14 LCM & HCF

(LOWEST COMMON MULTIPLE & HIGHEST COMMON FACTOR)

IMPORTANT FORMULAS

1. Factors and Multiples

If a number 'a' is divided another number 'b' exactly, we say that 'a' is a factor of 'b'. In this case, 'b' is called a multiple of 'a'.

2. Highest Common Factor (HCF) or Greatest Common Measure (G.C.M.) or Greatest Common Divisor (G.C.D)

The HCF of two or more than two numbers is the greatest number that divides each of them exactly.

There are two methods of finding the HCF of a given set of numbers.

- I. **Factorization Method:** Express the each one of the given number as the product of prime factors. The product of least powers of common prime factors gives HCF.
- **II. Division Method:** Suppose we have to find the HCF of two given numbers, divide the larger by the smaller one. Now, divide the divisor by the remainder. Repeat the process of dividing the preceding number by the remainder last obtained till zero is obtained as remainder. The last divisor is required HCF.

Finding the HCF of more than two numbers: Suppose we have to find the HCF of three numbers, then, HCF of [(HCF of any two) and (the third number)] gives the HCF of three given number.

Similarly, the HCF of more than three numbers may be obtained.

3. Least Common Multiple (LCM):

The least number which is exactly divisible by each one of the given number is called their LCM.

There are two methods of finding the LCM of a given set of numbers:

- I. Factorization Method: Resolve each one of the given number into a product of prime factors. Then, LCM is the product of highest powers of all the factors.
- **II. Division Method (short-cut):** Arrange the given numbers in a row in any order. Divide by a number which divided exactly at least two of the given numbers and carry forward the numbers which are not divisible. Repeat the above process till no two of the numbers are divisible by the same number except first The product of the divisors and the undivided numbers is the required LCM of the given numbers.

4. Product of two numbers = Product of their HCF and LCM

5. **Co-primes:** Two numbers are said to be co-primes if their HCF is 1.

6. HCF and LCM of Fractions:

1. HCF = $\frac{\text{H.C.F. of Numerators}}{\text{L.C.M. of Denominators}}$

2. LCM = $\frac{\text{L.C.M.of Numerators}}{\text{H.C.F.of Denominators}}$

7. HCF and LCM of Decimal Fractions:

In a given numbers, make the same number of decimal places by annexing zeros in some numbers, if necessary. Considering these number to decimal point, find HCF or LCM as the case may be.

Now, in the result, mark off as many decimal places as are there in each of the given numbers.

8. Comparison of Fractions

Find the LCM of the denominators of the given fractions, Convert each of the fractions into an equivalent fraction with LCM as the denominator, by multiplying both the numerator and denominator by the same number. The resultant fraction with the greatest numerator is the greatest.

EXAMPLES

 Find the greatest weight which can be contained exactly in 6 kg 7 hg 4 dg 3g and 9 kg 9 dg 7 g.

(a) 11 g (b) 27 g

(c) 12 g (d) 17 g

Sol. (a) 6kg 7hg 4dg 3g = 6000g + 700g + 40g + 3g = 6743g

9kg 9dg 7g

= 9000 + 90 g + 7 g

= 9097g

HCF of 6743g 9097g

2354=11×214

11 g is the greatest weight that can be contained exactly in 6743 g and 9097g

- Find the greatest measure which is exactly contained in 10 litres 857 millilitres and 15 litres 87 millilitres.
 - (a) 140 ml (b) 138 ml
 - (c) 141 ml (d) 142 ml
- Sol. (c) 1 litre = 1000 millilitres



Now, HCF will be the factor of this number

4230 = 141 × 30

- Greatest number will be 141 ml (check through options)
- 3. A man bought a certain number

of mangoes Rs. 14.40, he gained 44P by selling some of them for Rs. 8. Find at least how much mangoes he had left with. (a) 19 (b) 36 (c) 38 (d) 21 Sol. (a) Cost price of all the mangoes = 14.40& cost price of sold mangoes = 8–0.44 = ` 7.56 = 756 p. Now, HCF of 1440 & 756 = 36p Therefore, least number of mangoes he had left $=\frac{(1440-756)}{36}=19$ Find the LCM of 40.36 and 126. 4 (a) 2220 (b) 2520 (d) 2020 (c) 2624 Sol. (b) $40 = 2 \times 2 \times 2 \times 5 = 2^3 \times 5$ $36 = 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2$ $126 = 2 \times 3 \times 3 \times 7 = 2 \times 3^2 \times 7$ To Calculate LCM, we the highest power factors & the Remaining numbers. Required LCM \ $= 2^3 \times 3^2 \times 5 \times 7 = 2520$ find the LCM of 112,140 and 168. 5. (a) 1580 (b) 1680 (c) 1720 (d) 1600 Sol. (b)112 = $2 \times 2 \times 2 \times 2 \times 7 = 2^4 \times 7$ $140 = 2 \times 2 \times 5 \times 7 = 2^2 \times 5 \times 7$ $168 = 2 \times 2 \times 2 \times 3 \times 7 = 2^3 \times 3 \times 7$ Required LCM = $2^4 \times 3 \times 5 \times 7$ \ = 1680 6. Find the LCM of 2.4, 0.36 and 7.2. (a) 7.2 (b) 5.2 (c) 1.2 (d) 4.2 Sol. (a) To calculate the LCM of decimal integers, make the decimal integers into whole numbers multiplying with any friendly numbers i.e 10, 100, 1000 ...etc. Given 2.4, 0.36, 7.2

we multiply it by 100 to make whole number, we get \ 240.36 & 720 Now. LCM of 240, 36 & 720 = 720 We multiply the numbers with 0 100, hence divide the LCM by 100 to get required LCM. LCM of (2.4, 0.36 & 7.2) = $\frac{720}{100}$ \ = 7.27. Find the LCM of 0.18,2.4 and 60. (a) 360 (b) 240 (c) 180 (d) 720 Sol. (c) we can write (0.18, 2.4, 60) as 18, 240, 6000 LCM of 18, 240, 6000 = 18000Hence LCM of 0.18, 2.4 and 60 $=\frac{18000}{100}=180$ Find the LCM of 20,2.8 and 8. 0.25. (a) 700 (b) 140 (c) 600 (d) 1000 Sol. (b) we can write 20, 2.8 & 0.25 as 2000, 280 & 25 LCM of 2000, 280 & 25 = 14000 LCM of 20, 2.8 & 0.25 \ $=\frac{14000}{100}=140$ 9. Find the HCF of $\frac{3}{4}$, $\frac{5}{6}$ and $\frac{6}{7}$. (a) $\frac{1}{84}$ (b) $\frac{1}{42}$ (d) $\frac{5}{40}$ (c) $\frac{1}{21}$ Sol. (a) HCF of fraction HCF of numerators LCM of denominators HCF of $(\frac{3}{4}, \frac{5}{6}, \frac{6}{7})$ $= \frac{\text{HCF } (3,5,6)}{\text{LCM } (4,6,7)} = \frac{1}{84}$ 10. Find the HCF of $\frac{6}{8}$, $2\frac{1}{2}$ and $\frac{15}{16}$.

(a) $\frac{1}{31}$ (b) $\frac{1}{16}$ (c) $\frac{15}{32}$ (d) $\frac{1}{15}$ Sol. (b) HCF $\frac{6}{8}$, $\frac{5}{2}$, $\frac{15}{16}$ $= \frac{\text{HCF } (6,5,15)}{\text{LCM } (8,2,16)} = \frac{1}{16}$ 11. Find the LCM of 8, $\frac{16}{20}$ and $1\frac{3}{7}$. (a) 80 (b) 40 (c) $\frac{1}{80}$ (d) $\frac{1}{20}$ Sol. (a) LCM (8, $\frac{16}{20}$, $\frac{10}{7}$) $= \frac{\text{LCM } (8,16,10)}{\text{HCF } (1,20,7)} = 80$ 12. Find the LCM of $1\frac{37}{78}$, $2\frac{54}{65}$ and $5\frac{35}{39}$ (a) $72\frac{10}{13}$ (b) $71\frac{10}{12}$ (c) $\frac{921}{13}$ (d) $70\frac{10}{13}$ Sol. (d) LCM $\underbrace{\overset{\text{al}}{\underbrace{}}_{\underline{5}} 15}_{\underline{5}}, \frac{184}{65}, \frac{230}{39} \underbrace{\overset{\text{o}}{\underline{5}}}_{\underline{7}}$ $= \frac{\text{LCM (115,184,230)}}{\text{HCF (78,65,39)}} = \frac{920}{13}$ $= 70 \frac{10}{13}$ 13. The LCM of two numbers is 64699, their GCM or (HCF) is 97 and one of the numbers is 2231. Find the other. (a) 2183 (b) 2813 (c) 2831 (d) 2381 Sol. (b) Product of two numbers = HCF \times LCM Let the other number be x

