Quantitative Aptitude

Number System

Level-1

Q1 If 3A645B is divisible by 88, then what is the value of AxB?
(A) 20 (B) 24
(C) 22 (D) 25
(E) None of these

Q2 **Which of the following number is exactly divisible by 9?**
(A) 643125 (B) 642311
(C) 642321 (D) 123346
(E) None of these

Q3 The HCF and LCM of the two numbers are 90 and 480 respectively. If the first number is 160, then find the second number.
(A) 250 (B) 260
(C) 270 (D) 280
(E) None of these

Q4 The sum of five consecutive odd numbers is 1025. What is the sum of the next set of consecutive odd numbers?
(A) 1015 (B) 1025
(C) 1075 (D) 2000
(E) None of these

Q5 The prime factorisation of q has 2 and 3 only and HCF (q, 72) is 12. The number of values (s) q can take is
(A) 1 (B) 2
(C) 3 (D) 4
(E) 5

Q6 Find the largest 4-digit number which is divisible by 88.
(A) 8844 (B) 9999
(C) 9994 (D) 9930
(E) None of these

Q7 **If the number x6545y2 is divisible by 11, then what is the least value of x+y?**
(A) 4 (B) 5
(C) 3 (D) 2
(E) None of these

Q8 How many numbers between 90 and 750 could be divisible by 8?
(A) 102 (B) 82
(C) 92 (D) 70
(E) None of these

Q9 **A student multiplied a number by $\frac{1}{2}$ instead of $\frac{2}{3}$. What is the percentage error in the calculation?**
(A) 75% (B) 25%
(C) 50% (D) 12.5%
(E) None of these

Q10 If the number 48587X6 is completely divisible by 8 then the minimum value of X is equal to:
(A) 4 (B) 5
(C) 3 (D) 2
(E) None of these

Q11 Find the greatest possible length which can be used to measure exactly the lengths 90 cm, 80 cm and 60 cm.
(A) 10 (B) 12
(C) 16 (D) 18
(E) None of these

Q12 When 652 is divided by a positive integer x, the remainder is 12. How many values of x are there?
(A) 15 (B) 40
(C) 22 (D) 50
(E) None of these

Q13 If 61542X22 is exactly divisible by 3 then the minimum value which fits in the place of X is:
(A) 2 (B) 4
(C) 1 (D) 3
(E) None of these

Q14 Shruti forgot the last 2 digits of a 10-digit mobile number. If she randomly dials the final 2 digits after correctly dialing the first eight, then what is the chance of dialing the correct number?
(A) $\frac{1}{9}$
(B) $\frac{2}{9}$
(C) $\frac{1}{100}$
(D) $\frac{1}{81}$
(E) None of these

Q15 The LCM and HCF of the two numbers are 360 and 9 respectively and the difference between the two numbers is 27. Find the sum of the two numbers.
(A) 112 (B) 127
(C) 117 (D) 129
(E) None of these

Q16 The LCM of two positive numbers is 48 whereas their HCF is 4. If one number is 75% less than the other, then find the sum of the two numbers.
(A) 21 (B) 28
(C) 34 (D) 65
(E) 80

Q17 The difference between the two numbers is 603. When we divide the larger number by smaller, we get 7 as the quotient and 3 as the remainder. Find the larger number.
(A) 803 (B) 606
(C) 703 (D) 1203
(E) None of these

Q18 If 7 divides the integer n, the remainder is 5. Then, what will be the remainder when 9n is divided by 7?
(A) 4 (B) 3
(C) 1 (D) 5
(E) None of these

Q19 There are two digits, a and b, such that the product 4a1 x 25b is divisible by 36. The number of ordered pairs (a, b) is
(A) 11 (B) 22
(C) 18 (D) 10
(E) None of these

Q20 If the numerator of the fraction is increased by 20% by keeping the denominator the same, then what will be the net percentage change in the fraction?
(A) 20% (B) 30%
(C) 25% (D) 37.5%
(E) None of these

Level-2

Q1 Ratio of two numbers is 2: 15. If their LCM is 348 more than their HCF, then find the HCF of both the numbers?
(A) 18 (B) 10
(C) 15 (D) 12
(E) 20

Q2 LCM of two numbers is 150 and their HCF is 25. If one number is 50% more than the other number then what is the smaller number?
(A) 35 (B) 46
(C) 50 (D) 65
(E) None of these

Q3 Difference between the two numbers is 63. If their HCF is $33\frac{1}{3}\%$ of the smaller number and the smaller number is 10% of their LCM, then find the ratio of the smaller number to the bigger number?
(A) 1: 3 (B) 9: 20
(C) 3: 10 (D) 2: 5
(E) 5:7

