

Chapter No. 1 & 2

Operation on Numbers:

1. The difference between the place value and the face value of 6 in the numeral 856973 is:
 A 973 B 6973 **C 5994** D none of these
2. The difference between the place value of 7 in the numeral 69758472 is:
 A 0 B 6993 **C 699930** D none of these
3. The unit digit in the product $(784 \times 618 \times 917 \times 463)$ is:
A 2 B 3 C 4 D none of these
4. What is the unit digit in 7^{105} ?
 A 1 B 5 **C 7** D 9
5. What is the unit digit in $(4137)^{754}$?
 A 1 B 3 C 7 **D 9**
6. $9\frac{3}{4} + 7\frac{2}{17} - 9\frac{1}{15} = ?$
 A $7\frac{719}{1020}$ B $9\frac{817}{1020}$ C $9\frac{719}{1020}$ **D $7\frac{817}{1020}$**
7. $(800 \div 64) \times (1296 \div 36) = ?$
 A 420 B 460 C 500 **D 450**
8. $\frac{768 \times 768 \times 768 + 232 \times 232 \times 232}{768 \times 768 - 768 \times 232 + 232 \times 232} = ?$
A 1000 B 536 C 500 D 268
9. If the number $517 * 324$ is completely divisible by 3, then the smallest whole number in place of * will be :
 A 0 B 1 **C 2** D None of these
10. If the number $97215 * 6$ is completely divisible by 11, then the smallest whole number in place of * will be :
A 3 B 2 C 1 D 5
11. Which one of the following numbers is completely divisible by 45 ?
 A 181560 B 331145 **C 202860** D 203550
12. Which one of the following numbers is completely divisible by 99 ?
 A 3572404 B 135792 C 913464 **D 114345**
13. How many of the following numbers are completely divisible by 132 ?
 264, 396, 462, 792, 968, 2178, 5184, 6336
A 4 B 5 C 6 D 7
14. 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 and 4 B 7 and 5 **C 8 and 5** D None of these
15. If a and b are odd numbers, then which of the following is even?
A a + b B a + b + 1 C ab D ab + 2
16. Which one of the following cannot be the square of a natural number?
 A 30976 B 75625 C 28561 **D 143642**
17. What smallest number should be added to 4456 so that the sum is completely divisible by 6?
 A 4 B 3 **C 2** D 1

18. Which natural number is nearest to 9217, which is completely divisible by 88?
 A 9152 **B 9240** C 9064 D 9184
19. The largest 4 – digit number exactly divisible by 88 is
A 9944 B 9768 C 9988 D 8888
20. The largest 5 – digit number exactly divisible by 91 is
 A 99921 **B 99918** C 99981 D 99971
21. On dividing a number by 68, we get 269 as quotient and 0 as remainder. On dividing the same number by 67, what will be the remainder?
 A 0 **B 1** C 2 D 3
22. On dividing a number by 56, we get 29 as remainder. On dividing the same number by 8, what will be the remainder?
 A 4 **B 5** C 6 D 7
23. The difference of two numbers is 1365. On dividing the larger number by the smaller, we get 6 as quotient and 15 as remainder. What is the smaller number ?
 A 240 **B 270** C 295 D 360
24. In a division sum , the remainder is 0. A student mistook the divisor by 12 instead of 21 and obtained 35 as quotient. What is the correct quotient?
 A 0 B 12 C 13 **D 20**
25. The sum of the two numbers is 12 and their product is 35. What is the sum of the reciprocals of these numbers ?
A $\frac{12}{35}$ B $\frac{1}{35}$ C $\frac{35}{8}$ D $\frac{7}{32}$
26. The difference between a positive proper fraction and its reciprocal $\frac{9}{20}$. The fraction is:
 A $\frac{3}{5}$ B $\frac{3}{10}$ **C $\frac{4}{5}$** D $\frac{5}{4}$
27. The difference of the squares of two consecutive even integers is divisible by which of the following integers?
 A 3 **B 4** C 6 D 7
28. If n is a natural number, then $(6n^2 + 6n)$ is always divisible by:
 A 6 only **B 6 and 12 both** C 12 both D 18 only
29. What will be the remainder when $(17)^{200}$ is divisible by 18?
 A 17 B 16 **C 1** D 2
30. If x and y are positive integers such that $(3x + 7y)$ is a multiple of 11, then which of the following will be divisible by 11?
 A $4x + 6y$ B $x + y + 4$ C $9x + 4y$ **D $4x - 9y$**
31. A number when divided successively by 4 and 5 leaves remainders 1 and 4 respectively. When it is successively divided by 5 and 4, then the respective remainder will be
 A 1, 2 **B 2, 3** C 3, 2 D 4, 1
32. A number when divided by 296 leaves 75 as remainder. When the same number is divided by 37, the remainder will be:
A 1 B 2 C 8 D 11
33. The sum of first 45 natural numbers is:
A 1035 B 1280 C 2070 D 2140
34. $(1 - \frac{1}{n}) + (1 - \frac{2}{n}) + (1 - \frac{3}{n}) + \dots$ up to n terms =?
 A $\frac{1}{2}n$ **B $\frac{1}{2}(n-1)$** C $\frac{1}{2}n(n-1)$ D none of these