 $(2231 \times x = 97 \times 64699)$

\ 97′64699 x x = 281314. The HCF of two numbers each consisting of four digits is 103, and their LCM is 19261, find the number (a) 1133,1751 (b) 1313,1571 (c) 1331,1751 (d) 1133,1715 Sol. (a) HCF of four digits number is 103 Hence, the number can be 103x and 103 y where x and y are prime to each other Now, First number×second number = HCF×LCM $103x \times 103y = 103 \times 19261$ $p xy = \frac{103' 19261}{103' 103}$ p xv = 187The possible pairs of x and y, satisfying the condition xy = 187 is (17, 11)Two numbers \ = 103×17, 103×11 = 1751, 1133 15. The HCF of two numbers is 99 and their LCM is 2772. The numbers are (a) 198,1386 (b) 198,297 (c) 297,495 (d) None of these Sol. (d) The numbers can be 99xand 99y, where x and y are prime to each other now, first no. × second no. = HCF \times LCM $p 99x \times 99y = 99 \times 2772$ $p xy = \frac{99' 2772}{99' 99}$ $xy = \frac{2772}{99}$ xv = 28The possible pairs of x and y. Satisfying the condition xy = 28 are (7, 4) and (1, 28)

 $99 \times 7 = 693$ $99 \times 4 = 396$ 16. The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 80, then the other is-(a) 160 (b) 60 (c) 40 (d) 280 Sol. (d) LCM = 14 HCF (Given) & LCM + HCF = 600▶ 14 HCF + HCF = 600 ▶ 15 HCF = 600 ▶ HCF = 40 Now, one number is given 80 Let other number be xProduct of 2 number = **HCF×LCM** $80 \times x = 40 \times 560$ x = 28017. The HCF of two numbers is 1/5th of their LCM. If the product of the two numbers is 720, the HCF is-(a) 20 (b) 12 (c) 15 (d) 18 Sol. (b) HCF = $\frac{1}{5}$ LCM \blacktriangleright LCM = 5 HCF Product of 2 numbers = 720Product of 2 numbers = HCF×LCM ▶ 720 = HCF×5HCF $144 = x^2$ p x = 12Hence HCF = 1218. Two numbers have 16 as their HCF and 146 as their LCM. Then, one can say that; (a) Many such pairs of numbers exist. (b) Only one such pair of numbers exists. (c) No such pair of numbers exists. (d) Only two such pairs of numbers exist.

Two numbers

Sol. (c) HCF of two numbers is 16 Number can be 16x and 16ywhere x and y are prime LCM = 146Product of 2 numbers = HCF ×LCM $16x \times 16y = 16 \times 146$ $xy = \frac{146}{16}$ xy = 9.125(not a whole no.) No such pair is possible 19. What is the greatest number that will exactly divide 96, 528 and 792? (a) 12 (b) 48 (c) 36 (d) 24 Sol. (d) At the Ist step, we take the no. 96, 528 96) <u>528 (</u>5 480 48 96(2

Again, HCF of 48 & 792



Hence greastest number = 24

Alternate

To find the HCF of the numbers we take difference of consecutives no. & then factorise it.



Checking by option, greatest no. will be = 24

20. What is the greatest number that will exactly divide 48,168,324 and 1400?

(a) 14	(b) 4
(c) 16	(d) 8

Sol. (b) Given 48, 168 324 & 1400

we taken smallest difference in these number and then factorise it

Hence



Hence, the greatest no. = 4

- 21. What is the greatest number that will divide 2930 and 3250 and will leave as remainders 7 and 11 respectively ?
 - (a) 69 (b) 59
 - (c) 97 (d) 79
- Sol. (d) HCF of (2930–7) & (3250–11) HCF of (2923 & 3239) = 79 HCF = 79

Hence greatest number = 79

- 22. What is the greatest number that will divide 29,60 and 103 and will leave as remainders 5,12 and 7 respectively?
 - (a) 24 (b) 16
 - (c) 12 (d) 14
- Sol. (a) HCF of (29–5), (60–12) & (103–7) HCF of 24, 48 & 96

HCF = 24 = Greatest Number

- 23. What is the greatest number that will divide 130,305 and 245 and will leave as remainders 6,9 and 17 respectively?
 - (a) 4 (b) 8
 - (c) 5 (d) 24
- Sol. (a) HCF of (130–6), (305–9) & (245–17) HCF of 124, 296 & 228 = 4

HCF = 4 = Greatest Number

- 24. Find the least number which is exactly divisible by 15,55 and 99.
 - (a) 485 (b) 495

(c) 435 (d) 395

Sol. (b) The least Number which is

exactly divisible is L.C.M of these Number.

LCM of -(15, 55 & 99) = 495

- 25. Find the smallest number which is exactly divisible by 999 and 9999.
 - (a) 1199889 (b) 1109989
 - (c) 1109999 (d) 1109889
- Sol. (d) LCM of 999 & 9999 = 1109889
- 26. What is the smallest number which when increased by 3 is divisible by 27,35,25 and 21 ?
 - (a) 4725 (b) 4722
 - (c) 4723 (d) 4728
- Sol. (b) LCM of (27, 35, 25 & 21) = 4725

smallest number which when increased by 3 is divisible is

- = 4725–3 = 4722
- 27. What is the least number which when decreased by 5 is divisible by 36,48,21 and 28 ?
 - (a) 1008 (b) 1003
 - (c) 1013 (d) 1023
- Sol. (c) LCM of (36, 48, 21 & 28) = 1008

Hence smallest number which when decreased by 5 is exactly divisible = 1008 + 5 =1013

28. What greatest number can be subtracted from 10000, so that the remainder may be divisible by 32,36,48 and 54 ?

(a) 9136 (b) 9316

- (c) 1360 (d) 8640
- Sol. (a) LCM of (32, 36, 48 & 54) = 864

Greatest number will be 10000-864 = 9136

- 29. Find the least number which when divided by 24,32 and 36 leaves the remainders 19,27 and 31 respectively.
 - (a) 283 (b) 823
 - (c) 382 (d) 238
- Sol. (a) In this type of question the difference between the divisor & the corresponding remainder

is same in each case i.e 24-19=5, 32-27 = 5, 36-31=5

Required number

= (LCM of 24,32 and 36)-5

= (288–5) = 283

30. Find the greatest number of six digits which on being divided by 6,7,8,9 and 10 leaves 4,5,6,7 and 8 as remainder respectively.

(a) 997920 (b) 997918

- (c) 998918 (d) 999918
- Sol. (b) The difference b/w the divisor & the corresponding remainder in each case i.e. 6-4=2, 7-5=2, 8-6, = 2, 9

-7 = 2, 10 - 8 = 2

Now LCM of 6, 7, 8, 9, 10 = 2520

The greatest six digit number exactly divisible by 2520

= 997920

Required no = 997920 - 2

- 31. What is the least multiple of 7, which when divided by 2,3,4,5, and 6 leaves the remainders 1,2,3,4 and 5 respectively.
 - (a) 119 (b) 126
 - (c) 112
 - (d) Can't be determined
- Sol. (a) The difference b/w the divisor & the corresponding remainder in each case i.e.

2 - 1 = 1, 3 - 2 = 1, 4 - 3 = 1, 5- 4 = 1, 6 - 5 = 1

 $\land Required no = 60k - 1$

Which is multiple of 7

= 56k + 4k - 1

- Now Put value of K = 1, 2, 3, 4, 5, 6, i.e,
- = 60 × 2 1 = 119
- 32. Find the greatest number of six digits which when divided by 5,7,12 and 15 leaves respectively remainders 3,5,10 and 13.
 - (a) 999600 (b) 999596
 - (c) 999598 (d) 999602
- Sol. (c) The difference b/w the divisor & the corresponding remainder in each case i.e,

5 - 3 = 2, 7-5 = 2, 12-10 = 2&15-13=2

Now LCM of 5, 7, 12 & 15 = 420 LCM = 420

The greatest six digit number exactly divisible by 420 is 999600

So, required number after substracting common remainder is

- = 999600 2 = 999598
- 33. Find the least number which when divided by 18,24,30 and 42, will leave in each case the same remainder 1.
 - (a) 2523 (b) 2521
 - (c) 2520 (d) 2519
- Sol. (b) LCM of (18, 24, 30 & 42) = 2520 Required no.= 2520+1

= 2521

- 34. What smallest number must be subtracted from 7894135 so that the remainder when divided by 34,38,85 and 95 leaves the same remainder 11 in each case.
 - (a) 6 (b) 8
 - (c) 4 (d) 3241
- Sol. (c) LCM of (34, 38, 85 & 95) = 3230

After dividing 7894135 by 3230 we get 15 as a remainder.