Q4 There are 96 apples and 112 oranges. These fruits are packed in boxes in such a way that each box contains fruits of the same variety, and every box contains an equal number of fruits. Find the minimum number of boxes in which all the fruits can be packed.
(A) 12 (B) 13
(C) 25 (D) 15
(E) None of these

Q5 If the six-digit number 5ABB7A is a multiple of 33 for digits A and B, then Which of the following could be a possible value of A + B?
(A) 8 (B) 9
(C) 10 (D) 14
(E) None of these

Q6 If the HCF and LCM of two numbers are 10 and 30 respectively and the sum of these numbers is 40, then find the sum of the reciprocals of these numbers.
(A) $\frac{3}{19}$
(B) $\frac{2}{15}$
(C) $\frac{3}{17}$
(D) $\frac{4}{25}$
(E) None of these

Q7 A two digits number is 9 more than the sum of its digit. If twice of 9 is added to the number, the digits of the number are interchanged. Find the original number?
(A) 13 (B) 12
(C) 14 (D) 15
(E) 17

Q8 Sum of digits of a 3-digit number is 16 and when the digits of the number are interchanged it becomes 495 more than actual number. Find the number if it lies between 300 and 400.
(A) 376 (B) 367
(C) 349 (D) 358
(E) 385

Q9 The sum of the two-digit number is 7. When we interchange the digits, then the number is 2 more than twice of the new number. What is the difference between both the digits of the number?
(A) 5 (B) 2
(C) 3 (D) 8
(E) None of these

Q10 If the 6 digit numbers x64505 and 4357y4 are divisible by 11 and 72 respectively, then find the value of ($\frac{2x}{2}$ + 3y).
(A) 12 (B) 10
(C) 13 (D) 15
(E) None of these

Q11 A 5-digit number 13P7Q is divisible by 11 and P is 1 more than Q. What is the smallest number to

be subtracted from the number to make it divisible by 9?

(A) 7 (B) 4
(C) 5 (D) 2
(E) 9

Q12 If the eight-digit number 2575d568 is divisible by 54 and 87, the value of the digit 'd' is

(A) 4 (B) 7
(C) 0 (D) 8
(E) None of these

Q13 Product of digits of a 2-digit number is 24. If we add 45 to the number, the new number obtained is a number formed by interchanging the digits. What is the original number?

(A) 83 (B) 38
(C) 57 (D) 75
(E) None of these

Q14 Let two numbers be a and b such that the sum of LCM and HCF of these two numbers is 1260 and their LCM is 900 more than their HCF; find the product of two numbers.

(A) 203400 (B) 194400
(C) 198400 (D) 205400
(E) None of these

Q15 What is the least number which, when divided by the numbers 3, 5, 6, 8, 10 and 12, leaves in each case a remainder of 2 but, when divided by 22, leaves no remainder?

(A) 312 (B) 242
(C) 1562 (D) 1586
(E) None of these

Q16 There are two numbers of 6 digits and both are divisible by 22. The numbers are X6956Y and A765B2. If the value X, Y, A and B are the least possible values greater than zero, then find the value of (3A+2B-2X-4Y).

(A) 10 (B) -2
(C) -3 (D) -5
(E) None of these

Q17 There are seven consecutive even numbers. Among them, the sum of the average of the first two consecutive even numbers and the average of the last two consecutive even numbers is 72. What is the sum of the last five even consecutive numbers?

(A) 200 (B) 180
(C) 190 (D) 205
(E) 250

Q18 Sum of two numbers is 216 and $\frac{3}{10}$ of the larger number is equal to the $\frac{3}{8}$ of the smaller number. If 'x' is added to the larger number to make it a cube of 5 and 'y' is added to the smaller number to make it a square of 10, then find the product of 'x' and 'y'?

(A) 32 (B) 24
(C) 28 (D) 16
(E) 20

Q19 There are natural numbers x and y such that when y is divided by 5, the remainder is 4 and when x is divided by 5, the remainder is 2. The remainder is z when x + y is divided by 5. The value of $\frac{2z-5}{3}$ is

(A) 1 (B) -1
(C) 2 (D) -2
(E) None of these

Q20 If the greatest number that will divide 627 and 705 leaving the remainder 2 and 5 respectively is x, then find the value of ($\frac{3}{5}$ of x + 5).