35. The sum of how many terms of the series $6 + 12 + 18 + 24 + \dots$ is 1800?
 A 16 B 24 C 20 D 18
36. The sum of all two digit numbers divisible by 5 is
 A 1035 B 1245 C 1230 D 945
37. How many terms are there in the G. P. $3, 6, 12, 24 \dots 384$?
 A 8 B 9 C 10 D 11
38. $2 + 2^2 + 2^3 + \dots + 2^9 = ?$
 A 2044 B 1022 C 1056 D none of these
39. $(1^2 + 2^2 + 3^2 + \dots + 10^2) = ?$
 A 330 B 345 C 365 D 385
40. $(11^2 + 12^2 + 13^2 + \dots + 20^2) = ?$
 A 385 B 2485 C 2870 D 3255

H. C. F. and L. C. M Problem

- Which of the following has most number of divisors?
 A 99 B 101 C 176 D 182
- $\frac{1095}{1168}$ when expressed in simplest form is:
 A $\frac{13}{16}$ B $\frac{15}{16}$ C $\frac{17}{26}$ D $\frac{25}{26}$
- The H. C. F. of $4 \times 27 \times 3125$, $8 \times 9 \times 25 \times 7$ and $16 \times 81 \times 5 \times 11 \times 49$ is:
 A 180 B 360 C 540 D 1260
- L. C. M. of two prime numbers x and y ($x > y$) is 161. The value of $3y - x$ is:
 A -2 B -1 C 1 D 2
- 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
- The H. C. F. of $\frac{9}{10}, \frac{12}{25}, \frac{18}{35}, \frac{21}{40}$ is.
 A $\frac{3}{5}$ B $\frac{252}{5}$ C $\frac{3}{2800}$ D $\frac{63}{700}$
- The L. C. M. of $\frac{2}{3}, \frac{3}{5}, \frac{4}{7}, \frac{9}{13}$ is:
 A 36 B $\frac{1}{36}$ C $\frac{1}{1365}$ D $\frac{12}{455}$
- 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
- The L. C. M. of 3, 2.7 and 0.09 is
 A 2.7 B 0.27 C 0.027 D 27
- H. C. F. of 3240, 3600 and a third number is 36 and their L. C. M. is $2^4 \times 3^5 \times 5^2 \times 7^2$. The third number is:
 A $2^2 \times 3^5 \times 7^2$ B $2^2 \times 5^3 \times 7^2$ C $2^5 \times 5^2 \times 7^2$ D $2^3 \times 3^5 \times 7^2$
- Product of two co – prime numbers is 117. Their L. C. M. should be:
 A 1 B 117 C equal to their HCF D Cannot be calculated
- Three numbers are in the ratio 1: 2: 3 and their H. C. F. is 12. The numbers are:
 A 4, 8, 12 B 5, 10, 15 C 10, 20, 30 D 12, 24, 36

