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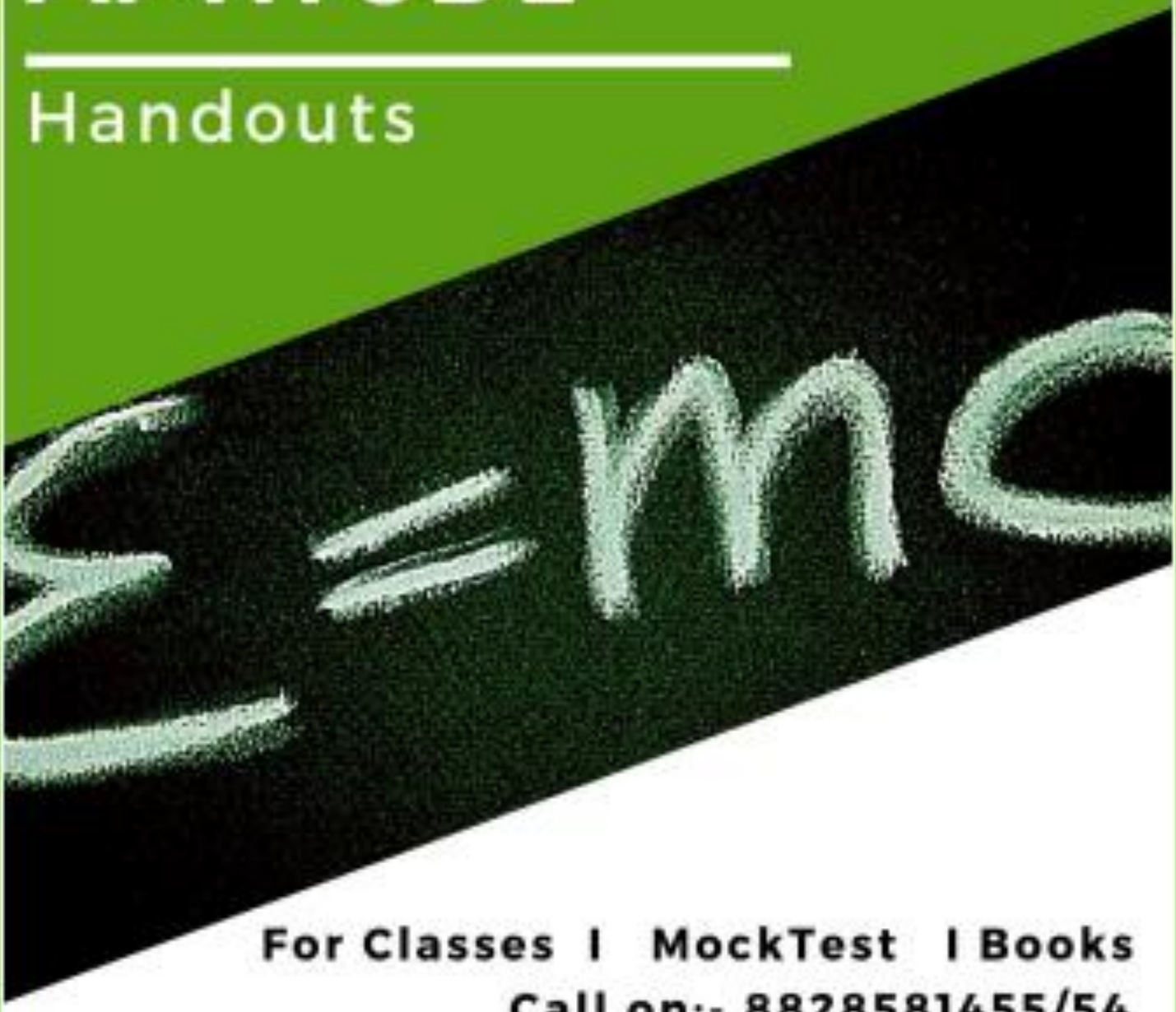
The Career Signature

