



PERSONALITY DEVELOPMENT ASSOCIATION
MADRAS INSTITUTE OF TECHNOLOGY
ANNA UNIVERSITY – CHENNAI

Aptitude Class No.:02

Date:25.07.2016

- 1.GCD** of a set of numbers \leq each of the numbers \leq **LCM** of the set.
- 2.GCD** is a factor of each number in the set, and each number is a factor of the **LCM**.
- The **LCM** of a set of fractions $\frac{N_1}{D_1}, \frac{N_2}{D_2}, \frac{N_3}{D_3} \dots$ is given by $\frac{LCM(N_1, N_2, N_3, \dots)}{GCD(D_1, D_2, D_3, \dots)}$
- The **HCF** of a set of fractions $\frac{N_1}{D_1}, \frac{N_2}{D_2}, \frac{N_3}{D_3} \dots$ is given by $\frac{GCD(N_1, N_2, N_3, \dots)}{LCM(D_1, D_2, D_3, \dots)}$

Note that for two numbers a and b:

- $a = \mathbf{GCD} \times$ its uncommon factors (UCF_a)
- $b = \mathbf{GCD} \times$ its uncommon factors (UCF_b)
- UCF_a and UCF_b are relatively prime
- $\mathbf{LCM} = \mathbf{GCD} \times UCF_a \times UCF_b$
- $(\mathbf{LCM} \times \mathbf{GCD}) = a \times b$
- a and b said to be relatively prime (or co- prime) if the $GCD(a, b) = 1$

Note that:

Any number ending with 2,3,7,8 cannot be a perfect square.

ILLUSTRATIONS:

1. Find the least number which leaves remainder 1, when divided by 2, 2 when divided by 3, and 3 when divided by 4.
2. Find the largest 3- digit number which leaves remainder 2 when divided by 14 or 35.
3. Find two 2- digit numbers which have $GCD=6$ and $LCM=432$.
4. Find two 2- digit number which have $GCD=6$ and product $=2880$.
5. Can there be perfect square whose digits consists of exactly four 1's, four 2's and four 0's in any order?
6. How many numbers between 400 and 800 are divisible by both 88 and 72?
a)1 b)2 c)4 d)5
7. What is the remainder when $3^3 \times 4^4 \times 5^5$ is divided by 6000?
8. I have 132 oranges, 84 apples and 144 guavas. If each type of fruit can be distributed equally amongst all the students in my class, what could be the strength of my class? What is the maximum possible strength?
9. Simplify:
a) $19^{20} \times 19^{19}$ b) $19^{20} \div 19^5$ c) $19^{20} \times 19^{10} \div 19^{15}$ d) $(19^4)^5 \times (19^2)^{10}$
e) $19^{2^3} \div [19^2]^3$ f) $19^{20} \div 19^{-10}$ g) Find m, where $9^9 = 3^m$
h) Find p and q, where $90^{90} = 9^p \times 10^{10} \times 9^q \times 10^q$ i) Find t, where $3^2 \times 9^2 = 3^t$
j) Find k, where $38^4 = 19^4 \times 4^k$
10. Compare: a) 2^{30} and 3^{20} b) $(1/4)^{50}$ and $(1/5)^{40}$ c) $\sqrt{30}$ and $\sqrt[3]{40}$
11. Convert to mixed surd: a) $\sqrt{180}$ b) $\frac{\sqrt{216} \times \sqrt{75}}{\sqrt{45}}$ c) $\sqrt[3]{250}$
12. Convert to pure surd: a) $2\sqrt{5}$ b) $3\sqrt[3]{3}$
13. Find the positive square root of: a) $3 + 2\sqrt{2}$ b) $5 + \sqrt{24}$ c) $7 - \sqrt{24}$