(A) 20 (B) 15
(C) 24 (D) 28
(E) None of these

Level-3

Q1 A number x when divided by 361 leaves 20 as the remainder. The same number when divided by 19 leaves y as a remainder. Find the value of (6y+19).

(A) 20 (B) 22
(C) 25 (D) 28
(E) None of these

Q2 A scholar was asked to divide a number by 6 and add 12 to the quotient. He however first added 12 to the number and then divided it by 6, getting 112 as the answer. The correct answer should have been

(A) 110 (B) 122
(C) 130 (D) 142
(E) None of these

Q3 When a number is divided by 14, it gives remainder as 4 which is twice the remainder obtained when the same number is divided by 17. The quotient obtained when the given number is divided by 14 is 35 more than the quotient obtained when it is divided by 17. Find the number

(A) 3340 (B) 2160
(C) 2790 (D) 1760
(E) 3000

Q4 When a number p is divided by a divisor, it is found that the quotient is $\frac{58}{19}$ times of divisor and $\frac{58}{11}$ times of remainder. If the divisor is 38, then find the sum of the digits of p.

(A) 13 (B) 12
(C) 10 (D) 11
(E) None of these

Q5 **Direction: Study the data carefully and answer the following question.**

An equation is given below.

$99.9 \times 10.1 - 99.9 + 2000.1 \div 99.9 = x \times 45.94$

Find the approximate value of 'x' and find which of the following is/are true?

A: 'x' is a prime number.

B: 'x' lies between 11 and 19.

C: Di erence between the first and last digit of 'x' is 3.

(A) Only B and C (B) Only A and B
(C) Only A and C (D) All are true
(E) none is true

Q6 If $2^{2x}.2^3 - 33.2^x + 4 = 0$, then which of the following statement about x is true?

(A) Two integral values possible
(B) No integral value possible
(C) Only one integral value exist
(D) Three integral values possible
(E) None of these

Q7 If 'x' is added to the number 362 to make it divisible by 16 and 'y' is added to the number 615 to make it divisible by 13, then what should be added to the product of 'x' and 'y' to make it divisible by 19?

(A) 5 (B) 6
(C) 3 (D) 4
(E) 7

Q8 a, b, and c respectively are the 100th, 10^{th,} and unit digit of a three-digit number N and the sum of the digits is 14. b and c respectively are the tenth and unit digit of two digit number M. If the digit of M is interchanged, then the new number is $\frac{8}{3}$ times of M. If b is 40% of a, then find the value of N − M.

(A) 500 (B) 522
(C) 300 (D) 400
(E) None of these

Q9 **Direction: Study the data carefully and answer the following question.**

An equation is given below.

$2723.01 + 342.95 + x + 10.01 = 3499.94 - 340.04$

Solve the equation and find that which of the following is/are true?

A: 'x' is divisible by a prime number greater than 5.

B: 'x' is an odd number.

C: 'x' is divisible by 21.

(A) Only A and B (B) Only A and C

(C) Only B and C (D) None are true

(E) All are True

Q10 If A = 41% of 300 + 23 % of 200 and B=$\frac{2}{3}OF\ 264 - 2\frac{3}{4}OF\ 32$ Then 3A-4B is

I. An odd number divisible by 5

II. And even number divisible by 5

III. A number greater than 150

(A) Only I (B) Only II

(C) Both I and II (D) Both I and III

(E) none of these

Answer Key

Level-1

Q1	(B)	Q11	(A)
Q2	(C)	Q12	(B)
Q3	(C)	Q13	(A)
Q4	(C)	Q14	(D)
Q5	(A)	Q15	(C)
Q6	(C)	Q16	(B)
Q7	(A)	Q17	(C)
Q8	(B)	Q18	(B)
Q9	(B)	Q19	(A)
Q10	(C)	Q20	(A)

Level-2

Q1	(D)	Q11	(D)
Q2	(C)	Q12	(B)
Q3	(C)	Q13	(B)
Q4	(B)	Q14	(B)
Q5	(B)	Q15	(B)
Q6	(B)	Q16	(C)
Q7	(A)	Q17	(C)
Q8	(D)	Q18	(E)
Q9	(C)	Q19	(B)
Q10	(C)	Q20	(A)

Level-3

Q1	(C)	Q6	(A)
Q2	(B)	Q7	(C)
Q3	(C)	Q8	(A)
Q4	(D)	Q9	(B)
Q5	(E)	Q10	(D)

Hints & Solutions

Level-1

Q1 Text Solution:

For a number to be divisible by 88, it must be divisible by both 8 and 11.

A number is divisible by 8 if its last three digits are divisible by 8.