13. The sum of two numbers is 528 and their H. C. F. is 33. The number of pairs of numbers satisfying the above conditions is :
 A 4 B 6 C 8 D 12
14. 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
15. Three numbers are in the ratio 3: 4: 5 and their L. C. M is 2400. Their H. C. F is :
 A 40 B 80 C 120 D 200
16. The number of number – pair lying between 40 and 100 with their H. C. F. as 15 is:
 A 3 B 4 C 5 D 6
17. The H. C. F. and L. C. M. of two numbers are 84 and 21 respectively. If the ratio of the two number is 1: 4 , then the larger of the two numbers is:
 A 12 B 48 C 84 D 108
18. The greatest possible length which can be used to measure exactly the lengths 7m, 3m 85cm, 12m 95cm is:
 A 15 cm B 25 cm C 35 cm D 42 cm
19. Three different containers contain 496 liters, 403 liters and 713 liters of mixtures of milk and water respectively. What biggest measure can measure all the different quantities exactly?
 A 1 litre B 7 litres C 31 litres D 41 litres
20. The maximum number of students among student them 1001 pens and 910 pencils can be distributed in such a way that each student gets the same number of pens and same number of pencils is:
 A 91 B 910 C 1001 D 1911
21. A Rectangular courtyard 3.78 meters long and 5.25 meters wide is to be paved exactly with square tiles; all of the same size. What is the largest size of the tile which could be used for the purpose?
 A 14cms B 21 cms C 42 cms D none of these
22. 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
23. The smallest fraction, which each of $\frac{6}{7}, \frac{5}{14}, \frac{10}{21}$ will divide exactly is :
 A $\frac{30}{7}$ B $\frac{30}{98}$ C $\frac{60}{147}$ D $\frac{50}{294}$
24. The least number of five digits which is exactly divisible by 12, 15 and 18 is:
 A 10010 B 10015 C 10020 D 10080
25. The greatest number of four digits which is exactly divisible by 15, 25, 40 and 75 is:
 A 9000 B 9400 C 9600 D 9800
26. The smallest which when diminished by 7, is divisible 12, 16, 18, 21 and 28 is:
 A 1008 B 1015 C 1022 D 1032
27. The least number, which when divide by 12, 15, 20 and 54 leaves in each case remainder of 8, is:
 A 504 B 536 C 544 D 548
28. The least multiple of 7, which leaves remainder of 4, when divided by 6, 9, 15 and 18 is:
 A 74 B 94 C 184 D 364
29. The least number, which when divided by 48, 60, 72, 108 and 140 leaves 38, 50, 62, 98 and 130 as a remainders respectively is:
 A 11115 B 15110 C 15120 D 15210

30. find the least multiple of 23 which when divide by 18,21 and 24 lkeaves the remainder 7,10 and 13 respectively:

A 3002

B 3013

C 3024

D 3036

31. The least number which when divided by 5, 6, 7 and 8 leaves the remainder 3, but when divided by 9 leaves no remainder, is:

A 1677

B 1683

C 2523

D 3363

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

A 4

B 10

C 15

D 16

33. Four different electronic devices make a beep after every 30 minutes, 1 hour, $1\frac{1}{2}$ -hour and 1 hour 45 minutes respectively. All the device beeped together at 12 noon. They will again beep together at:

A 12 midnight

B 3 A. M.

C 6 A. M.

D 9 A. M.

34. 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 meet again at the starting point?

A 26 min. 18 sec B 42 min. 36 sec. C 45 min.

D 46 min. 12 sec.