But the remainder should be 11.

Hence, the required smallest number that must be subtracted = 15-11 = 4

- 35. What is the least multiple of 17, which leaves a remainder of 1, when divided by each of the first twelve integers except unity ?
 - (a) 27720 (b) 138601
 - (c) 138599 (d) 27719
- Sol. (b) LCM of first twelve integers excepting unity = 27720

The required no. is of form (27720 k+1), that leave remainder 1 in each case

17) 27720 k+1 (1630 k 277<u>10 k</u> 10 k +1 (10k+1) is remainder on dividing by 17

Now we find the least positive number for which 10k+1 is divisible by 17 by checking k = 5

- Required no = 27720 × 5 + 1 = 138601
- 36. Find the least number of six digits which when divided by 4,6,10 and 15, leaves in each case the same remainder 2.
 - (a) 10020 (b) 10018
 - (c) 10022
 - (d) Can't be determined
- Sol. (d) The least no. of six digit is = 100000
 - LCM = (4, 6, 10 & 15) = 60

After dividing 100000 By 60 we get that if we add 20 then number is exactly divisible by 60.

So In order to get 2 as remainder in each case we will simply add 2 to 100020

Least number is

- = 100020+2
- = 100022
- 37. Find the greatest number which is such that when 12288,19139 and 28200 are divided by it, the remainders are all the same
 - (a) 222 (b) 221
 - (c) 121 (d) 122
- Sol. (b) In this type of question, firstly you find out the difference of these No. & then HCF of these number



HCF of (6851, 9061, 15912) = 221

38. Find the greatest number which is such that when 76,151 and 226 are divided by it, the remainders are all alike Find also the common remainder..

(a) 57,2 (b) 75,2

(c) 75,1 (d) 57,1

Sol. (c)In this type of question, first you find the difference of given number & then HCF of these numbers.

Difference of number:-



HCF of 75, 75, 150 is = 75

So 75 is the greatest number which when divided by these number the remainder is same & when we divide 76 by 75 we find 1 is remainder.

39. Which of the following numbers gives the same remainder when it divides 1110 and 864.

(a) 123 (b) 213

- (c) 245 (d) 132
- Sol. (a) In these types of question if only two digit is given then we just take the difference between them and factorize it

So



difference \rightarrow 246 = 2×123

Hence, required number = 123

40. Find the greatest 3-digit number such that when divided by 3,4 and 5, it leaves remainder 2 in each case.

(a) 122 (b) 962

(c) 958 (d) 118

Sol. (b)The greatest three digit number is 999

LCM of (3, 4, 5) = 60

After dividing 999 by 60, we get 39 as remainder

999-39 = 960 is the greastest 3-digit number divisible by the given divisor

In order to get 2 as remainder in each case we will simply add 2 to 960

Greatest no

= 960 + 2 = 962

41. Find the greatest number of 4 digits which, when divided by

188

16,24 and 36 leaves 4 as a remainder in each case.

- (a) 9936 (b) 9932
- (c) 9940 (d) 9904
- Sol. (c) The greatest 4 digit number is 9999

LCM of (16, 24, 36) = 144

After dividing 9999 by 144 we get 63 as remainder.

9999-63 = 9936 is the greatest 4-digit no which is exactly divisible by the given divisor

In order to get 4 as remainder in each case we will simply add 4 to 9936

greatest number = 9936 + 4 = 9940

- 42. Find the smallest 3-digit number, such that it is exactly divisible by 3,4 and 5.
 - (a) 105 (b) 115
 - (c) 120 (d) 130

Sol. (c) LCM of
$$(3, 4 \& 5) = 60$$

smallest 3-digit number is 100 on dividing it by 60 we find that it is completely divisible when 20 is added in it.

So 120 is smallest 3-digit number which exactly divisible by given number

- 43. Find the smallest 3-digit number, such that when divided by 3,4 and 5, it leaves remainder 2 in each case.
 - (a) 118 (b) 120
 - (c) 122 (d) 132
- Sol. (c) LCM of (3, 4 & 5) = 60

smallest 3-digit no is 100 on dividing it by 60 we find that it is completely divisible when 20 is added in it so exactly divisible number = 120

In order to get 2 as remainder in each case we will simply add 2 to 120

So number is 122

44. Find the least number of five digits which when divided by 52,56,78 and 91 leaves no remainder.

- (a) 10920 (b) 19020
- (c) 10290 (d) 10820
- Sol. (a) least no of 5 digit is 10000

LCM of (52, 56, 78, 91)= 2184

on dividing 10000 by 2184 we find that after adding 920 in it will be exactly divisible by 2184.

$$2184) 10000 (4) \\ 8736 \\ 1264$$

Hence required number

= 10000 + 920 = 10920

- 45. Find the least number which being divided by 2,3,4,5,6 leaves in each case a remainder 1, but when divided by 7 leaves no remainder.
 - (a) 301 (b) 201
 - (c) 302 (d) 310
- Sol. (a) The LCM of (2, 3, 4, 5 & 6) = 60 Required number is = 60k+1 which is exactly divisible by 7 for some value of k. on dividing by 7 = 56k + 4k+1 put the value of k = 1, 2, 3, 4, 5 when we put the value of k = 5 then we get exactly divisible value by 7, = 60 × 5 + 1 Required number = 301
- 46. A heap of pebbles can be made up exactly into groups of 25, but when made up into groups of 18,27 and 32, there is in each case a remainder of 11, find the least number of pebbles such a heap can contain.
 - (a) 775 (b) 975
 - (c) 785 (d) 875
- Sol. (d) The LCM of (18, 27 & 32) = 864 so required number = 864k+11 which is exactly divisible by 25.

= 34 k +14k + 11

by puting k =1, this number is completely divisible by 25

hence, required number

 $= 864 \times 1 + 11 = 875$

47. There are 4 numbers. The HCF of each pair is 7 and the LCM of all the 4 numbers is 1470.

What is the product of 4 numbers?

- (a) 504210 (b) 502410
- (c) 504120
- (d) Can't be determined
- Sol. (a) In this type of question we use this formula

 $(HCF)^{n-1} \times LCM$ So (7)⁴⁻¹ ×1470 = 7³ × 1470 = 343 × 1470

= 504210

48. There are 4 numbers. The HCF of each pair is 5 and the LCM of all the 4 numbers is 2310. What is the product of 4 numbers ?

(a) 288750 (b) 288570

(c) 828570 (d) 288650

Sol. (a) In this type of question, use this formula product = (HCF)ⁿ⁻¹× LCM

 $= (5)^{4-1} \times 2310 = 5^3 \times 2310$

= 125×2310 = 288750

- 49. There are 3 numbers. The HCF of each pair is 2 and the LCM of all the 3 numbers is 210. What is the product of 3 numbers?
 - (a) 840 (b) 480
 - (c) 740 (d) 850
- Sol. (a) In this type of question use this formula

Product of the number

= $(HCF)^{n-1} \times LCM$

$$= (2)^{3-1} \times 210 = 2^2 \times 210$$

= 4×210 = 840

- 50. In a school 391 boys and 323 girls have been divided into the largest possible equal classes, so that there are equal number of boys and girls in each class. What is the number of classes ?
 - (a) 23 girl's classes, 19 boy's classes
 - (b) 23 boy's classes, 19 girl's classes
 - (c) 17 boy's classes, 23 girl's classes
 - (d) 23 boy's classes, 17 girls' classes

Sol. (a) HCF of (391 & 323) = 17

Divide this student by 17 (HCF). You can get the number of boys = $391\div17 = 23$ boy's classes

Girls = 323/17 = 19 girl's classes

Exercise

- 1. 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
- 2. 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) 225
- 3. 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) 5
- 4. 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) 117
- 5. 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) 56
- 6. The least number, which when divided by 12, 15, 20 or 54 leaves a remainder of 4 in each case is :
 - (a) 456 (b) 454
 - (c) 540 (d) 544
- 7. The maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets same number of pens and same

number of	pencils, is :
(a) 91	(b) 910
(c) 1001	(d) 1911

- 8. 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
 - (b) 12 hrs. 3 min.
 - (c) 12 hrs. 3 min. 20 sec
 - (d) 12 hrs. 3 min. 44 sec
- 9. 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
- 10. 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
- 11. Two numbers, both greater than 29, have HCF 29 and LCM 4147. The sum of the numbers is :
 - (a) 966 (b) 696
 - (c) 669 (d) 666
- 12. The H.C.F. of two numbers is8. Which one of the following can never be their L.C.M ?
 - (a) 24 (b) 48
 - (c) 56 (d) 60
- 13. The LCM and the HCF of the numbers 28 and 42 are in the ratio :(a) 6 + 1

