Some Properties of HCF, LCM and Remainder:

1) Largest number which divides x, y, z to leave same remainder is HCF (x - y, y - z, z – x).

2) Largest number which divides x, y, z to leave remainder a,b,c is HCF (x-a, y - b, z – c).

3) Least number when divided by x, y, z and leaves a remainder R in

Each case = LCM (x, y, z) + R

4) Least number when divided by x, y, z leaves a remainders a, b, c and

If x-a = y-b = z-c = k, is LCM(x,y,z)-k.

Problems on H.C.F and L.C.M - General Questions:

1) Find the greatest number that will divide 43, 91 and 183 so as to leave the same remainder in each case.
   a) 4
   b) 7
   c) 9
   d) 13
   Answer: a)
   Explanation:

   Required number = H.C.F. of (91 - 43), (183 - 91) and (183 - 43)

   = H.C.F. of 48, 92 and 140 = 4.

2) Find the greatest integer that divides 358, 376, and 334 and leaves the same remainder in each case.
   a) 6
   b) 7
   c) 8
   d) 9
   Ans : a)

3) Find the greatest number that will divide 43, 91 and 183 so as to leave the same remainder in each case.
   Answer : 4

4) The G.C.D. of 1.08, 0.36 and 0.9 is:
   a) 0.03
   b) 0.9
   c) 0.18 (Ans)
   d) 0.108

5) Find the least number which when divided by 6,15,18 leave remainder 5 in each case.
   Ans : L.C.M (6,15,18) + 5 = 95

6) Find the least number which when divided by 12,16,18 leave remainder 5 in each case.
   Ans : L.C.M (12,16,18) + 5 = 149

7) Least number which when divided by 35, 45, 55 and leaves Remainder 18, 28, 38 is?
   Solution: In this case we will evaluate LCM.
   Here the difference between every divisor and remainder is same i.e. 17.
   Therefore, required number = LCM of (35, 45, 55)-17 = 3465-17 = 3448.

8) 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
   Answer: (a)

9) The least multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15 and 18 is:
   A) 74
   B) 94
   C) 184
   D) 364
   ANSWER: D

   L.C.M. of 6, 9, 15 and 18 is 90.
   Let required number be 90*k* + 4, which is multiple of 7.
   Least value of *k* for which (90*k* + 4) is divisible by 7 is *k* = 4.
   Required number = (90 x 4) + 4 = 364.

10) The product of two numbers is 4107. If the H.C.F. of these numbers is 37, then the greater number is:
   a) 101
   b) 107
   c) 111
   d) 185
   Answer: (c)

   Explanation:

   Let the numbers be 37*a* and 37*b*.

   Then, 37*a* x 37*b* = 4107

   ab = 3.

   Now, co-primes with product 3 are (1, 3).

   So, the required numbers are (37 x 1, 37 x 3) *i.e.,* (37, 111).

   Greater number = 111.

11) The product of two numbers is 2028 and their H.C.F. is 13. The number of such pairs is:

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

Answer: (b)

Explanation:

Let the numbers 13*a* and 13*b*.

Then, 13*a* x 13*b* = 2028

ab = 12.

Now, the co-primes with product 12 are (1, 12) and (3, 4).

So, the required numbers are (13 x 1, 13 x 12) and (13 x 3, 13 x 4).

Clearly, there are 2 such pairs.

12) Two numbers are in the ratio of 15:11. If the HCF of numbers is 13, find the numbers

a) 75, 55

b) 105, 77

c) 15, 11

d) 195, 143

Answer: D

Explanation: Let the two numbers are 15x and 11x.

HCF = x.

x = 13.

Therefore, the numbers are (15 x 13 and 11 x 13), i.e. 195 and 143.

13) Three number are in the ratio of 3: 4: 5 and their L.C.M. is 2400. Their H.C.F. is:

a) 40
b) 180
c) 120
d) 200

Explanation:

Let the numbers be 3*x*, 4*x* and 5*x*.