ASB - Assignment (1)

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(1)

face value of 6 = 6×1000

place value of 6 = 6

$$\text{diff.} = 6000 - 6 = \underline{\underline{5994}} \quad \text{--- (C)}$$

(2)

There are two face values of 7 one is 700000 & 70.

$$\text{difference} = 700000 - 70 = 699930 \quad \text{--- (C)}$$

(3)

$$784 \times 618 \times 917 \times 463$$

$$4 \times 8 \times 7 \times 3 = 672$$

 \therefore the unit digit will be 2 --- (A)

(4)

$$(7)^{105} = ((7^4)^{26} \times 7)$$

$$7^4 = 2401$$

 $\therefore (7^4)^{26} \leftarrow$ will also have unit digit 1.

$$\therefore 7^{105} = 1 \times 7 = \boxed{7} \text{ as unit digit.}$$

(C)

(5)

$$(4137)^{754} = \underbrace{(4137)^{4188}}_{\substack{\text{unit digit} \\ 1}} \times \underbrace{(4137)^2}_{\substack{\text{unit} \\ \text{digit } 9}}$$

$$\therefore \text{unit digit of } (4137)^{754} = 9 \quad \text{--- (D)}$$

$$= \frac{39}{4} + \frac{121}{17} + \frac{136}{15}$$

$$= \frac{9945 + 7260 + 9248}{1020}$$

$$= \frac{7957}{1020} = \frac{817}{1020} \text{ — [D]}$$

(7) $(800 \div 64) \times (1296 \div 36)$

$$= \frac{12.5}{100} \times \frac{1296}{36}$$

$$= 12.5 \times 36$$

$$= 450 \text{ — [D]}$$

(8) $\frac{(768 + 232)((768)^2 - 768 \times 232 + (232)^2)}{(768)^2 - 768 \times 232 + (232)^2}$

$$= 1000 \text{ — [A]}$$

(9) $517 * 324$

$$5 + 1 + 7 + x + 3 + 2 + 4$$

$$(22 + x)$$

if ~~22~~ the sum = 24

$$x = 2 \text{ — [C]}$$

(10)

$$97215 \times 6$$

$$(9+2+5+6) - (7+1+x)$$

$$22 - 8 - x$$

$$14 - x$$

$$x = 3 \rightarrow \boxed{A}$$

(11)

For divisibility of 45, number must be divisible by 9 & 5

$$202860 \rightarrow \boxed{C}$$

sum of above no. = 18

so divisible by 9 & 5

(12)

for divisibility of 99, number must be divisible by 11 & 9

$\boxed{114345}$ is number divisible by 11 & 9
as $(1+4+4) - (1+3+5) = 9 - 9 = 0$, so
divisible by 11 & 9

~~Ans~~ Ans = D

(13)

for 132 the no. should be divisible by 3, 4, 11

✓ 264 → divisible by 3, 4, 11

✓ 396 → " " " " "

462 → not divisible by 4

✓ 792 → divisible by 3, 4, 11

968 → not divisible by 11, 3

1188 → not divisible by 4

5184 → " " " "

✓ 6336 → divisible by all

\therefore 4 nos. \rightarrow [A]

(14) $476**0$

$$4+7+6+x+y+0 = 17+x+y = 30$$

$$x=8; y=5$$

$$(4+6+y) - (7+x+0)$$

$$10+y-7-x$$

$$3+y-x=0$$

$$x=8, y=5 \quad \text{--- [C]}$$

(15) addition of odd no. is even

$$\therefore a+b \quad \text{--- [A]}$$

(16) 143642 because for a no. to be square root, unit must be 1, 4, 9, 6, 5
[D]

(17) $4456+2=4458$ which is divisible by 3 & 2 so it is divisible by 6.
[C]

(18) 9240

$$13-2=11 \text{ so divisible by 11}$$

$$240 \text{ divisible by 8}$$

$$\therefore \underline{9240} \quad \text{--- [B]}$$

- (19) 9944 is largest no. among all to be divisible by 88.