(a) 6 : 1	(D) 2 : 3
(c) 3 : 2	(d) 7 : 2

- 14. 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
- 15. 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
- 16. The HCF of two number 12906 and 14818 is 478. Their LCM is:
 (a) 400086 (b) 200043
 (c) 600129 (d) 800172
- 17. Find the greatest number of five digits which when divided by 3, 5, 8, 12 leaves 2 as remainder
 - (a) 99999 (b) 99948
 - (c) 99962 (d) 99722
- 18. 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
- 19. 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
- 20. 4 bells ring at intervals of 30

minutes, 1 hour, $1\frac{1}{2}$ hour and

1 hour 45 minutes respectively. All the bells ring simultaneously at 12 noon. They will again ring simultaneously at:

LCM and HCF

- (a) 12 mid night (b) 3 a.m.
- (c) 6 a.m. (d) 9 a.m.
- 21. 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 (b) 12 minutes

(c) 18 minutes (d) 24 minutes

- 22. The greatest number, which when divides 989 and 1327 leave remainders 5 and 7 respectively:
 - (a) 8 (b) 16
 - (c) 24 (d) 32
- 23. 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 (d) 25 litres
- 24. Two numbers are in the ratio3 : 4. If their HCF is 4, then their LCM is
 - (a) 48 (b) 42
 - (c) 36 (d) 24
- 25. 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
- 26. The HCF of two numbers is 16 and their LCM is 160. If one of the number is 32, then the other number is :
 - (a) 48 (b) 80
 - (c) 96 (d) 112
- 27. 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
- 28. The least perfect square, which is divisible by each of 21, 36 and 66 is:
 - (a) 214344 (b) 214434

(c) 213444 (d) 231444

29. 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
- 30. Let the least number of six digits which when divided by 4, 6, 10, 15 leaves in each case same remainder 2 be N. The sum of digits in N is:
 - (a) 3 (b) 5
 - (c) 4
- 31. Which is the least number which when doubled will be exactly divisible by 12, 18, 21 and 30?(a) 2520 (b) 1260

(d) 6

- (c) 630 (d) 196
- 32. The smallest square number divisible by 10, 16 and 24 is:(a) 900 (b) 1600
 - (c) 2500 (d) 3600
- 33. From a point on a circular track 5 km long A, B and C started running in the same direction at the same time

with speed of $2\frac{1}{2}$ 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 (b) 6 hours
- (c) 10 hours (d) 15 hours
- 34. What is the least number of square tiles required to pave the floor of a room 15 m 17 cm long and 9 m 2 cm broad ?
 - (a) 840 (b) 841
 - (c) 820 (d) 814
- 35. 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
- 36. 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

- 37. Three numbers which are coprime 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
- 38. 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
- 39. 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
- 40. The HCF of two numbers is 23 and the other two factors of their LCM are 13 and 14. The larger of the two numbers is :
 - (a) 276 (b) 299
 - (c) 345 (d) 322
- 41. 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
- 42. 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
- 43. 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
- 44. 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
- 45. The sum of two numbers is 36 and their HCFis 4. How many pairs of such number are posible?
 - (a) 1 (b) 2
 - (c) 3 (d) 4
- 46. The greatest number, that divides 122 and 243 leaving respectively 2 and 3 as remainders is:
 - (a) 12 (b) 24
 - (c) 30 (d) 120
- 47. 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
- 48. 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
- 49. 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
- 50. 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
- 51. 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

52. 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
- 53. 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
- 54. 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
- 55. The largest 4-digit number exactly divisible by each of 12, 15, 18 and 27 is:
 - (a) 9690 (b) 9720
 - (c) 9930 (d) 9960
- 56. Which greatest number will divide 3026 and 5053 leaving remainders 11 and 13 respectively?
 - (a) 19 (b) 30
 - (c) 17 (d) 45
- 57. 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
- 58. 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
- 59. 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

- 60. 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

- 61. 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
- 62. The number nearest to 43582 divisible by each of 25, 50 and 75 is:
 - (a) 43500 (b) 43650
 - (c) 43600 (d) 43550
- 63. 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 subjectwise and the height of each stack is the same. Total number of stacks will be:
 - (a) 14 (b) 21
 - (c) 22 (d) 48
- 64. 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

65. 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
- 66. 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
- 67. 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

- 68. 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
- 69. 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 7?
 - (a) 37 (b) 36
 - (c) 39 (d) 30
- 70. The least number, which when divided by 18, 27 and 36 separately leaves remainders5, 14, 23 respectively, is
 - (a) 95 (b) 113
 - (c) 149 (d) 77
- 71. 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
- 72. Two numbers are in the ratio3 : 4. If their LCM is 240, the smaller of the two number is :
 - (a) 100 (b) 80
 - (c) 60 (d) 50
- 73. The product of the LCM and the HCF of two numbers is 24. If the difference of the numbers is 2, then the greater of the number
 - (a) 3 (b) 4
 - (c) 6 (d) 8
- 74. The sum of two numbers is 216 and their HCF is 27. How many pairs of such numbers are there ?
 - (a) 1 (b) 2
 - (c) 3 (d) 0
- 75. 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
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- (c) 134 (d) 38
- 76 The product of two numbers is 20736 and their HCF is 54. Find their LCM.

(a) 685 (b) 468

- (c) 648 (d) 384
- 77. 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
- 78. When a number is divided by 15, 20 or 35, each time the remainder is 8. Then the smallest number is
 - (a) 428 (b) 427
 - (c) 328 (d) 338
- 79. Two numbers are in the ratio3:4. The product of their HCFand LCM is 2028. The sum ofthe numbers is

(a) 68	(b) 72
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- (c) 86 (d) 91
- 80. 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
- 81. 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
- 82. The product of two numbers is 396 ×576 and their LCM is 6336. Find their HCF
 - (a) 36 (b) 34
 - (c) 63 (d) 43
- 83. 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
- 84. 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

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

(a) 72 (b) 60 (c) 48 (d) 36

- 86. The HCF and LCM of two numbers are 18 and 378 respectively. If one of the number is 54, then the other number is:
 - (a) 126 (b) 144
 - (c) 198 (d) 238
- 87. 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
- 88. The smallest perfect square divisible by each of 6, 12 and 18 is:
 - (a) 196 (b) 144
 - (c) 108 (d) 36
- 89. Two numbers are in the ratio 3:4. Their LCM is 84. The greater number is:
 - (a) 21 (b) 24
 - (c) 28 (d) 84
- 90. 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
- 91. 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) $\frac{2}{25}$

92. 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
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(c) 900 (d) 800

- 93. 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

- 94. 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
- 95. 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
- 96. 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
 - (b) 25 (a) 5
 - (c) 100 (d) 125
- 97. The product of two numbers is 2028 and their HCF is 13. The number of such pair is
 - (a) 1 (b) 2
 - (c) 3 (d) 4
- 98. The LCM of three different numbers is 120. Which of the following cannot be their HCF?
 - (a) 8 (b) 12
 - (c) 24 (d) 35
- 99. 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
- 100. 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
 - (b) 10 : 18 : 36 AM

- (c) 10 : 17 : 02 AM (d) 10 : 22 : 12 AM
- 101. 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) $\frac{1}{168}$

- 102. 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
 - (b) 3600 seconds
 - (c) 2400 seconds
 - (d) 4800 seconds
- 103.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. (d) 1.30 p.m.
- 104.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(b) 9 and 380
 - (c) 45 and 76 (d) 46 and 75
- 105. The greatest 4-digit number exactly divisible by 10, 15, 20 is (a) 9990 (b) 9960 (c) 9980 (d) 9995
- 106. The greatest number that divides 411, 684, 821 and leaves 3, 4 and 5 as remainders, respectively, is (b) 146
 - (a) 254
 - (d) 204 (c) 136

- 107. The ratio of two numbers is 3:4 and their HCF is 5. Their LCM is:
 - (a) 10 (b) 60
 - (c) 15 (d) 12
- 108. If A and B are the HCF and LCM respectively of two algebratic expressions x and y, and A + B = x + y, then the value of $A^3 + B^3$ is (1) 3

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

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

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

(a) 147	(b) 528
· · ·	/	· · ·	

- (c) 132 (d) 264
- 110. Three men step off together from the same spot. Their steps measure 63 cm, 70 cm and 77 cm repectively. The minimum distance each should cover so that all can cover the distance in complete steps is
 - (a) 9630 cm (b) 9360 cm
 - (c) 6930 cm (d) 6950 cm
- 111. Find the greatest number which will exactly divide 200 and 320.
 - (a) 10 (b) 20
 - (c) 16 (d) 40
- 112.84 Maths books, 90 Physics books and 120 Chemistry books have to be stacked topicwise. How many books will be their in each stack so that each stack will have the same height too?
 - (a) 12 (b) 18
 - (c) 6 (d) 21
- 113. The greatest number that will divide 729 and 901 leaving 9 remainders and 5 respectively is (.) 1 -(1) 10

