

Book For
Railway Recruitment Board



Problems on H.C.F and L.C.M



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Q. 1 Six bells commence tolling together and toll at intervals of 2, 4, 6, 8 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together ?

- [A] 4
- [B] 10
- [C] 15

[D] 16

Answer Option [D]

Explanation:

L.C.M. of 2, 4, 6, 8, 10, 12 is 120.

So, the bells will toll together after every 120 seconds (2 minutes).

In 30 minutes, they will toll together $\frac{30}{2} + 1 = 16$ times.

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Q. 2 **The H.C.F. of two numbers is 23 and the other two factors of their L.C.M. are 13 and 14. The larger of the two numbers is:**

[A] 276

[B] 299

[C] 322

[D] 345

Answer Option [C]

Explanation:

Clearly, the numbers are (23×13) and (23×14) .

\therefore Larger number = $(23 \times 14) = 322$.

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Q. 3 **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 Option [A]

Explanation:

$N = \text{H.C.F. of } (4665 - 1305), (6905 - 4665) \text{ and } (6905 - 1305)$

$= \text{H.C.F. of } 3360, 2240 \text{ and } 5600 = 1120$.

Sum of digits in $N = (1 + 1 + 2 + 0) = 4$

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Q. 4 **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 Option [D]

Explanation:

Let the numbers be $3x$ and $4x$. Then, their H.C.F. = x . So, $x = 4$.

So, the numbers 12 and 16.

L.C.M. of 12 and 16 = 48.

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Q. 5 **Which of the following has the most number of divisors?**

[A] 99

[B] 101

[C] 176

[D] 182

Answer Option [C]

Explanation:

$$99 = 1 \times 3 \times 3 \times 11$$

$$101 = 1 \times 101$$

$$176 = 1 \times 2 \times 2 \times 2 \times 2 \times 11$$

$$182 = 1 \times 2 \times 7 \times 13$$

So, divisors of 99 are 1, 3, 9, 11, 33, .99

Divisors of 101 are 1 and 101

Divisors of 176 are 1, 2, 4, 8, 11, 16, 22, 44, 88 and 176

Divisors of 182 are 1, 2, 7, 13, 14, 26, 91 and 182.

Hence, 176 has the most number of divisors.

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Q. 6 **If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, then the sum of the reciprocals of the numbers is equal to:**

[A] $\frac{55}{601}$

[B] $\frac{601}{55}$

[C] $\frac{11}{120}$

[D] $\frac{120}{11}$

Answer Option [C]

Explanation:

Let the numbers be a and b .

Then, $a + b = 55$ and $ab = 5 \times 120 = 600$.

$$\therefore \text{The required sum} = \frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{55}{600} = \frac{11}{120}$$

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Q. 7 **Find the highest common factor of 36 and 84.**

[A] 4

[B] 6

[C] 12

[D] 18

Answer Option [C]

Explanation:

$$36 = 2^2 \times 3^2$$

$$84 = 2^2 \times 3 \times 7$$

$$\therefore \text{H.C.F.} = 2^2 \times 3 = 12.$$

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Q. 8 **The L.C.M. of two numbers is 48. The numbers are in the ratio 2 : 3. Then sum of the number is:**

[A] 28

[B] 32

[C] 40

[D] 64

Answer Option [C]

Explanation:

Let the numbers be $2x$ and $3x$.
Then, their L.C.M. = $6x$.
So, $6x = 48$ or $x = 8$.
 \therefore The numbers are 16 and 24.
Hence, required sum = $(16 + 24) = 40$.

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Q. 9 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] 80
- [C] 120
- [D] 200

Answer Option [A]

Explanation:

Let the numbers be $3x$, $4x$ and $5x$.
Then, their L.C.M. = $60x$.
So, $60x = 2400$ or $x = 40$.
 \therefore The numbers are (3×40) , (4×40) and (5×40) .
Hence, required H.C.F. = 40.