[A] 9944

1098

- (20) 91 | 99999

- 91

X 899

- 819

X 809

- 728

X 81

$$\therefore 99999 - 81 = 99918 \quad \text{--- [B]}$$

(21) $68 \times 269 + 0 = 18292$

$67 \times 271 = 18291$

remainder = 1

\therefore [B]

(22) $56x + 29 = A$

$(5x + 29) \div 8 = B$

$A \div B = R$

$29 \div 8 = B$

$$\begin{array}{r} 10 \\ 8 \overline{) 85} \\ \underline{80} \\ 5 \end{array}$$

remainder = 5 --- [B]

(23) big no. = x

small no. = y

$6y + 15 = x$

$x - 6y - 15 = 0$

$x - y = 1365$

$x - 6y = 15$

$x - y = 1365$

$y = 270$

$x = 1635$

so smaller no. = 270

option - B

(24)

$$12 \times 25 = 420$$

option - D

(25)

$$x + y = 12$$

$$xy = 35$$

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

$$x + \frac{35}{x} = 12$$

$$x^2 - 12x + 35 = 0$$

$$(x-5)(x-7) = 0$$

$$x=5 \rightarrow y=7$$

$$x=7 \rightarrow y=5$$

$$\text{reciprocal sum} = \frac{1}{5} + \frac{1}{7} = \frac{12}{35} \quad \boxed{A}$$

(26)

$$\frac{1}{x} + x = \frac{9}{20}$$

$$1 + x^2 = \frac{9}{20}x$$

$$20 + 20x^2 = 9x$$

$$20x^2 - 9x + 20 = 0$$

$$(4x+5)(5x-4) = 0$$

$$x = -\frac{5}{4}$$

$$x = \frac{4}{5} \quad \boxed{C}$$

(27) $(12)^2 - (10)^2 = 144 - 100 = 44$
divisible by 4 — (B)

(28) $6n^2 + 6n = 6n(n+1)$
divisible by 6 & 12 both
option - B

(29) $(17^{200} - 1^{200})$ divisible by $(17+1)$

\therefore but $(17^{200} - 1^{200})$ divisible by 18
 \therefore remainder = 1 — (C)

(30) let $x=5, y=1$

$3 \times 5 + 7 \times 1 = 22$ — ~~not~~ divisible by 11

Similarly $4x - 9y = 4 \times 5 - 9 \times 1 = 11$

\therefore option D

(31) $x = 4y + 1$

$y = 1 \times 5 + 4 = 9$

$x = 4 \times 9 + 1 = 37$

37 gives ~~not~~ remainder 2 & 3 when divided by 5 & 4.

(32) $y = 2969 + 35 = (37 \times 8 \times 9) + (37 \times 2 + 1)$
 $= 37(89 + 2) + 1$

\therefore remainder = 1 \therefore option - A

$$(33) \quad \frac{n(n+1)}{2} = \frac{45 \times 46}{2} = 1035$$

$$\begin{aligned} (34) \quad S_n &= \frac{n}{2} (2a + (n-1)d) \\ &= \frac{n}{2} \left(\frac{2}{n} + (n-1) \left(\frac{1}{n} \right) \right) \\ &= \frac{n}{2} \left(\frac{n+1}{n} \right) \\ &= \frac{n+1}{2} \end{aligned}$$

$$1+1+1 \dots = n$$

$$\frac{n - n+1}{2} = \frac{2n - n+1}{2} = \frac{n-1}{2} \quad \text{--- (B)}$$

$$(35) \quad S_n = 1800$$

$$d=6, a=6$$

$$1800 = \frac{n}{2} [12 + (n-1)6]$$

$$3600 = n(12 + (n-1)6)$$

$$3600 = n(12 + 6n - 6)$$

$$3600 = n(6n + 6)$$

$$3600 = 6n^2 + 6n$$

$$n^2 + n = 600$$

$$\cancel{n^2 + n - 600 = 0}$$

$$\cancel{n^2 + n - 600 = 0}$$

$$\boxed{n^2 + n - 600 = 0}$$

$$n^2 + n - 600 = 0$$

$$(n+25)(n-24) = 0$$

~~Ques~~

~~$n = -25$~~

$n = 24$

- [B]

