dots\dots (ii)$$

131. (b) According to the question,

$$\begin{array}{r} 2300 \qquad 3500 \\ - 32 \qquad - 56 \\ \hline 2268 \qquad 3444 \end{array}$$

$$\curvearrowright 1176$$

Difference

$$1176 = 42 \times 28$$

So, factors of 1176 is 42, 28

Thus, HCF of 2268, 3444 is = 42

132. (c) LCM of 12, 16, 18, 21 = 1008

$$\text{Nex number} = 1008 \times 2 = 2016$$

Divisible by all

$$\therefore 16 \text{ is added}$$

$$\text{Sum of digits} = 1 + 6 = 7$$

133. (d) LCM of 5,6,7 & 8 = 840

$$\frac{840n+3}{9}$$

$$\rightarrow \frac{3n+3}{9}$$

$$\rightarrow \text{Take } n = 2$$

$$\rightarrow 3(2) + 3$$



$$\rightarrow \frac{9}{9} = \text{Remainder} = 0$$

Thus, Number is $840n + 3$

$$\rightarrow 840(2) + 3 \quad [n = 2] \rightarrow 168$$

Sum of digits = 18

134. (a) $\frac{\text{Remainder of no.}}{19} = \frac{47}{19}$
 $= [\text{Remainder} = 9]$

135. (c) We know, $\text{LCM} \times \text{HCF} = 1^{\text{st}} \text{ No.} \times 2^{\text{nd}} \text{ No.}$

Let $1^{\text{st}} \text{ No.} = K$

$2^{\text{nd}} \text{ No.} = 4K$

$$K \times 4K = 21 \times 84$$

$$K = 21$$

Then no. 21, 84

So, Larger Number = 84

136. (c) According to the question,

$$\text{LCM} = 12 \text{ HCF}$$

$$\text{HCF} + 12 \text{ HCF} = 403$$

$$13 \text{ HCF} = 403$$

$$\text{HCF} = 31$$

$$\text{LCM} = 372$$

$$\text{Thus, } \text{LCM} \times \text{HCF} = a \times b$$

$$372 \times 31 = 93 \times b$$

$$b = 124$$

137. (a) According to question,

$$\text{HCF} = 9$$

\rightarrow Then the two numbers will be

$$9a, 9b$$

$$\rightarrow 9a + 9b = 99$$

$$\rightarrow a + b = 11$$

\rightarrow Pair of positive integer

(1, 10), (2, 9), (2, 8), (1, 7) (5, 6)

138. (a) Let ratio be = x

\rightarrow Then two number will be 4x

and 3x

\rightarrow LCM of number 120

\rightarrow LCM of 4x and 3x = 12x

\rightarrow So, $12x = 120$

$$x = 10$$

\rightarrow Therefore, the sum of number is

$$= 4x + 3x$$

$$= 7x$$

$$= 7 \times 10 = 70$$

139. (a) LCM of 12, 18, 21, 28 = 252

As, we know greatest four digit number = 9999

$$= 9999 - 171$$

The number will be = 9828

140. (a) We know smallest five digit numbers is = 10000

\rightarrow LCM of 12, 18, 21 = 252

$$\begin{array}{r} 252 \overline{) 10000} \quad 39 \\ \underline{- 756} \\ 2440 \\ \underline{- 2268} \\ 172 \end{array}$$

$$\text{Difference} \rightarrow 252 - 172 = 80$$

$$\rightarrow \text{Number should be} = 10000 + 80 = 10080$$

141. LCM of 30, 36, 80 = 720

Number $720 * K + 11$ ($k=2$)

Then number = $720 \times 2 + 11$

$$1440 + 11 = 1451$$

142. (a) Greatest prime no. = 97

Least prime no. = 2

So, their difference $97 - 2 = 95$

143. LCM of 12, 18, 21, 32 = 2016

$$2016 \times K = 2016 \times 2 = 4032$$

($K = 2$)

"4032" is the number which is completely divided by 12, 18, 21, 32.