HCF FOR LCM_CSAT_ANSWER EXPLANTIONS

Answer 1: (B)
$P = 2^3.3^{10}.5$, $Q = 2^5.3.7$
$HCF = 2^3.3$

Answer 2: (D)
Let the numbers be 4x and 5x.
But, HCF = 3
So, the numbers are 4x = 12 and 5x = 15
Hence, LCM of 12 and 15 is 60

Answer 3: (A)
LCM of 28 and 42 = 84
HCF of 28 and 42 = 14
Required ratio = 84 : 14 = 6 : 1

Answer 4: (A)
$x^2 + 2x - 8 = x^2 + 4x - 2x - 8$
$= x(x + 4) - 2 (x + 4)$
$= (x - 2)(x + 4)$
And, $x^3 - 4x^2 + 4x = x^3 - 2x^2 - 2x^2 + 4x$
$= x^2 (x - 2) - 2x (x - 2)$
$= (x^2 - 2x) (x - 2)$
$= x(x - 2)(x - 2)$
And, $x^2 + 4x = x (x + 4)$
Now, LCM of $x^2 + 2x - 8$, $x^3 - 4x^2 + 4x$ and $x^2 + 4x$
$= x(x - 2) (x + 4) (x -2) = x (x + 4) (x - 2)^2$

Answer 5: (D)
Let the numbers be 4x and 4y.
Then, LCM = 4xy = 120
$\Rightarrow$ xy = 30
Possible pairs are: (1, 30), (2, 15), (3, 10), (5, 6)
Given: one number is in between 5 and 11
So, first number = 2 × 4 = 8
Hence, second number = 15 × 4 = 60
Therefore, required sum = 8 + 60 = 68

Answer 6: (D)
Let the numbers be x and (x + 10).
Now, LCM × HCF = First number × Second number
$\Rightarrow 495 \times 5 = x.(x + 10)$
$\Rightarrow x^2 + 10x = 2475$
$\Rightarrow x^2 + 10x - 2475 = 0$
$\Rightarrow x^2 + 55x - 45x - 2475 = 0$
$\Rightarrow x(x + 55) - 45(x + 55) = 0$
$\Rightarrow x - 45 = 0$
$\Rightarrow x = 45$
Hence, numbers are 45 and 55.
Therefore, required sum = 45 + 55 = 100

Answer 7: (D)
According to question,
L = 84H and L + H = 680
$\Rightarrow$ 84H + H = 680
$\Rightarrow$ 85H = 680
$\Rightarrow$ H = 8
So, L = 680 - 8 = 672
$\therefore$ Second number = $\frac{672 \times 8}{56}$ = 96

Answer 8: (A)
Required number = (LCM of 12 and 16) – 5= 48 – 5 = 43

Answer 9: (A)
Let the numbers be 4x and 4y, where x and y re co-prime numbers.
Now, LCM = 4xy = 120
$\Rightarrow$ xy = 30
Hence, possibe pairs = (1, 30), (2, 15), (3, 10), (5, 6)

Answer 10: (C)
Required number = (LCM of 12 and 16) × k + 3 = 48k + 3
Hence, numbers = 51, 99, 147, 195, 243, 291, 339, 387

Answer 11: (D)
Since the difference between the divisor and the remainder in each case is 1.
So, the required number = (LCM of 2, 3, 4, 5, 6) × k - 1 = 60k - 1
Hence, numbers = 59, 119, 179, 239, 299, 359

Answer 12: (B)
Numbers are: 12 × 9 = 108; 11 × 9 = 99

Answer 13: (B)
Let the numbers be 2x, 3x and 4x respectively.
$\therefore$ HCF (x) = 15
2 × 15 = 30
3 × 15 = 45,
4 × 15 = 60
$\therefore$ LCM of 30, 45, 60 = 180

Answer 14: (C)
Required answer = HCF of (91 - 43), (183 - 91) and (183 - 43)
= HCF of 48, 92 and 140 = 4