- (i	a) I	5		(b)	10	0

- (d) 20 (c) 19
- 114. Three numbers are in the ratio 1:2:3 and their HCF is 12. The numbers are
 - (a) 12, 24, 36 (b) 5, 10, 15

LCM and HCF

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

> (b) $\frac{xz}{u}$ (a) *yz*

- (c) $\frac{xy}{z}$ (d) xyz
- 116. 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 (d) 34 (c) 14
- 117. 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) 3.2^3 (c) $2^2 \cdot 3^7$ (d) 2⁵.3¹⁰.5.7
- 118. A fraction becomes $\frac{1}{6}$ 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 $\frac{1}{3}$. Then. the LCM of the numerator and denominator of the said fraction, must be

119. HCF of
$$\frac{2}{3}$$
, $\frac{4}{5}$ and $\frac{6}{7}$ is

(a)
$$\frac{48}{105}$$
 (b) $\frac{2}{105}$

- (d) $\frac{24}{105}$ (c) $\frac{1}{105}$ 120. What is the greatest number
- which will divide 110 and 128 leaving a remainder 2 in each case? (b) 18 (a) 8
 - (d) 38 (c) 28
- 121.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

Solution

 $25 \times y = 225 \times 5$

- 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
 - 123. 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
 - 124. Product of two co-prime numbers is 117. Then their LCM is
 - (b) 9 (a) 117
 - (d) 39 (c) 13
 - 125. 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

(c) LCM × HCF = Ist number × \land 1. IInd number

or Product of numbers = $HCF \times$ LCM

LCM = 864Þ HCF = 144

one number x = 288

- Let other no. be y\
- $x y = LCM \times HCF$ \
- $288 \times y = 864 \times 144$

$$y = \frac{864 \times 144}{288} = 432$$

- Other no. will be 432
- (c) LCM = 2252.
 - HCF = 5one number = 25
- \ Let other number be y

 $y = \frac{225 \times 5}{25} = 45$ Another no. is 45 3. (c) LCM = 30HCF = 5(given) One number = 10Let another number = y $10 \ y = 30 \times 5$ *y* = **15** HCF = 134. (b) LCM = 455Let numbers be 13x & 13yLCM = 13 x y $LCM = HCF \times Product of other$ 0 factor 13 x y = 455

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 $x y = \frac{455}{13} = 35$

P x y = 35

Possible co-prime Factors of x, $y \ge (35,1), (5,7)$

- Numbers may be
 - $P = 35 \times 13, \quad 1 \times 13 = (455, 13)$ or
 - $P = 5 \times 13, 7 \times 13 = (65, 91)$
- But it is given that one number Ь lies between (75 &125) so.
- Numbers are (65, 91) and number between 75 & 125 is 91. (65, 91)
- 5. (c) LCM of (4, 6, 8, 12, 16)
- $16 \times 3 = 48$ ь
- The number when divided by (4, *.*.. 6, 8, 12, 16) leaves remainder

least number of cans required is:

122. The LCM of two positive

integers is twice the larger

- (a) 3 (b) 6
- (c) 9 (d) 12

2 is = 48 + 2 = 50

- 6. (d) LCM of (12, 15, 20, 54)
- $4 \times 3 \times 5 \times 9 = 540$ Ь
- 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

- Maximum no. of students are = \ 91
- (a) LCM of 4, 6, 8, 14 = 1688. seconds



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

- $\frac{168}{60} = 2\frac{48}{60} = 2$ minute 48 seconds =
- Ist they start ringing at 12.00 O' clock ١
- Again they ring all together Þ after 2 minutes 48 seconds at 12 hrs.

2 min. 48 seconds

- 9. (d) LCM \times HCF = 24
- Product of numbers = 24Let no. be = x, y

xy = 24

and x - y = 2 (given) Factors of x y = 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

Let numbers are

$$= 5x \& 5y$$
$$LCM = 5 x y$$

5 x y = 495

x y = 99

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1, 99 9, 11

ь

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Ь

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(given)

Possible numbers are

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

Now given that sum of numbers = 100So, required numbers are = (45, 55) \lor Difference of numbers = 55 - 45 = **10** 11. (b) HCF = 29Let numbers are 29x, 29yLCM = 29xyLCM = 4147 (given) 29xy = 4147 $xy = \frac{4147}{29} = 143$ Possible co-prime factors $= \begin{pmatrix} 1, 143 \\ 11, 13 \end{pmatrix}$ Possible numbers are = (29, 4147), (319, 377)But both numbers are greater than 29 (given) Numbers are (319, 377) Sum of numbers = 319 + 377 = **696** 12. (d) HCF = 8Now, LCM should have a factor 8. 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 = 42HCF (28, 42) Difference = 42 - 28 = 14For 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 $14 \times 2 \times 3 = 84$ LCM : HCF

> 84 : 14 1 6 :

Possible co-prime factors are 14. (c) LCM = 1820 HCF = 26

Ist number = 130

 $LCM \times HCF = Product of$ ь numbers Let the other number is xь $130 \times x = 1820 \times 26$ $x = \frac{1820 \times 26}{130} = 364$ 15. (b) LCM = 1920 HCF = 16Ist number = 128Let IInd number = x $x \times 128 = 1920 \times 16$ $x = \frac{1920 \times 16}{128} = 240$ *x* = **240** 16. (a) HCF = 478Numbers are = 12906 and 14818 $LCM \times HCF = 12906 \times 14818$ $LCM \times 478 = 12906 \times 14818$ LCM = 40008617. (c) LCM (3, 5, 8, 12) $\rightarrow 3 \times 5 \times 8 = 120$ Now greatest five digit number Þ is 99999 on dividing 99999 by = 120 (LCM) we get remainder -99999 $\frac{1}{120}$, remainder = 39 By subtracting remainder from Þ 99999 we get the greatest five digit number which is completely divisible by given numbers 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. Add 2 in the 99960 Ь 99960 + 2 = **99962** = 18. (c) LCM (4, 5, 6, 7, 8) $= 4 \times 5 \times 6 \times 7 = 840$ Required number Ь 840k + 2, which is divisible by 13. = For $\frac{840k+2}{13}$, (remainder = 0) Remainder = $\frac{8k+2}{13}$

LCM and HCF

Put k = 3Then, remainder = 0For least multiple value of k is minimum At k = 3 we get 840 k + 2 Ь $= 840 \times 3 + 2$ = 2520 + 2 = **2522** 19. (b) LCM (15, 18, 21, 24) $5 \times 3 \times 6 \times 7 \times 4 = 2520$ ь In such type of questions, we Þ take the difference between given number and remainder of that number. Number Remainder Þ (15 - 11) = 4(18 - 14) = 4It will be (21 - 17) = 4same always (24 - 20) = 4Now: Largest 4 digit number is 9999 On dividing 9999 by LCM (2520) we get remainder Þ 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. Our required number \ = 7560 - 4(difference) = 7556 20. (d) LCM (30, 60, 90, 105) $15 \times 2 \times 2 \times 3 \times 7 = 1260$ minutes $\frac{1260}{60}$ = 21 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 $=\frac{360}{60}=6$ minutes Bells will ring simultaneously Þ after every 6 minutes. 22. (c) 989 - 5 = 984 1327 - 7 = 1320(Subtract the remainder from the

number. HCF = (984, 1320) = 24For greatest number take HCF of the numbers 23. (c) 75 litres, 45 litres For maximum capacity take HCF (75, 45) = 1524. (a) Let numbers be = x, yx: y = 3 : 4 (given) HCF = 4Numbers are = $x = 4 \times 3 = 12$ $y = 4 \times 4 = 16$ LCM (12, 16) = 4 × 3 × 4 = **48** 25. (a) 18 - 7 = 1121 - 10 = 1124 - 13 = 11Take LCM (18, 21, 24) Þ 9 × 2 $\times 7 \times 4 = 504$ Required number = (504k - 11)which is divided by 23. For $\frac{504k - 11}{23}$, Remainder should be zero Put minimum value of k so that it completly divides 23. At k = 6, 504k - 11 = 3013completly divisible by 23. Required number is = 3013. 26. (b) HCF = 16 LCM = 160Ist number = 32Let IInd number = xProduct of number = LCM \times HCF $32 \times x = 16 \times 160$ $x = \frac{16 \times 160}{32} = 80$ 27. (b) HCF = 37Let the no. are = 37x & 37ygiven, $37x \times 37y = 4107$ = xy = 3Possible factors of x y = (1, 3)Numbers are $(37, 37 \times 3) = (37, 111)$ greater number is = 111 28. (c) LCM of (21, 36, 66) = 21 × 12 × 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 $7 \times 7 \times 3 \times 3 \times 2 \times 2 \times 11 \times 11$ *.*.. required result is **P** 213444 (which is perfect square) 29. (a) 4 - 1 = 35 - 2 = 36 - 3 = 3LCM $(4, 5, 6) = 4 \times 5 \times 3 = 60$ Required number is 60 - 3 = 5730. (b) LCM (4, 6, 10, 15) $LCM = 2 \times 2 \times 3 \times 5 = 60$ Least number of six digit Þ = 100000 Divide 100000 by 60 we get Þ remainder 40 Least six digit number which Þ is divisible by (4, 6, 10, 15) given number is = (100000 + (60 - 40)) = 100020N = 100020 + 2 = 100022\ 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) $= 5 \times 2 \times 8 \times 3 = 240$ 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 kmSpeed of A = $2\frac{1}{2}$ km/hr