A number is divisible by 11 if the difference between the sum of the

digits in the odd positions and the sum of the digits in the even positions is either 0 or a multiple of 11.

So, in $3A645B$, the last three digits are 45B. For the number to be

divisible by 8, 45B must be divisible by 8. The multiples of 8 closest to 45 are 40 and 48. To make 45B divisible by 8, B must be the smallest digit such that 45B is greater than or equal to 48. The smallest such digit is B = 6.

Therefore, the number is 3A6456.

Now, we need to check whether the number is divisible by 11.

The sum of the digits in the odd positions is $3 + 6 + 5 = 14$

The sum of the digits in the even positions is $6 + 4 + A = 10 + A$. The difference between these two sums is

14 - (10 + A) = 0.

4 - A = 0

A = 4

The smallest value of A that satisfies this condition is $A = 4$.

Therefore, the value of A × B =24

Q2 Text Solution:

For a number to be divisible by 9, the sum of its digit should be divisible by 9.

So; $642321 = 6 + 4 + 2 + 3 + 2 + 1 = 18$

Hence 18 is divisible by 9.

So, 642321 is divisible by 9.

Q3 Text Solution:

Let the second be x

We know that the HCF of 160 and x is 90, and the LCM of 160 and x is 480.

HCF and LCM of two numbers:

HCF × LCM = product of the two numbers

$90 \times 480 = 160 \times x$

$x = \frac{90 \times 480}{160}$

$x = 270$

Q4 Text Solution:

Let the 5 consecutive numbers are x , x+2, x+4, x+6 and x+8

Given,

x + x + 2 + x + 4 + x + 6 + x + 8 = 1025

5x + 20 = 1025

x = $\frac{1005}{5}$ = 201

The next set of consecutive odd numbers are x+10 , x+12, x+14 , x+16 and x+18

Sum = 5x+70

= 5×201+ 70

= 1075

Q5 Text Solution:

HCF (72, q) = 12

So, q can be 12, 60, 84

But 60 and 84 has 5 and 7 also as a prime in its prime factorisation. So, there is only one value 12 which satisfies the condition.

Q6 Text Solution:

We know that the largest 4-digit number is 9999.

Divide 9999 by 88.

After dividing 9999 by 88, we get, 55 as a remainder

The number is completely divisible, only if the remainder is zero.

Hence, we can find the required answer subtracting the remainder obtained from the 4-digit number.

Therefore, required number = 9999 – 5 = 9994

Q7 Text Solution:

Number is divisible by 11 if and only if the alternating sum of its digit is either 0 or divisible

by 11.

So; $x + 5 + 5 + 2 = 6 + 4 + y$

$x + 12 = y + 10 - - - - - - - - - - - - - - (1)$

In equation (1); LHS =RHS, only when $x = 1 \ \& \ y = 3$

Therefore; $x + y = 3 + 1 = 4$

Q8 Text Solution:

Given: The numbers exist between 90 and 750 that are divisible by 8.

According to the arithmetic progression (A.P.) formula:

$a_n = a + (n-1)d$.

Here, a and a_n are the first and n^{th} term in the sequence, and d is the common difference between terms.

Calculation:

The numbers are between 90 and 750, divisible by 8:

96, 104, 112, 120,....., 744.

Where $a = 96$, $d = 8$ and $a_n = 744$

$=> \ 96 + (n-1)\ 8 = 744$

$=> \ 8n - 8 = 744 - 96$

$=> 8n = 656$

$=> n = \frac{656}{8}$

$=> n = 82$

Therefore, there are 82 numbers between 90 and 750 that can be divided by 8.

Q9 Text Solution:

Let the number be 6a

So, 6a$\times\frac{2}{3}$= 4a

= 6a$\times\frac{1}{2}$= 3a

Required percentage = $\frac{(4a-3a)}{4a}\times 100$ = 25%

Hence answer is option B

Q10 Text Solution:

A number is divisible by 8 if and only if the last three digits of the number form a multiple of 8

In the given number, 48587X6, last three digits are 7X6.

For the number to be divisible by 8, 7X6 should be divisible by 8.

Hence, the minimum value of X will be 3, then only $7X6 \ = 736/8, \ remainder \ will \ be \ 0.$

Q11 Text Solution:

Ans. 10

To find the greatest possible length which can be used to measure exactly the lengths 90 cm ,80 cm and 60 cm we need to find the Highest Common Factor of these three numbers

HCF$(90, 80, 60) = 10$

So; the greatest possible length is 10 cm

Q12 Text Solution:

Divisor = x

Dividend = 652

Remainder = 12

Divisor must be $652 - 12 = 640$

Number of divisor can be all the multiple factors of 16 upto 640 which means $640/16 = 40$

Hence 40 values of x is possible.