(36) $10 + 15 + \dots + 95$

$95 = 10 + (n-1)5$

$85 = 5n - 5$

$90 = 5n$

$n = 18$

$$S_n = \frac{n}{2} [a + l] = \frac{18}{2} [10 + 95] = \underline{945}$$

(37) $T_n = ar^{n-1}$

$r = \frac{12}{6} = 2$

$384 = 3 \cdot 2^{n-1}$

$128 = 2^{n-1}$

$64 = 2^n$

$n = 8$

(38) $2 + 2^2 + 2^3 + \dots + 2^9$

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

$r = \frac{2^2}{2} = 2 \quad n = 9$

$$S_n = \frac{2(2^9 - 1)}{2 - 1} = 1022$$

- [B]

(39)

$$(1^2 + 2^2 + 3^2 + \dots + 10^2)$$

$$\Rightarrow \frac{n(n+1)(2n+1)}{6} = \frac{10 \times 11 \times 21}{6} = 385$$

(40)

$$(11^2 + 12^2 + 13^2 + \dots + 20^2)$$

$$\Rightarrow (1^2 + 2^2 + 3^2 + \dots + 20^2) - (1^2 + 2^2 + 3^2 + \dots + 10^2)$$

$$= \frac{20 \times 21 \times 41}{6} - \frac{10 \times 11 \times 21}{6}$$

$$= 2870 - 385$$

$$= 2485 \quad \text{--- (B)}$$

CH-2

$$(1) \quad 99 = 1 \times 3 \times 3 \times 11$$

$$101 = 1 \times 101$$

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

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

Hence, 176 has highest no. of divisors. --- (C)

(2)

$$\frac{1095}{1169} = \frac{3 \times 5 \times 73}{2 \times 2 \times 2 \times 2 \times 73} = \frac{15}{16} \quad \text{--- (B)}$$

(3)

$$4 \times 27 \times 3125 = 2^2 \times 3^3 \times 5^5$$

$$8 \times 9 \times 25 \times 7 = 2^3 \times 3^2 \times 5^2 \times 7$$

$$16 \times 81 \times 5 \times 11 \times 49 = 2^4 \times 3^4 \times 5 \times 11 \times 7^2$$

$$\text{HCF} = 2^2 \times 3^2 \times 5 = 180$$

option - (B)

- (4) Prime factor of 101 are 7 & 23
as $(x > y)$, $x = 23$, $y = 7$

$$3y - x = 21 - 23 = -2$$

option - A

- (5) LCM of 5, 6, 4, 3 is 60

$$\begin{array}{r} 60 \overline{) 2497} \\ \underline{- 240} \\ 97 \\ \underline{- 60} \\ 37 \end{array}$$

$$60 - 37 = 23$$

option - C

- (6) $\text{HCF} = \frac{\text{HCF of } (9, 12, 18, 21)}{\text{LCM of } (10, 25, 35, 40)}$

$$9 = 3 \times 3$$

$$12 = 3 \times 2 \times 2$$

$$18 = 3 \times 3 \times 2$$

$$21 = 7 \times 3$$

$$\text{HCF} = 3$$

$$10 = 5 \times 2, 25 = 5 \times 5, 35 = 7 \times 5, 40 = 2^2 \times 5$$

$$\text{LCM} = 1400$$

$$\text{HCF} = \frac{3}{1400}$$

(7) $\text{LCM} = \frac{\text{LCM of } 2, 3, 4, 9}{\text{HCF of } 3, 5, 7, 13}$

$$\text{LCM} = 36, \text{HCF} = 1$$

$$\text{LCM} = \frac{36}{1} = 36$$

option - A

(8) $\frac{108}{100}, \frac{36}{100}, \frac{90}{100}$

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

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

$$90 = 2 \times 5 \times 3^2$$

$$\text{GCD} = \frac{2 \times 3^2}{100} = \frac{18}{100} = 0.18 \quad \text{--- [C]}$$