Time taken by A= $\frac{5}{5} \times 2 = 2$

hours

Speed of B = 3 km/hrÞ Time taken by B = $\frac{5}{2}$ hours Speed of C = 2 km/hourÞ Time taken by C = $\frac{5}{2}$ hours \ $\frac{\text{LCM of numerator}}{\text{HCF of denomintor}} = \frac{5}{2}, \frac{5}{3}, \frac{5}{2}$ $=\frac{10}{5}, \frac{5}{3}, \frac{5}{2}$ LCM = $\frac{10}{1}$ = **10** They will meet again after 10 hours 34. (d) Required no. of tiles are area of floor area of tiles Sides of tiles is HCF (1517, 902) =41 Area of tiles = 41×41 \ No. of tiles $= \frac{1517 \times 902}{41 \times 41} = 814$ 35. (c) Let numbers are A & B respectively А : B 2x: 3x(given) $LCM = 2 \times 3 \times x =$ 6xAccording to the question, 6x = 54x = 9 $A = 2x = 2 \times 9 = 18$ \ $B = 3x = 3 \times 9 = 27$ Sum of numbers \ = A + B = 18 + 27 = 45 $(3x + 2x) = 5x = 5 \times 9 = 45$ 36. (c) Let numbers are A & B respectively А : B 4x: 5x(given) $LCM = 4 \times 5 \times x = 20x$ \ 20x = 120x = 6

 $A = 4x = 4 \times 6 = 24$ $B = 5x = 5 \times 6 = 30$ 37. (c) Let numbers are a, b, c. a, b, c are co-prime numbers HCF of co- prime numbers = 1HCF (a, b, c) = 1 $a \times b = 551$, $b \times c = 1073$ $\frac{a \times b}{b \times c} = \frac{1073}{551} = \frac{37 \times 29}{19 \times 29}$ $\frac{a}{c} = \frac{37}{10}$ Þ Common 'b' factor is cancel out. Ь a = 37, b = 29 c = 19 Sum of numbers a + b + c = 37 + 29 + 19 = 85 38. (c) HCF of numbers = 7Let the numbers are 7x and 7yLCM = 7xy7xy = 140(given) xv = 20Possible co-prime factors of xyÞ = (1,20), (4,5) Numbers are between 20 and 45 ь Required numbers are $= 4 \times 7 = 28$ and $5 \times 7 = 35$ Sum of numbers are = 28 + 35 = 6339. (b) HCF = 15LCM = 3001st number = 60 Let 2nd number = xHCF × LCM = 1st Number × 2nd number $15 \times 300 = 60 \times x$ x = 75Other number = **75** \ 40. (d) HCF = 23Let numbers are = 23x, 23yLCM = 23xy\ Now given that factor of LCM are Þ 13, 14 $LCM = 23 \times 13 \times 14$ \ Numbers are = 23×13 = 299 and 23 × 14 = 322 larger = 32241. (b) LCM (6, 8, 10) = $3 \times 2 \times 4 \times 5 = 120$

42. (b) LCM (4, 6, 8, 9) = $2 \times 2 \times 3 \times 2 \times 3$ = 72

Required result should be = 7243. (b) LCM (3, 4, 5, 6, 7, 8) $3 \times 4 \times 5 \times 7 \times 2 = 840$ Divide 10000 by LCM Ь 10000 $\frac{10000}{840}$, we get remainder = 760 Now two possiblities are 10000 - 760 = 9240or 10000 + (840 - 760) = 10080 So, nearest number is = 10080. 44. (a) 1305, 4665, 6905 are three numbers greatest number which leaves same remainder in each case. To find this take difference of numbers (1305, 4665, 6905 1305 6905 Ь 4665 - 2240 . 1120 1120 is the no. which leaves the same remainder when divide 1305, 4665, 6905 Sum of number digit 1 + 1 + 2 + 0 = 4Þ 45. (c) HCF = 4Let numbers are 4x and 4yGiven sum = 4x + 4y = 36 and x + y = 9possible pairs \blacktriangleright (1+8), (2+7), (4+5), numbers should be co prime. Hence only 3 pairs 46. (d) 122 - 2 = 120 / subtract difference $243 - 3 = 240 \sqrt{\text{from number}}$ HCF = (120, 240) = 120Answer = 12047. (d) HCF = 16Let numbers are 16x and 16y 16xy = 480xy = 30Possible pairs / = (1,30), (2, 15), (6, 5)

= (16, 480), (32, 240), (80, 96)

possible numbers are

- 80, 96 is the answer in the given options of 2 digit.
- 48. (b) 12 5 = 7

LCM and HCF

$$16 - 9 = 7$$
Remainder always remains same
in such question,
 $\ LCM (12, 16) = 48$
Required result = $48 - 7 = 41$
49. (c) $10 - 9 = 1$
 $9 - 8 = 1$
 $8 - 7 = 1$
 $\ LCM (10, 9, 8) = 5 \times 2 \times 9 \times 4 = 360$
 $\ Required result = 360 - 1 = 359$
50. (d)LCM (5, 6, 8) = $5 \times 6 \times 4 = 120$
 $\$ Required number gives remainder
 3 when divided by (5, 6, 8) and zero
remainder when divided by 9
 $\ \frac{120K+3}{9} = \frac{3K+3}{9}$
at $k = 2, \frac{3K+3}{9}$
 $\$ Remainder = 0
We get120K + 3 = $120 \times 2 + 3 = 243$ which is the required
number.
51. (b) LCM (3, 5, 6, 8, 10, 12)
 $\ = 3 \times 5 \times 2 \times 4 = 120$
Required number is
 $\ = \frac{120K+2}{22} = \frac{10K+2}{22}$
 $\$ at $k = 2, \frac{10K+2}{22}$
 $\$ Remainder = 0
The given condition satisties
 $\ = 120K + 2 = 240 + 2 = 242$
52. (a) $307 - 3 = 304$
 $\ 330 - 7 = 323$
 $\$ HCF ($304, 323$)
 $\ 304 \qquad 323$
 $\ -19 \qquad 19 \qquad 10$
 $\$ HCF = 19
The greatest no. is = 19.
53. (d) Let HCF = x
 $\$ LCM = $84x$
 $\$ Given HCF + LCM = $84x + x = 680$

3015 5040 Þ -2025 Take difference of this difference. HCF = 45 27×3 HCF = 12758. (a) Product of two numbers = 1280 HCF = 8 $LCM = \frac{1280}{8} = 160$ 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' $\frac{90k+4}{7} = \frac{6K+4}{7}$ At K = 4, $\frac{6K+4}{7}$ \triangleright remainder = 0 So, number is $90K + 4 = 90 \times 4 + 4$ 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 digit number is = 99999 Divide 99999 by LCM (720)

99999 $\frac{750}{720}$, we get remainder = 639

So, The largest 5 digit number which divides completely the given number is

= 99999 - 639 = **99360**

Required no. is 99360 + 10 = 99370

61. (b) LCM (16, 20, 24)
=
$$8 \times 2 \times 5 \times 3$$

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= 2×2×2×2×5×3×5×

Multiply by 5×3 to make pair

- 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
- Remainder when 43582 Þ divided by 150

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

Þ Two possiblities are = 43582 - 82 = 43500 or

43582 + (150 - 82) = 43650

Nearest = 43650

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

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HCF = 48
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85x = 680x = 8