Q13 Text Solution:

A number is divisible by 3 if and only if the sum of its digits is divisible by 3.

In the given number, $61542X22$,

The sum of the digits is:

$6 + 1 + 5 + 4 + 2 + X + 2 + 2$

$= 22 + X$

For the number to be divisible by 3, $22 + x$ must be divisible by 3. The smallest value of x that satisfies this condition is 1, since $22 + 1 = 23$, which is not divisible by 3, but $22 + 2 = 24$, which is divisible by 3.

Therefore,

the minimum value of X that fits in the given number is $X = 2$.

Q14 Text Solution:

It is given that the last two digits are randomly dialed.

Then each of the digits can be selected out of 9 (0 to 9) digits in

9 ways.

[Probability = $\frac{\text{Total number of favorable outcomes}}{\text{Total number of outcomes}}$]

So, probability of dialing the 9th number correctly = $\frac{1}{9}$

And, probability of dialing the 10th number correctly = $\frac{1}{9}$

Hence required probability

= $\frac{1}{9} \times \frac{1}{9}$

= $\frac{1}{81}$

Q15 Text Solution:

Let the numbers be x and x + 27.

According to the question,

x (x + 27) = 360 × 9

$x^2 + 27x - 3240 = 0$

(x + 72) (x – 45) = 0

x = 45

Required sum = 45 + 72 = 117

Hence 117 is the right answer.

Q16 Text Solution:

Let the two numbers be 'a' and '0.75a'.

We know that (a × b) = LCM of (a, b) × HCF of (a, b)

So, a × 0.75a = 48 × 4

$0.75a^2 = 192$

Or, $a^2 = 256$

So, a = 16

So, required sum = {16 + (0.75 × 16)} = 28

Hence, option b.

Q17 Text Solution:

Let the smaller number be x. Then, the larger number is $x + 603$.

when we divide the larger number by the smaller, we get 7 as quotient and 3 as remainder. This can be written as:

$x + 603 = 7x + 3$

Simplifying this equation, we get:

$6x = 600$

$x = 100$

Therefore, the smaller number is 100 and the larger number is $x + 603 = 703$.

Q18 Text Solution:

If an integer n leaves a remainder of 5 when divided by 7, then we can write:

$n = 7a + 5$, where a is an integer.

Multiplying both sides by 9, we get:

$9n = 63a + 45$

When 63a is divided by 7, the remainder is zero. Therefore, we only need to consider the remainder when 45 is divided by 7.

$45 = 6 \times 7 + 3$

So, the remainder when 9n is divided by 7 is 3.

Q19 Text Solution:

4a1 ×25b is divisible by 36 means divisible by 4 and 9.

4a1 is not divisible by 4 in any case of a.

Hence, 25b should be divisible by 4.

So, possible values of b are 2 & 6.

Case-1: If b = 2, 252 is also divisible by 9.

Hence, 252 is divisible by 36.

So, the number of possible values of a is 10 (from 0 to 9)

Ordered pairs = 10

Case-2: If b = 6, 256 is not divisible by 9.

So 4a1 is divisible by 9.

the possible value of a is only 4.

Ordered pairs = 1

Total ordered pairs of (a, b) are = 10 + 1 = **11**

Q20 Text Solution:

If we keep the denominator the same then the percentage change in the fraction is the same as the change in the numerator.

So, 20% will be the correct answer.

Level-2

Q1 Text Solution:

Let the two numbers are 2x and 15x.

So, the LCM of the two numbers = 30x

And the HCF of the two numbers = x

From the question:

30x - x = 348

x = 12

So, the HCF of two numbers = 12

Q2 Text Solution:

Let the first number be x, Then the second number $= \frac{3x}{2}$

We know that, Product of numbers $= LCM \times \text{HCF}$

$x \times \frac{3x}{2} = 150 \times 25$

$\Rightarrow x^2 = \frac{150 \times 25 \times 2}{3}$

$\Rightarrow x = 50$

Hence the smaller number is 50.

Q3 Text Solution:

Let the LCM of both the numbers = 30x

So, the smaller number = 10% of 30x = 3x

The HCF of both the numbers = $33\frac{1}{3}$% of 3x = x

And the bigger number = (3x + 63)

Since,

LCM × HCF = Product of both the numbers

30x × x = 3x × (3x + 63)

30x = 9x + 189

x = 9

The smaller number = 3 × 9 = 27

The bigger number = 27 + 63 = 90

Required ratio = 27: 90 = 3: 10

Q4 Text Solution:

For a number of boxes to be the least, the number of fruits in each box should be maximum.