Then, their L.C.M. = 60*x*. So, 60*x* = 2400 or x = 40. The numbers are (3 x 40), (4 x 40) and (5 x 40). Hence, required H.C.F. = 40.

14) What is the least number, which when divided by 7, 8 and 11 gives 6 , 7 and 10 as the remainders respectively?
Answer: 615

15) The least number which when divided by 5, 6 , 7 and 8 leaves a remainder 3, but when divided by 9 leaves no remainder, is:
a) 1677
b) 1683
c) 2523
d) 3363
Answer: B
Explanation:
L.C.M. of 5, 6, 7, 8 = 840. Required number is of the form 840*k* + *3.*
Least value of *k* for which (840*k* + 3) is divisible by 9 is *k* = 2.
Required number = (840 x 2 + 3) = 1683.

16) The LCM of two numbers is 7700, and their HCF is 11. If one of these numbers is 275, what is the other number?
a) 279
b) 283
c) 308
d) 318
Answer: C

17) If the HCF of two numbers is 27, and their sum is 216, find these numbers.
a) 27,189
b) 154,162
c) 108,108
d) 81,189
Answer: A
Explanation:
Let the numbers be 27x and 27y.
Then, 27x + 27y = 216
27*(x+ y) = 216
x + y = 8
Co-prime numbers with sum 8 are (1, 7) and (3, 5).
So Answer is 27,189 by substituting (1, 7) in 27x & 27y.

18) The ratio of two numbers is 3: 4 and their H.C.F. is 4. Their L.C.M. is:
a) 12
b) 16
c) 24
d) 48
Answer: 48

19) Three numbers are in the ratio of 3 : 4 : 5 and their L.C.M. is 2400. Their H.C.F. is:
a) 40
b) 80
c) 120
d) 200
Answer: 40.

20) In Mahabalipuram temple there are some magical bells which toll 18 times in a day, simultaneously. But every bells tolls at a different interval of time, but not in a fraction of minutes. The maximum number of bells in the temple?
    a) 6 bells
    b) 8 bells
    c) 10 bells
    d) 12 bells
    Answer: 10 Bells

Explanation: Total Minute in a Day = 24 hour X 60 Minutes = 1440 Minutes

$$\text{Interval} = \frac{1440\ minutes}{18\ Tolls} = 80 \text{ minutes}$$

Find factors of 80 i.e. 80 = 1,2,4,5,8,10,16,20,40,80.

Therefore 10 bells as since each bell tolls at a different interval and there are 10 unique factors of 80, the maximum number of bells that can toll in the temple is:
Maximum number of bells=10.

21) If the number 97215A6 is divisible by 11, find the smallest whole number in the place of A.
    A) 3
    B) 4
    C) 6
    D) 8
    Answer: 3

22) 476 ** 0 is divisible by both 3 and 11. The non-zero digits in the hundred's and ten's places are respectively:

    a) 7 & 4
    b) 7 & 5
    c) 8 & 5
    d) N.O.T
    Answer: 8 & 5.

23) A 3-digit number 4A3 is added to another 3-digit number 984 to give a 4-digit number 13B7, which is divisible by 11. Then (A+B) is:
    a) 10
    b) 11
    c) 12
    d) 15

Explanation: Since 13b7 is divisible by 11, we have, (7+3)−(b+1) = 0⇒ 9−b = 0⇒ b = 9. Putting b = 9, a+8 = 9 we get a = 1 Hence, a + b = (1+9) = 10.

24) If the number 42573 * is exactly divisible by 72, then the minimum value of * is:
    a) 6
    b) 5
    c) 7
    d) 9
    Answer: 6

25) 551234574 * 1134 = 62N100006916. Find N?
    a) 5
    b) 6 (Answer: 6 ; Use Divisibility test of 9)
    c) 7
    d) 9