QUANTITATIVE APTITUDE

Handouts



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LCM and HCF :

1. L.C.M OF 2^5 X 3^2 X 5^3 and 2^4 x 57 x 13 is :

(a) 2^5 x 3^2 x 5^3 x 13 x 7 x 19

(b) 2^4 x 5

(c) 2^7 x 3 x 5^2 x 13 x 7

(d) 2^5 x 3^2 x 5^3 x 13 x 19

2. H.C.F of 2^3 x 3^4 x 5^5 x 7 and 2^4 x 3^2 x 5 x 13

(a) 90 (b) 180 (c) 360 (d) 720

3. L.C.M OF $\frac{1}{4}, \frac{5}{8}, \frac{5}{16}, \frac{15}{32}$

(a) $\frac{5}{54}$ (b) $\frac{5}{32}$ (c) $\frac{10}{3}$ (d) $\frac{15}{4}$

4. G.C.D of $\frac{1}{4}, \frac{5}{8}, \frac{5}{16}, \frac{15}{32}$

(a) $\frac{1}{16}$ (b) 12 (c) $\frac{15}{32}$ (d) $\frac{1}{32}$

5. The L.C.M. of two numbers is 1820 and their H.C.F. is 26. If one number is 130 then the other number is :

(a) 70 (b) 1690 (c) 364 (d) 1264

6. The least number, which when divided by 12, 15, 20 or 54 leaves a remainder of 4 in each case, is :

(a) 450 (b) 454 (c) 540 (d) 544

7. 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

8. 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

9. Two numbers are in the ratio 3 : 4. The product of their H.C.F. and L.C.M. is 2028. The sum of the numbers is

(a) 68 (b) 72 (c) 86 (d) 91

10. Three electronic devices make a beep after every 48 seconds, 72 seconds and 108 seconds respectively. They beeped together at 10 a.m. The time when they will next make a beep together at the earliest is

(a) 10 : 07 : 12 hours (b) 10 : 07 : 24 hours (c) 10 : 07 : 36 hours (d) 10 : 07 : 48 hours

11. The smallest number, which when increased by 5 is divisible by each of 24,32, 36 and 54, is

(a) 869 (b) 859 (c) 4320 (d) 427

12. The HCF and LCM of two numbers is 2 and 70 respectively. If the sum of the numbers is 24, Find the smallest of the two numbers.

(a) 14 (b) 10 (c) 7 (d) 12

13. The greatest number that will divide 82, 111 and 140 leaving the same remainder in each case is

(a) 58 (b) 47 (c) 31 (d) 29

14. Rohini has three pieces of thread of length 15 m, 18 m & 24 m. She is asked to cut them into smaller pieces of equal length such that no piece of thread gets wasted. Find minimum number of smaller threads she will get.

(a) 19 (b) 72 (c) 24 (d) 15

15. The HCF of two positive integers is 24. Which of the following cannot be their LCM ?

(a) 180 (b) 312 (c) 240 (d) 168

16. The sum of two numbers is 50 and their HCF is 10. The number of values the LCM can take is :

(a) 1 (b) 2 (c) 4 (d) 5

17. The least multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15 & 18 is :

(a) 77 (b) 91 (c) 196 (d) 364

18. A number when divided by 6 leaves a remainder of 5, when divided by 5 leaves a remainder of 4, when divided by 4 leaves a remainder of 3, when divided by 3 leaves a remainder of 2, when divided by 2 leaves a remainder of 1. Find the number.

(a) 59 (b) 49 (c) 29 (d) 19

19. Let N be the greatest number that will divide 1305, 4665 and 6905, leaving the same remainder in each case. Find N.

(a) 1120 (b) 2350 (c) 1615 (d) 890

20. The sum of two numbers is 216 and their HCF is 27. The numbers are

(a) 27, 189 (b) 54, 162 (c) 108, 108 (d) 81, 189

Answer:

1.d	2.c	3.d	4.d	5.c	6.d	7.a	8.a	9.d	10.a
11.b	12.b	13.d	14.a	15.a	16.b	17.d	18.a	19.a	20.a

Solutions :

1. First number is $2^5 \times 3^2 \times 5^3$

& Second number is $2^4 \times 57 \times 13 = 2^4 \times 3 \times 19 \times 13$

To find the LCM, take Highest powers of all prime factors of the two numbers.