As per the given data, the number of fruits in each box is equal to the HCF of 96 and 112, i.e., 16.

Therefore, minimum number of boxes = $\frac{96}{16} + \frac{112}{16} = 13$

Q5 Text Solution:

A number is divisible by 33 if it is divisible by 3 and 11 both. For divisibility by 11,

∴ 5+ B +7=A+B+ A

∴ 2A= 12

⇒ A=6

∴ For divisibility of 5 6 B B76 by 3, B = 3

∴ Number = 563376 ·

∴ A+B=6+3=9

Q6 Text Solution:

Let the two numbers be a and b & assume that a is the smaller number.

HCF of a and b is 10, and the LCM of a and b is 30

$\text{a} \times b = HCF \times \text{LCM}$

$\text{a} \times b = 10 \times 30$

$\text{a} \times b = 300$

sum of the two numbers is 40

$a + b = 40$

Therefore;

$\frac{1}{a} + \frac{1}{b}$

$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{\text{ab}}$

$\frac{40}{300} = \frac{4}{30} = \frac{2}{15}$

Therefore, the sum of the reciprocals of a and b is $\frac{2}{15}$.

Q7 Text Solution:

Let the number = 10m + n

10m + n = m + n + 9

9m = 9

m = 1

and (10m + n) + (9 X 2) = (10n + m)

10m + n + 18 = 10n + m

10 + n + 18 = 10n + 1

9n = 27

n = 3

Required number = 10m + n = 10 X 1 + 3 = 13

Q8 Text Solution:

Since the number lies between 300 and 400 which means number must be start with 3.
Let the number be 300 + 10a + b
Accoridng to the question:
3 + a + b = 16
a + b = 13 ..... (1)
Number obtained after reversing its digits = 100b + 10a + 3
According to the question:
(100b + 10a + 3) - (300 + 10a + b) = 495
99b = 792
b = 8
a = 5
Hence, the number = 358

Q9 Text Solution:
Let the unit digit be x and the tens digit be y.
$x + y = 7$
Y = (7-x).....1
Number = $10y + x$
According to the question,
$10y + x = 2 + 2(10x + y)$
$10y + x = 2 + 20x + 2y$
$8y = 19x + 2$
From (1)
$8(7 - x) = 2 + 19x$
$54 = 27x$
$x = 2$
$y = 5$
Required difference $= 5 - 2 = 3$
Option '3' is the correct answer.

Q10 Text Solution:
For a number to be divisible by 11, the difference between the sum of the digits in the odd positions and the sum of the digits in the even positions must be a multiple of 11.
In the number x64505, the sum of the digits in the odd positions is $x + 4 + 0 = x + 4$, and the sum of the digits in the even positions is $6 + 5 + 5 = 16$.
For the number to be divisible by 11, $(x + 4) - 16 = x - 12$ must be a multiple of 11.
So, $x - 12$ will be divisible when x = 1 .
So, $1 - 12 = -11$, which is divisible by 11.
For a number to be divisible by 72 it must be divisible by both eight and nine to be divisible by 8 the last three digits of the number must be divisible by 8 to be divisible by 9 the sum of its digit must be divisible by 9
So, in the number 4357y4, last three digits are 7y4, so the possible value for which 7y4 is divisible by 8, when $y = 4$
For 435744, to be divisible by 9, the sum of digits should be divisible 9.
So; $4 + 3 + 5 + 7 + 4 + 4 = 27$.
Hence $y = 4$
Therefore $\frac{2x}{2}$ + 3y = $\frac{2\times1}{2}$ + 3(4) = 13

Q11 Text Solution:
If the number 13P7Q is divisible by 11.
So,
(1 + P + Q) - (3 + 7) = 0 or 11
P + Q = 9 or P + Q = 20
Case I: If, P + Q = 9
And, P - Q = 1
So, P = 5 and Q = 4
Case II: If, P + Q = 20
And P - Q = 1
So, P = 10.5 and Q = 9.5
Case II can be neglected.
So, the number is 13574.
After dividing the number by 9, it gives the remainder 2.
So, we should subtract 2 from the number to make it divisible by 9.

