NUMBER SYSTEM

1. The number 23a7b is divisible by 55. Find the value of (a + b), if.
2. 4
3. 8
4. 7
5. 9

Ans: b

Solution: b= 5 ,23a75 => 7+3=10 and 2+a+5 = 10.; a=3

1. Find the remainder of 777 is divided by 344
2. 1
3. 49
4. 295
5. 7

Ans: c

1. The difference of two numbers is 5 and the difference of their squares is 135. The sum of the numbers is:
   * 1. 27
     2. 25
     3. 30
     4. 32

Ans: a

1. If the unit digit in the product 75? × 89 × 947 × 823 be 1, then the value of ? is
2. 1
3. 3
4. 7
5. 9

Ans: d

1. Find the number of zeroes at the end of 82!
2. 15
3. 16
4. 19
5. None of these

Ans: b

1. Find the last digit of 2824 + 2401 x 4096
2. 2
3. 3
4. 4
5. 6

Ans: a

Solution: 6+1\*6=2

1. In first 400 numbers those divisible by 2 are deleted and again those divisible by 5 are removed, how many numbers will be left now?
2. 170
3. 150
4. 160
5. 200

Ans: c

1. Find the unit digit of (264) ^202 + (364) ^303
2. 0
3. 2
4. 4
5. 6

Ans: a

Solution: 4^202 + 4^303 = 6 + 4 = 0

1. When a number is divided by 24, it leaves a remainder of 15. What will be the remainder when the number is divided by 8?
2. 6
3. 7
4. 5
5. None

Ans: b

Solution : N= 24Q + 15; rem((24Q+15)/8) = 7

1. 1025 - 4 is divisible by \_\_\_\_\_
2. 2
3. 3
4. 9
5. Both (a) and (b)

Ans: d

Solution: 1025 – 4 = 9999…..996 which is divisible by 2 & 3

1. There were seven thieves; each looted a bakery one after the other such that the first one takes ½ of the total no. of the breads plus 1/2 of bread. Similarly 2nd , 3rd , 4th , 5th, 6th and 7th also did the same. After the 7th attempt no bread remained at the bakery. How many breads were there initially?
2. 127
3. 255
4. 63
5. 256

Ans: a

**Exp:** 27-1 = 127

1. If the L.C.M of two numbers is 750 and their product is 18750, find the H.C.F of the numbers.
   * 1. 50
     2. 30
     3. 125
     4. 25

Ans: d

1. Sagar distributed a certain number of chocolates equally among five men. Each man distributed the chocolates he got equally among four women and each of the women found that if she distributed the chocolates equally among seven children she would have four chocolates left with her. Which of the following could be the number of chocolates Sagar distributed?
2. 400
3. 300
4. 500
5. 600

Ans: c

Solution: By option

1. What is the least number that leaves a remainder of 4 when divided by 8 or 9 or `10, but is completely divisible by 7?
2. 2884
3. 2254
4. 364
5. 3234

Ans: c

Solution: LCM(8,9,10) = 360 + 4 = 364 which is also divisible by 7.

1. Six bells commence tolling at the interval of 2, 4,6,8,10 and 12 seconds respectively. In an Hour

how many times do they toll together?

* 1. 29 times
  2. 60 times
  3. 120 times
  4. 30times

Ans: d

Solution: LCM(2,4,6,8,10,12 )=120 sec or 2 mins. In 60 mins they troll together for 60/2=30 times

1. The highest power of 12 that can divide 190! Completely is
2. 93
3. 92
4. 60
5. 16

Ans: b

Solution: Number of 2’s = 184, hence number of 4’s = 92. Number of 3’s = 93.

Hence highest power of 12 in 190! Is 92.

1. If X = remainder when( 1! + 2! + 3! + …… + 1000! ) is divided by 15. Find X.
   1. 4
   2. 3
   3. 6
   4. 9
   5. 7

Ans: b

Solution: 5! Onwards will give remainder 0. For 1!+2!+3!+4! = 33. Remainder = 3

1. What is the remainder when 299 is divided by 7?
2. 1
3. 2
4. 0
5. 3

Ans: a

Solution: 299 = 833 when divided by 7 gives remainder as 1.

1. Find the greatest 5-digit number which gives a remainder of 5 when divided by 8 or 9?
2. 99931
3. 99941
4. 99936
5. None of the above

Ans: b

Solution: LCM(8,9)=72, highest 5-digit multiple of 72 is 99936. Hence, 99936 + 5=99941

1. Find the total numbers between 1 and 1000 that are neither divisible by 8 nor by 12?
   1. 167
   2. 943
   3. 832
   4. 264

Ans: c

Solution: LCM(8,12)=24.

Number between 1 and 1000 that are divisible by 8 is 124.

Number between 1 and 1000 that are divisible by 12 is 83.

Number between 1 and 1000 that are divisible by 24 is 41.

Number between 1 and 1000 that are divisible by 8 or 12 is 124+83-41=166.