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Q. 10 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 Option [B]

Explanation:

L.C.M. of 5, 6, 7, 8 = 840.
 \therefore Required number is of the form $840k + 3$
Least value of k for which $(840k + 3)$ is divisible by 9 is $k = 2$.
 \therefore Required number = $(840 \times 2 + 3) = 1683$.

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Q. 11 The least number which should be added to 2497 so that the sum is exactly divisible by 5, 6, 4 and 3 is:

- [A] 3
- [B] 13
- [C] 23
- [D] 33

Answer Option [C]

Explanation:

L.C.M. of 5, 6, 4 and 3 = 60.
On dividing 2497 by 60, the remainder is 37.
 \therefore Number to be added = $(60 - 37) = 23$.

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Q. 12 252 can be expressed as a product of primes as:

- [A] $2 \times 2 \times 3 \times 3 \times 7$
- [B] $2 \times 2 \times 2 \times 3 \times 7$
- [C] $3 \times 3 \times 3 \times 3 \times 7$
- [D] $2 \times 3 \times 3 \times 3 \times 7$

Answer Option [A]

Explanation: Clearly, $252 = 2 \times 2 \times 3 \times 3 \times 7$.

- Q. 13 Three numbers which are co-prime to each other 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

Answer Option [C]

Explanation:

Since the numbers are co-prime, they contain only 1 as the common factor.

Also, the given two products have the middle number in common.

So, middle number = H.C.F. of 551 and 1073 = 29;

$$\text{First number} = \left(\frac{551}{29}\right) = 19; \quad \text{Third number} = \left(\frac{1073}{29}\right) = 37.$$

∴ Required sum = (19 + 29 + 37) = 85.

- Q. 14 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 Option [A]

Explanation:

Required number = H.C.F. of (91 - 43), (183 - 91) and (183 - 43)
= H.C.F. of 48, 92 and 140 = 4.

- Q. 15 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 Option [C]

Explanation:

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

Then, $37a \times 37b = 4107$

$\Rightarrow ab = 3$.

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

So, the required numbers are $(37 \times 1, 37 \times 3)$ i.e., (37, 111).

∴ Greater number = 111.

- Q. 16 The least number, which when divided by 12, 15, 20 and 54 leaves in each case a remainder of 8 is:
- [A] 504
[B] 536
[C] 544
[D] 548

Answer Option [D]

Explanation:

Required number = (L.C.M. of 12, 15, 20, 54) + 8
= 540 + 8
= 548.

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Q. 17 The greatest number which on dividing 1657 and 2037 leaves remainders 6 and 5 respectively, is:

- [A] 123
- [B] 127
- [C] 235
- [D] 305

Answer Option [B]

Explanation:

Required number = H.C.F. of (1657 - 6) and (2037 - 5)
= H.C.F. of 1651 and 2032 = 127.

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Q. 18 The smallest number which when diminished by 7, is divisible 12, 16, 18, 21 and 28 is:

- [A] 1008
- [B] 1015
- [C] 1022
- [D] 1032

Answer Option [B]

Explanation:

Required number = (L.C.M. of 12, 16, 18, 21, 28) + 7

$$= 1008 + 7$$
$$= 1015$$

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Q. 19 The H.C.F. of two numbers is 11 and their L.C.M. is 7700. If one of the numbers is 275, then the other is:

- [A] 279
- [B] 283
- [C] 308
- [D] 318

Answer Option [C]

Explanation:

$$\text{Other number} = \left(\frac{11 \times 7700}{275} \right) = 308.$$

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Q. 20 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 Option [D]

Explanation:

L.C.M. of 6, 9, 15 and 18 is 90.

Let required number be $90k + 4$, which is multiple of 7.

Least value of k for which $(90k + 4)$ is divisible by 7 is $k = 4$.
∴ Required number = $(90 \times 4) + 4 = 364$.