Q12 Text Solution:
54 = 2 × 3 × 3 × 3 = 2 × 3^3
87 = 3 × 29
2575d568 is divisible by 54 & 87
Hence it should also be divisible by 2, 3 & 29
Divisible by 2 → Even Number
Divisibility by 3
⇒ 2 + 5 + 7 + 5 + d + 5 + 6 + 8 = 38 + d
Hence d can be 1, 4, 7
If d = 1 or 4
25751568 and 25754568 are not divisible by 29
Hence d = 7 is correct

Q13 Text Solution:

Let the 2-digit number be 10x + y

xy = 24 .....eq1

10x + y + 45 = 10y + x

{The number obtained after interchanging the digits = 10y + x}

9y - 9x = 45

y - x = 5 .....eq2

Solving both eq1 and eq2

$\frac{24}{x} - x = 5$

$x^2 + 5x - 24 = 0$

$(x + 8)(x - 3) = 0$

x = 3 as negative value is not possible

As xy = 24; y = 8

Therefore, original number is 38

Q14 Text Solution:

Let LCM = ***x*** and HCF = y

According to question ***x*** + ***y*** = 1260 ...(i)

And ***x*** = ***y*** + 900

x- y =900 ....(ii)

Add equation (i) and (ii)

$\Rightarrow$2x = 2160

$\Rightarrow$ x = 1080

$\Rightarrow$y = 1080 -900 =180

Product of numbers = 1080 x 180 =194400

Q15 Text Solution:

LCM (3, 5, 6, 8, 10, 12) = $3 \times 5 \times 2 \times 4 = 120$

Required number is

$\Rightarrow \frac{120k+2}{22} = \frac{10k+2}{22}$

at k = 2, $\frac{10k+2}{22} \Rightarrow$ Remainder = 0

$\Rightarrow$ The given condition satisfies

$\Rightarrow 120 \times 2 + 2 = 240 + 2 = 242$

Q16 Text Solution:

$22 = 2 \times 11$

In which even numbers are divisible by 2. So the least value of Y possible is 2.

For x6956y to be divisible by 11;

$x + 9 + 6 - (6 + 5 + 2) = 11$

$x = 9$

For value of B to be least, B should be equal to 1.

For A76512 to be divisible by 11;

$A + 6 + 1 - (7 + 5 + 2) = 11$

$A + 7 - 14 = 11$

$A = 18$

Since A cannot be more than 11, so we have to subtract $18 - 11 = 7$ to get the desired output of A.

Therefore; $A = 7$

Therefore;

$3A + 2B - 2X - 4Y = 3(7) + 2(1) - 2(9) - 4(2) = -3$

Q17 Text Solution:

Let the six consecutive even numbers be x, x+2, x+4, x+6, x+8, x+10 and x+12.

According to the question,

$\frac{x+x+2}{2} + \frac{x+10+x+12}{2} = 72$

$4x + 24 = 72 \times 2$

$x = \frac{120}{4} = 30$

Sum of the last five even consecutive numbers = (x+4) + (x+6) + (x+8) + (x+10) + (x+12)

= 34 + 36 + 38 + 40 + 42 = 190

Hence "190" is the right answer.

Q18 Text Solution:

Let the larger number is 'a' and the smaller number is 'b'.

So,

a + b = 216 ---------(1)

And,

$\frac{3a}{10} = \frac{3b}{8}$

4a = 5b ----------(2)

From equations (1) and (2):

$a + \frac{4a}{5} = 216$

a = 120

From equation (1):

b = 96

Now, the value of 'x' = 5^3 - 120 = 5

And the value of 'y' = 10^2 - 96 = 4

So, the product of 'x' and 'y' = 5 × 4 = 20

Q19 Text Solution:

When x and y is divided by 5, the remainder is 2 and 4 respectively,

$\therefore$ y = 5Q + 4 ...(i)

$\therefore$ x = 5P + 2 ...(ii)

When x + y is divided by 5, the remainder is z

Adding Eq. (i) and (ii), we get

x + y = 5 (P + Q) + 6

Now when x + y is divided by 5, the remainder will be 1

z = 1

Hence the value of $\frac{2z-5}{3}=\frac{2(1)-5}{3}$ =-1

Q20 **Text Solution:**

If a number "x" divides 627 and 705 leaving remainders of 2 and 5 respectively, then we can write:

$627 = ax + 2$

$705 = bx + 5$

$ax = 625$

$bx = 700$

HCF of 625 and 700 will be 25

Therefore, the greatest number that divides 627 and 705 leaving the remainder 2 and 5 is 25

So; $x = 25$

Therefore,

$\frac{3}{5}of\ x + 5 = \frac{3}{5} \times 25 + 5$

$= 20$

Level-3

Q1 Text Solution:

Let the number be $(361 + 20) = 381$

So; when 381 is divided by 19 it will have 1 as remainder.