~~(9) $3 \times 100 = 300$~~

~~$0.09 \times 100 = 9$~~

~~$2.7 \times 100 = 270$~~

~~$270 =$~~

(9) $3 \times 100 = 300$

$$0.09 \times 100 = 9$$

$$2.7 \times 100 = 270$$

$$300 = 2^2 \times 3 \times 5^2$$

$$9 = 3 \times 3$$

$$270 = 2 \times 3^3 \times 5$$

$$\text{LCM} = \frac{2^2 \times 3^3 \times 5^2}{100} = \frac{2700}{100} = 27$$

Option - D

$$(10) \quad 3240 = 2^3 \times 3^4 \times 5$$

$$3600 = 2^4 \times 3^2 \times 5^2$$

$$\text{HCF} \rightarrow 36 = 2^2 \times 3^2$$

As per LCM 3rd number must have $2^2 \times 7^2$

$$\text{Third no. is } 2^2 \times 3^5 \times 7^2 = 47628$$

Option - A

$$(11) \quad \text{HCF} = 1$$

$$\text{LCM} = 117$$

$$117 = 13 \times 9$$

LCM of 13 & 9 is 117 option - B

$$(12) \quad \text{HCF} = 1^2$$

$$x, 2x, 3x$$

$$x = 12$$

$$2x = 24$$

$$3x = 36$$

option - D

$$(13) \quad \text{let two nos be } 33x \text{ \& } 33y$$

$$33x + 33y = 528$$

$$x + y = 16$$

co-prime pairs with addition 16 are

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(1, 15) (3, 13) (5, 11) (7, 9)

pairs = 4

option - A

(14) HCF = 13

2 numbers be $13x$ & $13y$

$$(13x)(13y) = 2028$$

$$xy = 12$$

coprime pairs: (1, 12) (3, 4)

pairs: 2

option - B

(15) LCM = 602

$$602 = 2460$$

$$x = 40$$

nos. are 120, 160, 200

$$\text{HCF} = 40$$

option - A

(16) 15's multiple can be considered
45, 60, 75, 90

pair: (45, 60) (45, 75) (60, 75) (75, 90)

option - B

(17) Two nos are x & $4x$
 $\text{product} = \text{HCF} \times \text{LCM}$

$$4x^2 = 84 \times 21$$

$$x^2 = 21 \times 21$$

$$x = 21$$

$$4x = 84$$

option - C

$$(21) 378 = 2 \times 3^3 \times 7$$

$$525 = 5^2 \times 3 \times 7$$

$$\text{HCF} = 3 \times 7 = 21$$

option - B

$$(18) 700 = 7 \times 5 \times 5 \times 2 \times 2$$

$$385 = 5 \times 7 \times 11$$

$$1235 = 5 \times 7 \times 37$$

$$\text{HCF} = 7 \times 5 = 35$$

option - C

$$(22) N = \text{HCF} (466 - 1305)$$

$$\text{HCF} (6905 - 4665)$$

$$\text{HCF} (3360, 2240, 5600)$$

$$3360 = 2^5 \times 3 \times 5 \times 7$$

$$2240 = 2^6 \times 7 \times 5$$

$$5600 = 2^5 \times 5^2 \times 7$$

$$\text{HCF} = 2^5 \times 5 \times 7 = 1120$$

$$N = 1 + 1 + 2 + 0 = 21$$

Option - A

$$(19) 496 = 2^4 \times 31$$

$$403 = 13 \times 31$$

$$\text{HCF} = 31$$

$$\text{HCF of } 31 \text{ \& } 713 = 31$$

$$\text{max capacity} = 312$$

option - C

$$(23) \text{LCM of } 6/7, 5/14, 10/21$$

$$\text{LCM of } 6, 5, 10 = \frac{30}{7}$$

$$\text{LCM of } 7, 14, 21$$

option - A

$$(20) 1001 = 11 \times 91$$

$$910 = 2 \times 5 \times 91$$

$$\text{HCF} = 91$$

option - A

(24)

$$12 = 2^2 \times 3$$

$$15 = 3 \times 5$$

$$18 = 2 \times 3^2$$

$$\text{LCM of } 12, 15, 18 = 2^2 \times 3^2 \times 5$$

$$= 180$$

10000 is smallest 5 digit no.

$$\begin{array}{r} 55 \\ 180 \overline{) 10000} \\ \underline{9900} \\ 100 \end{array}$$