Required number = 9999 - 279 = 9720

Remainder is = 279

9999 = 540

56. (d) 3026 - 11 = 3015 5053 - 13 = 5040

 $56 \times y = 672 \times 8$

Sum of HCF + LCM = 2520

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

=x + 20x = 2520

 $LCM = 120 \times 20 = 2400$

Let another number = y

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

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

largest 4 digit number = 9999

on dividing by 540 to number

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

 $v \times 480 = 120 \times 2400$

one number = 480

21x = 2520

x = 120

HCF = 120

54. (d) Let HCF = x

LCM = 20x

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between Ь numbers. The HCF may be difference itself or may a factor

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

 $2037 - 5 = 2032$
 $2032 - 1651 \ge 381 = 1$

Stacks of english = $\frac{336}{48}$ = 7 \ Stacks of maths = $\frac{240}{48}$ = 5 Stacks of science = $\frac{96}{48}$ = 2 Total no. of stacks = 7 + 5 + 2 = 14\ 64. (a) Let numbers are = 2x, 3x, 4xGiven, LCM $(2 \times 3 \times 2)x = 12x$ 12x = 240(given) x = 20Numbers are = $2 \times 20 = 40$ \ $3 \times 20 = 60$ $4 \times 20 = 80$ Smaller is 40 \ 65. (c) A + B = 45 $A - B = \frac{45}{9} = 5$ A = 25, B = 20\ LCM (25, 20) = $5 \times 5 \times 4 = 100$ 66. (c) HCF = 17 Let numbers are \ = 17x, 17yLCM = 17xy = 714 (given) xy = 42Possible 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) Numbers are = (102, 119)\ sum of numbers \ = 102 + 119= 221 67. (c) HCF = 15 Product of two numbers = 6300 \ Let numbers are 15x, 15y $15x \times 15y = 6300$ (given) $xy = \frac{6300}{15 \times 15} = 28$ Possible pairs are = (1, 28), (7, 4)

 \land Total pairs = 2

68. (b) 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 $\frac{60K+2}{4K+2}$ At k = 3, $\frac{4K+2}{7}$ \triangleright Remainder = 0 No. = $60K + 2 = 60 \times 3 + 2 = 182$ 69. (c) LCM (9, 10, 15) $= 3 \times 3 \times 10 = 90$ $\frac{1936}{90}$, remainder \blacktriangleright 46 number Least when is \ subtracted from 1936 which gives remainder 7 when divided by (9, 10,15) is = (46 - 7) = 3970. (a) 18 - 5 = 1327 - 14 = 1336 - 23 = 13LCM (18, 27, 36) = $9 \times 2 \times 3 \times 2 = 108$ Required number = 108 - 13 = 95 71. (c) LCM (24, 32, 36, 64) $8 \times 3 \times 4 \times 3 \times 2 = 576$ Required no is = 576 - 5 = 57172. (c) Let the number are x and yrespectively x: y3: 4 (given) ▶ Let 3 m : 4m \blacktriangleright LCM = 3 × 4 × m = 240 (given) $p m = \frac{240}{12} = 20$ Numbers are = $A = 3 \times 20 = 60$ $B = 4 \times 20 = 80$ Least number is 60 \ 73. (c) Let numbers are m and n $LCM \times HCF = 24$ (given) $LCM \times HCF = m \times n$ $24 = m \times n$, But m-n = 2 \ given So, such value is (6, 4) and greater no. = 6

Let numbers are 27x and 27yrespectively 27x + 27y = 216 given $P(x + y) = \frac{216}{27} = 8$ only possible factors are = (1, 7), (3, 5)75. (a) Let HCF = xLCM = 12x(given) \vee HCF + LCM = 13x = 403 x = 31 \vee HCF = 31 $LCM = 12 \times 31$ one number = 93 given Let other number is y $93 \times v = 31 \times 31 \times 12$ $y = 4 \times 31 = 124$ 76. (d) Let No. are a and b a × b = 20736 HCF = 54We know that $(a \times b) = (HCF \times LCM)$ $20736 = 54 \times LCM$ $LCM = \frac{20736}{5}$ = 384 77. (a) 12 - 2 = 1016 - 6 = 1024 - 14 = 10LCM (12, 16, 24) = $6 \times 2 \times 4 \times 1 = 48$ Greatest number of four digits = 9999 When it is divided by 48 we get = 15The greatest number of 4 digits which completely divides the given number is = 9999-15 = 9984 Number is = 9984 - 10 = 9974 78. (a) LCM (15, 20, 35) $= 5 \times 3 \times 4 \times 7 = 420$ Required number = 420 + 8 = 42879. (d) Let the numbers are = 3x, 4x respectively \vee HCF = x $LCM = 3 \times 4 \times x = 12x$ Given that = HCF × LCM = $x \times 12x = 2028$ $12x^2 = 2028$ $x^2 = 169$

x = 13

74. (b) HCF = 27

LCM and HCF

\ Sum of numbers = 3x + 4x = 7x $= 7x = 7 \times 13 = 91$ 80. (c) HCF = 48\ Let number are 48x & 48 y respectively 48x + 48y = 384Þ $(x+y) = \frac{384}{48} = 8$ So, possible pairs of coprime no. are (1, 7), (3, 5)Numbers are (48, 336) or (144, \ 240) Difference between numbers is = 336 - 48= 288 and 240 - 144 = 96 81. (c) Let numbers be 12x and 12yrespectively LCM = 12 xv12xy = 1056 (given) xy = 88Possible pairs are (1, 88) (8, 11)\ possible numbers are (12, 1056) (96, 132)= Given that one number is132 so other is 96 82. (a) We, know that \mathbf{P} (a× b)= (HCF and LCM) 396 ×576 = HCF × 6336 HCF = 3683. (d) HCF = 8LCM = 48One number = 24 Let other number be = y $24y = 48 \times 8$ y = 16 84. (b) HCF = 12LCM = 336One number = 84 Let another number be = y $84y = 12 \times 336$ \ y = 4885. (d) Product of number = 216HCF = 6 $LCM = \frac{216}{6} = 36$ 86. (a) HCF = 18LCM = 378 One number = 54

Let another number be = y $54v = 18 \times 378$ $y = \frac{18 \times 378}{54} = 126$ 87. (b) LCM (20, 28, 32, 35) $4 \times 5 \times 7 \times 8 = 1120$ LCM = (20, 28, 32, 35) = 11201120 divided by 20, 28, 32, 35 completely Let x be subtracted from 5834, 5834 - x = 1120x = 5834 - 1120 = 471488. (d) LCM (6, 12, 18) $LCM = 6 \times 2 \times 3 = 36$ To find perfect square split the LCM into factors and make pair of factors so that it becomes the square. $LCM = 2 \times 3 \times 2 \times 3 = 36$ ь $2 \times 2 \times 3 \times 3$ = 36 Which is already a perfect ь square 89. (c) Let numbers are = 3x & 4xrespectively LCM = 84(GIVEN) LCM of number = common factor (other factors) $= x \times 3 \times 4 = 12x$ 12x = 84x = 7Numbers are = $3x = 7 \times 3 = 21$ $4x = 7 \times 4 = 28$ Greater number is 28 90. (b) HCF = 12 Let numbers are 12x & 12y respectively Given that (12x + 12y) = 84 $\mathbf{p} = \frac{84}{12} = 7$ x + y = 7possible factor are (1 + 6), (2 + 5), 95. (d) HCF = 96 (3 + 4)Total factors are 3 \ 91. (c) HCF = 3 Let numbers are 3x & 3y. respectively

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LCM \triangleright 3xy = 105 (given) $xy = \frac{105}{3} = 35$ also given = (3x + 3y) = 36ь x + y = 12\ We required sum of reciprocals of numbers $\mathbf{p} \quad \frac{1}{3x} + \frac{1}{3y} = \frac{x+y}{3xy}$ $p = \frac{12}{3 \times 35} = \frac{4}{35}$ 92. (a) Let HCF = xLCM = 44xGiven HCF + LCM = 44x + x = 45x45x = 1125 $x = \frac{1125}{45} = 25$ HCF = 25, \backslash $LCM = 25 \times 44$ Also given that one number = 25Let another number = y $25y = 25 \times 25 \times 44$ $y = \frac{25 \times 25 \times 44}{25}$ = 110093. (c) HCF = 12 Let numbers are 12x & 12y respectively LCM $\ge 12xy = 924$ $(given) \ge xy = 77$ ▶ possible pairs are $= (1 \times 77) (7 \times 11)$ Only two pairs are possible 94. (a) LCM = 520HCF = 4one number = 52Let other number is = y $52v = 4 \times 520$ v = 40LCM = 1296one number = 864Let other number is = x864× x= 96×1296 x = 144

96. (b) Let HCF = x \downarrow LCM = 4x \downarrow Given HCF + LCM = 125 x + 4x = 125 5x = 125 x = 25 \downarrow HCF = 25 LCM = 4 × 25 Given one number = 100