Hence; y = 1

Therefore; $6y + 19 = 6(1) + 19 = 25$

Q2 Text Solution:

Explanation

Let x be the given number

$\frac{x}{6}$ +12 should be the required answer

$\frac{x+12}{6}$ = 112

x = 660

Correct answer = $\frac{660}{6}$ + 12 = 122

Q3 Text Solution:

Let the number be 'x' and the quotient obtained when it is divided by 14 be 'y'.

Therefore, x = 14y + 4

Also, x = 17 × (y – 35) + 2

17y – 595 + 2 = 14y + 4

Or, 3y = 597

Or, y = 199

x = 14 × 199 + 4 = 2790

Hence, the correct option is C.

Q4 Text Solution:

$\frac{\text{Quotient}}{\text{Divisor}} = \frac{58}{19}$ $\frac{\text{Quotient}}{\text{Remainder}} = \frac{58}{11}$

Divisor = 38

Quotient=$\frac{58}{19} \times 38 = 116$

remainder=116×$\frac{11}{58}$=22

Dividend = (Quotient × Divisor) + Remainder

Dividend = (116×38) + 22 = 4430

Therefore, P = 4430

Sum of digits of P = 4 + 4 + 3 + 0 = 11

Q5 Text Solution:

From the equation:

$99.9 \times 10.1 - 99.9 + 2000.1 \div 99.9 = x \times 45.94$

$100 \times 10 - 100 + 2000 \div 100 = x \times 46$

$1000 - 100 + 20 = x \times 46$

$920 = x \times 46$

x = 20

From A:

Since, 20 is not a prime number.

So, A is not true.

From B:

Since, x = 20

So, B is not true.

From C:

Di erence between 1st and last digit of 20 = 2 - 0 = 2

So, C is not true.

Hence, none is true.

Q6 Text Solution:

$2^{2x} . 2^3 - 33 .2^x + 4 = 0$

Let $2^x = y$,

$8y^2 - 33\ y + 4 = 0$

$8y^2 - 32y\ - y + 4 = 0$

$8y(y - 4)\ - 1(y - 4) = 0$

$(8y - 1)\ (y - 4) = 0$

Either $(8y - 1) = 0$ or $(y - 4) = 0$

$\Rightarrow y = \frac{1}{8}$ or $y = 4$

$\Rightarrow 2^x = 2^{-3}$ or $2^x = 2^2$

$\Rightarrow x = -3\ or\ x = 2$.

Hence, two integral values of x exists.

Q7 Text Solution:

On dividing 362 by 16, the remainder is 10.

So, the number, which should be added to 362 to make it divisible by 16 = x = 16 - 10 = 6

On dividing 615 by 13, the remainder is 4.

So, the number, which should be added to 615 to make it divisible by 13 = y = 13 - 4 = 9

Now, the product of 'x' and 'y' = 6 × 9 = 54

On dividing 54 by 19, the remainder is 16.

So, the number, which should be added to 54 to make it divisible by 19 = 19 - 16 = 3

Q8 Text Solution:

N=100a + 10b + c and M = 10b + c

So, 10c+b=$\frac{8}{3}$ × [10b+c]

Or, 22c=77b

Or, $\frac{c}{b} = \frac{7}{2}$

So, c=7x and b=2x. so, a=$2x \times \frac{100}{40}$ = 5x

So, 14x=14, or, x=1

So, N=527 and M=27

So, N - M = 527 - 27 = 500

Q9 Text Solution:

From the equation:

$2723.01 + 342.95 + x + 10.01 = 3499.94 - 340.04$

$2723 + 343 + x + 10 = 3500 - 340$

$3076 + x = 3160$

x = 84

From A:

Factors of 'x' = 84 = 2 × 2 × 3 × 7

Since, 'x' is divisible by 7.

So, A is true.

From B:

Since, 84 is an even number.

So, B is not true.

From C:

Since, 84 is divisible by 21.

So, C is true.

Hence, only A and C are true.

Q10 Text Solution:

A=41$\times 3 + 23 \times 2 = 123 + 46 = 169$

B=$\frac{2}{3} of\ 264 - \frac{11}{4} of\ 32 = 88$

3A – 4B = 3 x 169 – 4 x 88=507-352 =155

From I, 155 is an odd number and divisible by 5

From II , 155 is not an even number

From III , 155 > 150

So, only I and III are true.