Answer 15: (D)
LCM of (3, 4, 5, 6, 7, 8) = 3 × 4 × 5 × 7 × 2 = 840
⇒ Now, divided 10000 by 840, we get 760 as a remainder.
Here, two possibilities are:
10000 - 760 = 9240
or, 10000 + (840 - 760) = 10080
So, nearest number = 10080

Answer 16: (C)
Let the required numbers be 33a and 33b.
Then, 33a + 33b = 528
⇒ a + b = 16
Now, co-prime numbers are = (1, 15), (3, 13), (5, 11) and (7, 9)
∴ Required numbers = (33 × 1, 33 × 15), (33 × 3, 33 × 13), (33 × 5, 33 × 11), (33 × 7, 33 × 9)
Hence, number of such pairs is 4.

Answer 17: (D)
Let the numbers be 26a and 26b.
Then, 26a × 26b = 8112
⇒ ab = 12
Now, number of co - primes pairs are (1, 12) and (3, 4).
Clearly, there are 2 such pairs.

Answer 18: (A)
Let the numbers be 63x and 63y, where x and y are co-prime.
∴ 63x + 63y = 756
$\Rightarrow x + y = \frac{756}{63} = 12$
Hence, possible pairs are = (1, 11), (5, 7)
Therefore, number of possible pairs = 2

Answer 19: (D)
L.CM of (2, 3, 4, 5, 6) = 60
Now, when 2021 is divided by 60, the remainder is 41.
So, the number that has to be added to 2021 will be (60 - 41) = 19

Answer 20: (A)
Let numbers be a and b.
a + b = 225
$\text{Also, } a - b = \frac{225}{9} = 25$
A = 125, b = 100
LCM of (125, 100) = 500

Answer 21: (C)
The LCM of 2, 3, 6, 9, 10, 12, 15 = 180
∴ Required number = 180/2 = 90

Answer 22: (D)
Required answer = HCF of 165, 105 and 195 = 15 litre

Answer 23: (A)
The Number of bottle sizes possible would be given by the number of factors of the HCF.
Factors of HCF = 1, 3, 5, 15
Thus, a total of 4 bottle sizes are possible.

Answer 24: (C)
HCF of 165, 105 and 195 = 15 litre
∴ Minimum number of rows = 165/15 + 105/15 + 195/15 = 11 + 7 + 13 = 31

Answer 25: (C)
Required number of rows = $\sqrt{13225}$ = 115

Answer 26: (B)
LCM of 12, 15 and 18 = 180
Divide 1000 by 180, remainder = 100
Least 4 digits number = 1000 + (180 - 100) = 1080

Answer 27: (C)
The greatest number of 4 digits = 9999
Now, we divide 9999 by 666, we get 9 as a remainder
Thus, when 9999 – 9 = 9990 is divided by 666, no remainder is left.
Hence, greatest number of 4 digits = 9990 + 7 = 9997

Answer 28: (A)
N = HCF of (4665 - 1305), (6905 - 4665) and (6905 - 1305)
= HCF of 3360, 2240 and 5600 = 1120
∴ Sum of digits in N = (1 + 1 + 2 + 0) = 4

Answer 29: (A)
Required number = (LCM of 8, 12 and 16) × K + 3 = 48k + 3
Least value of k for which (48k + 3) is divisible by 7 is 3
Hence, required number = 48 × 3 + 3 = 147

Answer 30: (D)
Required time = LCM of 252, 308 and 198
= 2772 second = 46 minutes 12 seconds

Answer 31: (A)
Required number = HCF of 1067 and 1261 = 97

Answer 32: (D)
LCM of 12, 15, 18 = 180 seconds = 3 min
Required time = 10:20 am + 3 × 9 = 10:20 am + 27 min = 10:47 am
9^{th} time they will change their colour at 10:47 am