So

$\therefore \text{LCM} = 2^5 \times 3^2 \times 5^3 \times 13 \times 19$

So option (d) is correct.

2. First number is $2^3 \times 3^4 \times 5^5 \times 7$

& Second number is $2^4 \times 3^2 \times 5 \times 13$

To find the HCF, take Lowest powers of only common prime factors of the two numbers.

∵ Common prime factors of two numbers are 2, 3 & 5.

∴ HCF $= 2^3 \times 3^2 \times 5 = 8 \times 9 \times 5 = 360$

So option (c) is correct.

3. LCM of Fractions = $\frac{LCM\ of\ all\ numerators}{HCF\ of\ all\ denominators}$

∴ LCM OF $\frac{1}{4}, \frac{5}{8}, \frac{5}{16}, \frac{15}{32} = \frac{LCM\ of\ 1,\ 5\ \&\ 15}{HCF\ of\ 4,8,16\ \&\ 32}$

∴ $= \frac{15}{4}$

So option (d) is correct.

4. HCF(GCD) of Fractions = $\frac{HCF\ of\ all\ numerators}{LCM\ of\ all\ denominators}$

∴ HCF OF $\frac{1}{4}, \frac{5}{8}, \frac{5}{16}, \frac{15}{32} = \frac{HCF\ of\ 1,\ 5\ \&\ 15}{LCM of\ 4,8,16\ \&\ 32}$

∴ $= \frac{1}{32}$

So option (d) is correct.

5. According to the property of HCF & LCM, we have,

First Number x Second Number = HCF x LCM

∴ 130 x Second Number = 26 x 1820

∴ Second Number $= \frac{26*1820}{130}$

∴ $= \frac{1820}{5}$

∴ Second Number = 364

So option (c) is correct.

6. LCM of 12,15,20,54 = 540

Now, in each case the remainder is 4,

So the least number, which when divided by *12, 15, 20, 54 leave remainder of 4 in each case will be*

540 + 4 = 544

So option (d) is correct.

7. Observe that,

12 - 2 = 10, 16 - 6 = 10 & 24 - 14 = 10

Now LCM of 12, 16 and 24 is 48.

The greatest four digit number divisible by 48 will also be divisible by 12, 16 and 24. That's 9984.

Now, 9984 – 10 = 9974 will satisfy all the conditions in the given problem.

So option (a) is correct.

8. LCM of 5, 6, 8 & 9 = ?

5 = 1 x 5

6 = 1 x 2 x 3

8 = 1 x 2 x 2 x 2

9 = 1 x 3 x 3

LCM = 1 x 2 x 2 x 2 x 3 x 3 x 5 = 360 seconds = 6 minutes.

So option (a) is correct.

9. Two numbers are in the ratio 3 : 4.

∴ The numbers are 3x & 4x.

As per the property, we have,

First Number x Second Number = HCF x LCM

∴ $3x * 4x = 2028$

∴ $12x^2 = 2028$

∴ $x^2 = \frac{2028}{12}$

∴ $x^2 = 169$

∴ $x = 13$

Now, Sum of the numbers = 3x + 4x = 7x = 7 * 13 = 91

So option (d) is correct.

10. LCM of 48, 72 & 108 = ?

$48 = 2^4 \times 3$

$72 = 2^3 \times 3^2$

$108 = 2^2 \times 3^3$

$\therefore$ LCM = $2^4 \times 3^3 = 16 \times 27 = 432$ seconds = $\frac{432}{60} = \frac{420+12}{60}$ = 7 minutes & 12 seconds

As they beeped together at 10 a.m. they'll beep together again after 7 minutes & 12 seconds.

i.e. at 10 : 07 : 12 a.m.