10080 is perfectly divisible by 180
quotient = 56

10080 \Rightarrow option - D

(25)

$$15 = 3 \times 5$$

$$25 = 5 \times 5$$

$$40 = 2^3 \times 5$$

$$75 = 3 \times 5^2$$

$$\text{LCM} = 2^3 \times 3 \times 5^2 = 600$$

$$\begin{array}{r} 16 \\ 600 \overline{) 9999} \\ \underline{9600} \\ 399 \end{array}$$

$$9999 - 399 = 9600 \rightarrow \text{option - C}$$

(26)

$$12 = 2^2 \times 3$$

$$16 = 2^4$$

$$18 = 2 \times 3^2$$

$$21 = 7 \times 3$$

$$28 = 2^2 \times 7$$

$$\text{LCM} = 2^4 \times 3^2 \times 7 = 1008$$

$$\text{req. no} = x$$

$$x - 7 = 1008$$

$$x = 1015$$

option - B

(27)

$$12 = 2^2 \times 3$$

$$15 = 3 \times 5$$

$$20 = 2^2 \times 5$$

$$54 = 2 \times 3^3$$

$$\text{LCM} = 540$$

$$\text{number} = \text{LCM} + 8$$

$$= 540 + 8 = 548$$

option - D

(28)

$$6 = 2 \times 3$$

$$9 = 3^2$$

$$15 = 3 \times 5$$

$$18 = 2 \times 3^2$$

$$\text{LCM} = 90$$

$$k = 24$$

$$\text{number} = (90 \times 4) + 4$$

$$= 364$$

option - D

(29)

$$48 = 2^4 \times 3$$

$$66 = 2^1 \times 3 \times 11$$

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

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

$$140 = 2^2 \times 5 \times 7$$

$$\text{LCM} = 15120$$

$$= 15120 - 10$$

$$= 15110$$

(30)

$$18 = 2 \times 3 \times 3$$

$$21 = 3 \times 7$$

$$\text{LCM} = 2^1 \times 3^2 \times 7 = 504$$

$$504 \times 6 - 11 = 2914$$

$$504 = 21 \times 23 + 21$$

$$\text{for } x=1$$

$$21 - 11 = 10$$

$$\text{for } x=2$$

$$21 \times 2 - 11 = 42 - 11 = 23 \times 1 + 8$$

$$\text{for } x=3$$

$$21 \times 3 - 11 = 63 - 11 = 23 \times 2 + 16$$

$$504 \times 6 - 11 = 3013$$

option - B

(31)

$$\begin{array}{r|rrrr}
 5 & 5 & 6 & 7 & 8 \\
 2 & 1 & 6 & 7 & 8 \\
 2 & 1 & 3 & 7 & 4 \\
 3 & 1 & 3 & 7 & 2 \\
 7 & 1 & 1 & 7 & 2 \\
 2 & 1 & 1 & 1 & 2 \\
 1 & 1 & 1 & 1 & 1
 \end{array}$$

$$\text{LCM} = 5 \times 2^3 \times 3 \times 7 = 840$$

$$\therefore 840k + 3$$

for $k=1$,

$$840 + 3 = 843$$

for $k=2$,

$$1680 + 3 = 1683$$

option - B

$$(32) \quad 2 = 2^1, \quad 4 = 2^2, \quad 12 = 2^2 \times 3, \quad 810 = 2 \times 3^4 \times 5$$

$$\text{LCM} = 120$$

$$\text{in 30 minutes} = \frac{30 \times 60}{120} = 15$$

$$\text{total} = 15 + 1 = 16$$

option - D

$$(33) \quad \text{LCM} = 2^2 \times 3^2 \times 5 \times 7 = 1260$$

$$1260 \text{ min} = \frac{1260}{60} = 21 \text{ hrs.}$$

$$12 \text{ pm} + 21 \text{ hrs} = 9 \text{ AM}$$

option - D

(34)

~~2000~~ ~~2000~~

$$LCM = 2772$$

$$2772 \text{ sec} = 46 \text{ min } 12 \text{ sec}$$

option - D~~2000~~

X