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Number System

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1. Find the sum of the smallest 4 digit number and the largest 5 digit number.
a) 199900 b) 100999 c) 211000 d) 211999
2. A positive integer which when added to 999 gives a sum which is greater than when it is multiplied by 999. Which of the following could be the value of the positive integer?
a) 3 b)4 c) 1 d) 2
3. What is the total number of prime numbers less than 100?
A) 25 b) 21 c) 29 d) 27
4. If $43p$ is divisible by 3, then what is the largest value p can take?
a) 8 b) 2 c) 5 d) 0
5. If the number $6pq5$ is divisible by both 3 and 5, which of the following digit can replace p and q ?
a) 5,9 b)9,5 c) 5,7 d) 9,7
6. There are 4 prime numbers written in ascending order. The product of the 1st 3 is 1001 and that of the last 3 is 2431. Find the 1st prime number.
a) 7 b) 11 c) 3 d) 5
7. What is the remainder when $41^2 \times 36^3 \times 31^2$ is divided by 15?
a) 2 b) 6 c) 4 d) 3
8. What must be added to 581173 to make it exactly divisible by 11?
a) 1 b) 2 c) 0 d) 3
9. An even number, total of whose digit's is 27, is always divisible by
a) 18 b) 9 c) 2 d) 6
10. By what least number 250 must be multiplied to get a multiple of 15.
a) 3 b) 5 c) 2 d) 15
11. What is the sum of all numbers between 250 and 550, which are divisible by 19?
a) 6635 b) 6640 c) 6000 d) 6695
12. A man is typing number 5 to 700 on his computer. How many times does he press the key of his computer?
a) 988 b) 1988 c) 1888 d) 1990
13. How many numbers between 1000 and 3050 are divisible by 24?
a) 86 b) 82 c) 78 d) 92
14. Find the number of prime factor contained in the product of $23^{11} \times 7^4 \times 3^5$.
a) 25 b) 17 c) 30 d) 20
15. A number when divided by 225 gives a remainder of 32. What will be the remainder when the same number is divided by 15?
a) 4 b) 2 c) 3 d) 1
16. Two numbers when divided by a certain divisor give remainder 35 and 20 respectively and when their sum is divided by the same divisor, the remainder is 15. Find the divisor.
a) 30 b)40 c) 35 d) 45
17. What is the smallest number by which 1250 be divided in order to make it a perfect square?
a) 5 b) 25 c) 2 d) 4
18. What is the smallest number by which 3000 be divided in order to make it a perfect cube?
a) 27 b) 9 c) 3 d) 6
19. What is the difference between the greatest and the smallest 5 digit number formed using the digits 7,0,3,4 and 2 without repeating the digits?
a) 65672 b)53978 c)54672 d) 65978

20. A boy had to do a multiplication. Instead of taking 35 as one of the multipliers, he took 53. As a result the product went up by 540. What is the new product?
- a) 1590 b) 1450 c) 1550 d) 1420

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1. Solution: (b)

The smallest 4 digit number = 1000
The largest 5 digit number = 99999
Required sum = 100999

2. Solution: (c)

Let the positive integer = x
Then, $999 + x > 999x$
By trial and error when $x = 1$
 $1000 > 999$
So, the required positive integer is 1.

3. Solution: (a)

The prime numbers less than 100 are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97. These add upto 25.

4. Solution: (a)

A number is divisible by 3 when sum of the digit's is divisible by 3.
 $4 + 3 + P = 7 + P$
so, P can be 2,5,8.
So, the largest value is 8.

5. Solution: (d)

If p is 9 and q is 7. The number is 6975. 6975 is divisible by both 3 and 5.

6. Solution: (a)

Let the 4 prime numbers be a, b, c, d.
 $abc = 1001$ and $bcd = 2431$
 $\frac{abc}{bcd} = \frac{1001}{2431} = \frac{7}{17}$
 $\frac{a}{d} = \frac{7}{17} \rightarrow a = 7$

7. Solution: (b)

41,36 and 31 when divided by 15, leave remainders 11,6 and 1 respectively.