So option (a) is correct.

11. LCM of 24, 32, 36, 54 = ?

$24 = 2^3 \times 3$

$32 = 2^5$

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

$54 = 2 \times 3^3$

$\therefore$ LCM $= 2^5 \times 3^3 = 32 \times 27 = 864$

$\therefore$ Required answer $= 864 - 5 = 859$

So option (b) is correct.

12. Let the numbers be x and y.

As per the property, we have,

First Number x Second Number = HCF x LCM

$\therefore x * y = 2 * 70$

$\therefore xy = 140$ ----------(1)

$\therefore x + y = 24$

$\therefore y = 24 - x$

Now, putting $y = 24 - x$ in equation (1), we get,

$x(24 - x) = 140$

$\therefore 24x - x^2 = 140$

$\therefore x^2 - 24x + 140 = 0$

$\therefore x = 14$ or $x = 10$

If we put, $x = 10$ then $y = 14$ and vice versa,

The smallest among the two is 10.

So option (b) is correct.

13. Using the formula,

The greatest number which divides three numbers x, y and z, leaving the same remainder in each case is given by HCF(x – y, y – z, z – x)

$\therefore$ 111 – 82 = 29

$\therefore 140 - 82 = 58$

$\therefore 140 - 111 = 29$

$\therefore$ HCF(29,58,29) = 29

So option (d) is correct.

14. She can get minimum number of such threads if 'the length of each smalller thread is maximum'.

For no piece to be wasted, the length should be a factor of 15, 18 and 24.

$\because$ HCF(15, 18, 24) = 3

$\therefore$ From the first thread, she'll get $\frac{15}{3} = 5$ pieces

$\therefore$ From the second thread, she'll get $\frac{18}{3} = 6$ pieces

$\therefore$ From the third thread, she'll get $\frac{24}{3} = 8$ pieces

$\therefore$ Total number of pieces $= 5 + 6 + 8 = 19$

So option (a) is correct.

15. The LCM has to be multiple of HCF.

$\because$ 180 is not divisible by 24.

$\therefore$ 180 cannot be the LCM.

So option (a) is correct.

16. Let the two numbers be x and y.

$\therefore x + y = 50$

& HCF(x,y) = 10

i.e. x and y are multiples of 10.

The following pairs of numbers satisfy the given condition.

(10, 40) & (20, 30)

∴ LCM can take 2 values.

So option (b) is correct.

17. LCM(6, 9, 15, 18) = 90

∴ The number is of the form $90x + 4$.

∴ $90x + 4$ should be a multiple of 7.

∴ By trial and error method, we get,

If $x = 1$, $90x + 4 = 94$ which is not divisible by 7.

If x = 2, 90x + 4 = 184 which is not divisible by 7.

If x = 3, 90x + 4 = 274 which is not divisible by 7.

If x = 4, 90x + 4 = 364 which is divisible by 7.

Hence, the number is 364.

So option (d) is correct.

18. On adding 1, the number should be divisible by 6, 5, 4, 3 and 2.

LCM of these numbers is 60.

Hence, the answer is 59.

So option (a) is correct.

19. Using the formula,

The greatest number which divides three numbers x, y and z, leaving the same remainder in each case is given by HCF(x – y, y – z, z – x)

$\therefore 4665 - 1305 = 3360$

$\therefore 6905 - 4665 = 2240$

$\therefore 6905 - 1305 = 5600$

$\therefore HCF(3360, 2240, 5600) = 1120$

So option (a) is correct.

20. Since, HCF is given as 27

Let the numbers be 27x and 27y.

$\therefore 27x + 27y = 216$ ----------[where x and y are co-primes]

$\therefore 27(x + y) = 216$

$\therefore x + y = \frac{216}{27}$

$\therefore x + y = 8$

$\therefore$ Their values can be (1, 7) or (3, 5)

$\therefore$ If $x = 1, 27x = 27$

& if $y = 2, 27y = 27 * 7 = 189$

So option (a) is correct.