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Q. 21 **The G.C.D. of 1.08, 0.36 and 0.9 is:**

- [A] 0.03
- [B] 0.9
- [C] 0.18
- [D] 0.108

Answer Option [C]

Explanation:

Given numbers are 1.08, 0.36 and 0.90. H.C.F. of 108, 36 and 90 is 18,
∴ H.C.F. of given numbers = 0.18.

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Q. 22 The H.C.F. of $\frac{9}{10}$, $\frac{12}{25}$, $\frac{18}{35}$ and $\frac{21}{40}$ is:

- [A] $\frac{3}{5}$
- [B] $\frac{252}{5}$
- [C] $\frac{3}{1400}$
- [D] $\frac{63}{700}$

Answer Option [C]

Explanation:

Required H.C.F. = $\frac{\text{H.C.F. of } 9, 12, 18, 21}{\text{L.C.M. of } 10, 25, 35, 40} = \frac{3}{1400}$

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Q. 23 **The greatest number of four digits which is divisible by 15, 25, 40 and 75 is:**

- [A] 9000
- [B] 9400
- [C] 9600
- [D] 9800

Answer Option [C]

Explanation:

Greatest number of 4-digits is 9999.
L.C.M. of 15, 25, 40 and 75 is 600.
On dividing 9999 by 600, the remainder is 399.
∴ Required number $(9999 - 399) = 9600$.

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Q. 24 **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

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Answer Option [B]

Explanation:

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

Then, $13a \times 13b = 2028$

$\Rightarrow ab = 12$.

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

[Note: Two integers a and b are said to be **coprime** or relatively prime if they have no common positive factor other than 1 or, equivalently, if their greatest common divisor is 1.]

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

Clearly, there are 2 such pairs.

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Q. 25 What will be the least number which when doubled will be exactly divisible by 12, 18, 21 and 30 ?

[A] 196

[B] 630

[C] 1260

[D] 2520

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Answer Option [B]

Explanation:

L.C.M. of 12, 18, 21 30

2 | 12 - 18 - 21 - 30

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Q. 26 Find the lowest common multiple of 24, 36 and 40.

[A] 120

[B] 240

[C] 360

[D] 480

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Answer Option [C]

Explanation:

2 | 24 - 36 - 40

2 | 12 - 18 - 20

2 | 6 - 9 - 10

3 |

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Q. 27 Which of the following fraction is the largest ?

[A] $\frac{7}{8}$

[B] $\frac{13}{16}$

[C] $\frac{31}{40}$

[D] $\frac{63}{80}$

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Answer Option [A]

Explanation:

L.C.M. of 8, 16, 40 and 80 = 80.

$$\frac{7}{8} = \frac{70}{80} ; \frac{13}{16} = \frac{65}{80} ; \frac{31}{40} = \frac{62}{80}$$

Since, $\frac{70}{80} > \frac{65}{80} > \frac{63}{80} > \frac{62}{80}$, so $\frac{7}{8} > \frac{13}{16} > \frac{63}{80} > \frac{31}{40}$

So, $\frac{7}{8}$ is the largest.

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Q. 28 Reduce $\frac{128352}{238368}$ to its lowest terms.

[A] $\frac{3}{4}$

[B] $\frac{5}{13}$

[C] $\frac{7}{13}$

[D] $\frac{9}{13}$

Answer Option [C]

Explanation:

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Q. 29 A, B and C start at the same time in the same direction to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and c in 198 seconds, all starting at the same point. After what time will they again at the starting point ?

[A] 26 minutes and 18 seconds

[B] 42 minutes and 36 seconds

[C] 45 minutes

[D] 46 minutes and 12 seconds

Answer Option [D]

Explanation:

L.C.M. of 252, 308 and 198 = 2772.

So, A, B and C will again meet at the starting point in 2772 sec. i.e., 46 min. 12 sec.

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Q. 30 The greatest possible length which can be used to measure exactly the lengths 7 m, 3 m 85 cm, 12 m 95 cm is:

[A] 15 cm

[B] 25 cm

[C] 35 cm

[D] 42 cm

Answer Option [C]

Explanation:

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