• Let other number is = y • $100y = 25 \times 100$

v = 25

- 97. (b) HCF = 13 (given) Let number are 13x & 13 y respe-ctively
- Also given $13x \times 13y = 2028$ $13 \times 13 \times xy = 2028$

$$xy = \frac{2028}{13 \times 13} = 12$$

- 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 different factors of the given numbers.
- \land 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

HCF = 4

So, for the given numbers the HCF should be multiple of 4

- Hence go through options which is not a multiple of 4 is 35
 Hence answer is **35**.
- 99. (d) LCM (16, 18, 20, 25)
- 3600 will be completely divisible by the given number so, 4 remainder obtained by adding '4' in the LCM
- But it should not leave any remainder when divided by 7
 So, given number should be

 $\frac{(3600k+4)}{7} = \frac{2K+4}{7}$ $\frac{2K+4}{7}$ at k = 5, remainder = 0 At given condition satisfy. No. = $3600K + 4 = 3600 \times 5 + 4$ Ь = 18000 + 4 = 18004100. (b) LCM (24, 36, 54) $12 \times 2 \times 3 \times 3 = 216$ seconds Ь They will change simultaneously after every 216 seconds $\frac{216}{60}$ = $3\frac{36}{60}$ = 3 minute 36 second They change 1st at 10:15:00 am So, again they change at = 10:18:36 am 101. (b) For HCF of fractions take HCF of numerators and LCM of denominators HCF of 3, 5, 6 = 1LCM of 4.6.7 = 84Hence, HCF of fractions = $\frac{1}{84}$ 102. (a) LCM (200, 300, 360, 450) $10 \times 4 \times 5 \times 3 \times 3 = 1800$ seconds ь They meet at the starting point after every 1800 seconds 103. (b) LCM (20, 30, 40) $4 \times 5 \times 3 \times 2 = 120$ minutes $\frac{120}{60}$ = 2 hours They 1st bell at 11 am. So, the again bell after 2 hours at 11 + 2 = 1 pm. 104. (c) Cows = 945Sheep = 2475▶ For largest flocks take HCF 945 2475 ь For HCF take difference of number HCF will either be the difference or its factor $= 17 \times 3 \times 3 \times 5 \times 2$ 1530 Þ $= 17 \times 2 \times 45$ HCF = 45Maximum animals in each

flock = 45

- No. of flocks of cows are
 - $=\frac{945}{45}=21$
 - ▶ No. of flocks of sheep are

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

Total number of flocks = 21 + 55 = **76** (45, 76)

105. (b) LCM (10, 15, 20)

- Largest 4 digit number = 9999 divide 9999 by LCM of given number
- ▶ We get remainder = 39
- So, to divide completely subtract it from (9999 - 39) = 9960
- 9960 is the largest four digit number which is completely divided by the given numbers (9960)
- 106. (c) 411 3 = 408684 - 4 = 680821 - 5 = 816
 - Take HCF of given number to get required greatest number

- HCF = 136 Take difference of the numbers.
- 107. (b) HCF = 5

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Ratio of numbers is (3 : 4) Given

- So, numbers are = 15 & 20
- $\ \ LCM = 5 \times 3 \times 4 = 60$

(given)

LCM = B Given numbers are x & y respectively. (Product of numbers is P Product of LCM × HCF)

p xy = AB

Now \blacktriangleright A + B = x + y (given) Take cube on both sides \blacktriangleright (A + B)³ = (x + y)³

 $P A^3 + B^3 + 3AB (A + B)$ $= x^{3} + y^{3} + 3xy(x + y)$ $P A^3 + B^3 + 3xy (x + y)$ $= x^{3} + y^{3} + 3xy(x + y)$ $A^3 + B^3 = \chi^3 + \chi^3$ \ (Put AB = xy from above) 109. (c) HCF = 44LCM = 264Let numbers are = x & y \therefore Given = $\frac{x}{2}$ = 44 x = 88 $y = \frac{\text{HCF} \times \text{LCM}}{x} \neq \frac{44 \times 264}{88} \neq 132$ 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 320 200 $120 = 40 \times 3$ (for HCF take difference or take factor of difference) HCF = 40(for greatest number divided by take LCM) 112. (c) HCF = (84, 90, 120)Þ 84 90 120 24 $\Rightarrow 6 \times 4$ HCF = 6Maximum no. of books in each \ stack = 6. 113. (b) 729 - 9 = 720 901 - 5 = 896HCF (720, 896) 896 720 176 \Rightarrow 11 × 16 ▶ HCF = 16

114. (a) HCF = 12Given ratio of numbers = A : B : C1:2:3Numbers are = A = 12 $B = 12 \times 2 = 24$ $C = 12 \times 3 = 36$ (12, 24, 36)115. (d) HCF = zGiven ratio of the numbers = x : y $LCM = z \times x \times y = xyz$ LCM is the product of HCF and other factors 116. (b) Let two consecutive positive even numbers are (2x + 2) and (2x + 4)HCF = 2 (given) common (factor) \land LCM = 2(x + 1) (x + 2) ß HCF (other factors) \downarrow LCM = 84 (given) 2(x + 1)(x + 2) = 84(x+1)(x+2) = 42 $x^2 + 3x + 2 = 42$ $x^{2} + 3x + 2 - 42 = 0$ $x^2 + 8x - 5x - 40 = 0$ P = x(x+8) - 5(x+8) = 0(x - 5) (x + 8) = 0x = +5x = -8But numbers are even, so (x = 5)Number are = $2 \times 5 + 2 = 12$ and $2 \times 5 + 4 = 14$ Sum of numbers are = 12 + 14 = 26Ь 117. (b) $P = 2^3 \cdot 3^{10} \cdot 5$ $Q = 2^5 3.7$ HCF (P, Q) = (common factor of P & Q) $= 2^3.3$ 118. (a) Let fraction is $\frac{x}{y}$ $\frac{x-4}{u+1} = \frac{1}{6}$ (given) P Cross multiply the equation b = 6x - 24 = y + 1

> 6x - y - 25 = 0....(i)

Again, $\frac{x+2}{u+1} = \frac{1}{3}$ (given) Ь 3x + 6 = u + 13x - y + 5 = 0.....(ii) From equaltion (i) and (ii) 6x - y = 253x - y = -5х = 10 y = 35 $\frac{x}{u} = \frac{10}{35} = \frac{2}{7}$ Fraction = $\frac{x}{u} = \frac{2}{7}$ Numerator = 2Denominator = 7LCM (numerator, denominator) $P_{2} \times 7 = 14$ 119. (b) HCF of fractional numbers is æ HCF of numerator ö $\frac{1}{6}$ LCM of denominator $\frac{1}{9}$ \therefore HCF $\overset{\text{ac}2}{\underbrace{\&}3}, \frac{4}{5}, \frac{6}{7}$ $\xi_{\text{LCM 3, 5, 7} \phi}^{\text{acHCF 2, 4, 6} \ddot{0}} = \frac{2}{3 \times 5 \times 7} = \frac{2}{105}$ 120. (b) 110 - 2 = 108128 - 2 = 126\ HCF (108, 126) = 18 121. (b) for least or minimum number of canes we should have maximum capacity canes for required quantity For this we take HCF of given Þ quantities. HCF (21, 42, 63) = 21Maximum capacity of a cane = 21 litres Number of canes of cow milk $=\frac{21}{21}=1$

Number of canes of toned milk

$$=\frac{42}{21}=2$$

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Number of canes of double toned

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

- $\therefore \text{ Total number of canes} = 1 + 2 \\ + 3 = 6$
- 122. (c) G.C.D. = Greatest common divisor or Highest common factor (HCF)
 - Let G.C.D. = a
 - Let number are ax and ay(ax > ay)

LCM = axy

- LCM = $2 \times \text{larger number}$
 - $axy = 2 \times ax$
 - ∖ *y* = 2

Also given that

▶ Smaller number – G.C.D = 4

▶ a*y* – a= 4 2a – a = 4 a = 4 G.C.D = a = 4y = 2Smaller number $= ay + 2 \times 4 = 8$ 123. (d) HCF (GCD) of a, b number is 12 and a > b > 12 (given) Smallest value of a & b are (36, 24) 124. (a) HCF of co prime number is always 1 \ Let numbers are = x & y respectively Product of number = x y

x y = 117(given) \ Product of number = $LCM \times HCF$ ▶ LCM × 1 = 117 LCM = 117125. (b) HCF = 12 Let numbers are 12x & 12y \ Product of two number = 12x. 12y \ = 144xy144xy = 2160p xy = 15Possible pairs are (1, 15), (3,5), factors should be co-prime. Two pairs are possible. So, Factors of 1176 is 42,28 ١ HCF of 2268, 3444 is = 42