



SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)
COIMBATORE-35



DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -1 QUANTITATIVE ABILITY I

LCM &HCF

To find the LCM Questions and Answers using the prime factorization method, do the following:

- **Step 1:** Display each integer as the sum of its prime elements.
- **Step 2:** LCM will be the product of all prime factors' highest powers.

To find the LCM, multiply all prime factors. But the common factors are included only once.

To find the LCM Questions and Answers using the division method, do the following:

- **Step 1:** Begin by writing the numbers in a horizontal line separated by commas.
- **Step 2:** Next, divide all of the numbers given by the smallest prime number.
- **Step 3:** Below the previous line, write the quotients and undivided numbers in a new line.
- **Step 4:** Continue this process until we reach a point where there are no prime factors in common.
- **Step 5:** The product of all the divisors and the numbers in the final line is LCM.

For any two numbers, use the L.C.M formula:

- If we know the greatest common divisor (GCD) of two numbers, we can simply calculate LCM using the following formula:

$$\text{LCM} = \text{GCF of } (a,b) \times a \times b$$



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To find the LCM of two fractions, we must first find the LCM of the numerators and the HCF of the denominators.

Additionally, both of these outcomes will be reported as a fraction.

Thus, $LCM = \frac{H.C.F \text{ of Denominator} \times L.C.M \text{ of Numerator}}{\dots}$

HCF and LCM Formula Product of Two numbers = (HCF of the two numbers) x (LCM of the two numbers)

How to find HCF H.C.F. of Two numbers = Product of Two numbers / L.C.M of two numbers

How to find LCM L.C.M of two numbers = Product of Two numbers / H.C.F. of Two numbers

HCF by Prime Factorization Method

Take an example of finding the highest common factor of 100, 125 and 180.

Now let us write the prime factors of 100, 125 and 180.

$$100 = 2 \times 2 \times 5 \times 5$$

$$125 = 5 \times 5 \times 5$$

$$180 = 3 \times 3 \times 2 \times 2 \times 5$$

The common factors of 100, 125 and 180 are 5

Therefore, HCF (100, 125, 180) = 5

HCF by Division Method

Steps to find the HCF of any given numbers:

1. Larger number / Smaller Number
2. The divisor of the above step / Remainder
3. The divisor of step 2 / remainder. Keep doing this step till R = 0 (Zero).
4. The last step's divisor will be HCF.

LCM by Prime Factorization Method

A technique to find the Least Common Multiple (LCM) of a set of numbers by breaking down each number into its prime factors and then multiplying the highest powers of each prime factor.



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Lets take two numbers i.e., 25 and 35, now to calculate the LCM:

- List the **prime factors** of each number first.
 $25 = 5 \times 5$
 $35 = 7 \times 5$
- Then multiply each factor the **most number of times** it occurs in any number.

If the same multiple occurs more than once in both the given numbers, then multiply the factor by the most number of times it occurs.

The occurrence of Numbers in the above example:

5: two times

7: one time

$$\text{LCM} = 7 \times 5 \times 5 = 175$$

Questions and Answers of HCF and LCM

Question:

Calculate the highest number that will divide 43, 91 and 183 and leaves the same remainder in each case

Options

- A. 4**
- B. 7**
- C. 9**
- D. 13**

Solution:

Here the trick is :



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1. Find the Differences between numbers
2. Get the HCF (that differences)

We have here 43, 91 and 183

So differences are

$$183 - 91 = 92,$$

$$183 - 43 = 140,$$

$$91 - 43 = 48.$$

Now, HCF (48, 92 and 140)

- $48 = 2 \times 2 \times 2 \times 2 \times 3$
- $92 = 2 \times 2 \times 23$
- $140 = 2 \times 2 \times 5 \times 7$
- $HCF = 2 \times 2 = 4$

And 4 is the required number.

Correct Answer : A

Question:

Which of the following is greatest number of four digits which is divisible by 15, 25, 40 and 75 is:

Options

A. 9700

B. 9600

C. 9800

D. 9650



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Solution: Greatest number of 4-digits is 9999.

Now , find the L.C.M. of 15, 25, 40 and 75 i.e. 600.

On dividing 9999 by 600, the remainder is 399.

Hence, Required number $(9999 - 399) = 9600$.

Alternatively,

$$9999 \div 600 = 16.66500$$

Ignore the decimal points, required number would be $16 * 600 = 9600$

Correct Answer : B

Question:

The greatest possible length which can be used to measure exactly the lengths 7 m, 3 m 85 cm, 12 m 95 cm is:

Options

- A. 25 cm**
- B. 15 cm**
- C. 35 cm**
- D. 55 cm**

Solution: Required length = H.C.F. of 700 cm, 385 cm and 1295 cm = 35 cm.

Correct Answer : C