$\therefore 41^2 \times 36^3 \times 31^2$ when divided by 15 leaves remainder

$$11^2 \times 6^3 \times 1^2 = 26136$$

As remainder cannot exceed divisor.

\therefore Remainder is 6 i.e, remainder obtained on dividing $\frac{26136}{15}$

8. Solution: (a)

Sum of digits at odd places (From left side)

$$5 + 1 + 7 = 13$$

Sum of digits at even places (From left side)

$$= 8 + 1 + 3 = 12$$

Whatever we add to the given number will increase the sum of digits which includes the unit digits i.e, to 12. If we add 1 to given number difference between the sum of digits become $13 - 12 = 1$

\therefore 1 is to added to the given number.

9. Solution: (a)

An even number is always divisible by 2.

Further any number sum of whose digit is 27 i.e ($2 + 7 = 9$) is always divisible by 9.

∴ The number is divisible by both 2 and 9.

∴ The number is divisible by $2 \times 9 = 18$

10. Solution: (b)

$$15 = 3 \times 5$$

∴ Any multiple of 15 must be divisible by 3 and 5.

$$250 = 2 \times 5 \times 5 \times 5$$

∴ 250 is divisible by 5 but not by 3.

So, 250, must be multiplied by 3 to make it a multiple of 15.

11. Solution: (c)

$$\text{Since, } 250 = 13 \times 19 + 3$$

$$\text{Terms divisible by 19 upto } 250 = 13$$

$$\text{And } 550 = 28 \times 19 + 18$$

∴ Terms divisible by 19 upto 550 = 28

$$\text{Total terms divisible by 19 between 250 and 550} = 28 - 13 = 15$$

$$\text{Mid term (average) between 250 to 550} = 400$$

$$\text{Sum of 15 terms} = 400 \times 15 = 6000$$

12. Solution: (b)

$$1 \text{ digit number from } 5 \text{ to } 9 = 5$$

$$2 \text{ digit number from } 10 \text{ to } 99 = 90$$

$$3 \text{ digit number from } 100 \text{ to } 700 = 601$$

$$\text{Total number of digits that are to be used} = (5 \times 1) + (90 \times 2) + (601 \times 3) = 1988$$

13. Solution: (a)

Quotient when 1000 and 3050 are divided by 24 are = 41 and 127

∴ Between 1000 and 3050 there are $127 - 41 = 86$ numbers.

14. Solution: (d)

$$\text{Number of prime factors} = 11 + 4 + 5 = 20$$

15. Solution: (b)

Let the number be N , $N = 225Q + 32$ where Q the Quotient can have the values 1, 2, 3 etc.

$$N = 15 \times 15Q + (15 \times 2) + 2$$

Divide N by 15 we see that the remainder is 2.

16. Solution: (b)

In such questions the divisor is $r_1 + r_2 - r_3$

$$\therefore \text{Divisor} = 35 + 20 - 15 = 40$$

17. Solution: (c)

$$1250 = 5 \times 5 \times 5 \times 5 \times 2$$

So, when 1250 is divided by 2 we get a perfect square

18. Solution: (c)

$$3000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 3$$

So, when 3000 is divided by 3 we get a perfect cube

19. Solution: (b)

The greatest 5 digit number that can be formed using the given digit = 74320

The smallest 5 digit number that can be using the given digit = 20342

$$\therefore \text{Required difference} = 74320 - 20342 = 53978$$

20. Solution: (a)

Let the number that the boy wanted to multiply be x .

He was expected to find the value of $35x$. Instead he found the value of $53x$.

The difference between the value that he got and what he was expected to get is 540

$$\text{i. e, } 53x - 35x = 450 \rightarrow x = 30$$

$$\text{The new product} = 30 \times 53 = 1590.$$

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