Hence number between 1 and 1000 that are not divisible by 8 or 12 is 998-166= 832

1. If ABC0 is a 4 digit number divisible by 4, then how many such 4 digit number exist?
   1. 360
   2. 400
   3. 450
   4. 500

Ans: c

Solution: A={1,2,3,4,5,6,7,8,9}; B ={0,1,2,3,4,5,6,7,8,9} ;C ={0,2,4,6,8}

Hence numbers possible are = 9\*10\*5=450

1. Ray writes a two digit number.  He sees that the number exceeds 4 times the sum of its digits by 3.  If the number is increased by 18, the result is the same as the number formed by reversing the digits.  Find the number.
   1. 35
   2. 42
   3. 49
   4. 57
   5. 97

Ans: a

Exp: Let the two digit number be xy.

4(x + y) +3 = 10x + y .......(1)

10x + y + 18 = 10 y + x ....(2)

Solving 1st equation we get 2x - y = 1 .....(3)

Solving 2nd equation we get y - x = 2 .....(4)

Solving 3 and 4, we get x = 3 and y = 5

1. What is the unit digit in {(637)1702 x (62)317 + (43491) x (68)176 + (64)317 x (49491)}?
   1. 2
   2. 4
   3. 6
   4. 8
   5. 0

Ans: c

Solution: 9 \* 2 \* 7 \* 6\*4\*9=6

1. What is the remainder when 358 is divided by 6?
   1. 4
   2. 5
   3. 0
   4. 3
   5. 6

Ans: d

Solution: rem(358/6)= 3\*rem(357/2) = 3\*1=3

1. I have 4 diamonds of weight 30, 60, 105 and 135gms each. What maximum value of weights should I use so as to weigh each one of them accurately, if I am allowed to use just one type of weight?
   1. 15
   2. 20
   3. 25
   4. 30
   5. 35

Ans: a

Solution: HCF of 30, 60, 105 and 135 = 15 gm

1. A number 44AB6 is divisible by 11 and B + A =8 . Find the least number that is to be subtracted from the above number to make it divisible by 9.
   1. 2
   2. 4
   3. 5
   4. 6
   5. None of these

Ans. b

Solution : 44AB6 is divisible by 11 then B-A=6 and B+A=8. Then A=1 and B=7. Number becomes 44176, to make it divisible by 9 we should subtract 4.

1. When writing numbers from 1 to 10,000, how many times is the digit 9 written?

A. 3200

B. 3600

C. 4000

D. 4200

Solution: Option(C) is correct

The digits 9 occurs in the thousands place in 1000 numbers. It occurs in the hundreds place in 1000 numbers and so on. The digit occurs 4000 times.

1. How many keystrokes are needed to type numbers from 1 to 1000 on a standard keyboard?

A. 3001

B. 2893

C. 2704

D. 2890

Ans: b)

Solution:

From 1 to 9 9\*1 = 9strokes

From 10 to 99 90\*2 = 180 strokes

From 100 to 999 900\*3 = 2700 strokes

For 1000 4 stokes

Total = 9 + 180 + 2700 + 4 = 2893 strokes

1. The product of 4 consecutive even numbers is always divisible by:

A. 600

B. 768

C. 864

D. 384

Ans: D)

Solution: To solve this question, we need to know two facts.

Fact 1: The product of 4 consecutive numbers is always divisible by 4!.

Fact 2:Since, we have 4 even numbers, we have an additional 2 available with each number.

Now, using both the facts, we can say that the product of 4 consecutive even numbers is always divisible by, =(24)×4!=(24)×4! =16×24=16×24 =384

1. Find the remainder when 1234567891011.............9989991000 is divided by 9?

A. 8

B. 7

C. 1

D. 6

Solution (C)

Till 999 each of the digits from 1 to 9 occurs equal number of times.

Total digit of all the numbers from 1 to 999 will be multiple of ∑9=45.

∑9=45.

Hence, S=45k+(1+0+0+0)S=45k+(1+0+0+0)  
⇒ Required remainder = 1.

33) What is the least perfect square divisible by 8, 9 and 10?

A) 4000

B) 6400

C) 3600

D) 14641

Ans: c

Solution: LCM (8, 9, 10) = LCM (23, 32, 2 × 5) = 23 × 32 × 5 = 360. To make it a perfect square, we need to multiply it by 2 5. So, the required least perfect square = 3600.

34) 4*a*56 is a four-digit numeral divisible by 33. What is the value of *a*?

A) 3

B) 4

C) 5

D) 6

Ans: a)

Solution 4*a*56 is divisible by 3 and 11. For divisibility by 3, 4 + *a* + 5 + 6 = 15 + *a* should be a multiple of 3. So, *a* = 3, 6 or 9. For divisibility by 11, S1 – S2 = (6 + *a*) – (4 + 5) = multiple of 11 or zero. Therefore, *a* = 3.

35) The sum of five distinct whole numbers is 337. If 60 is the smallest of them, what is the maximum value the largest number can have?

A] 91

B] 70

C] 97

D] 274

Ans: a

Solution Since the smallest number is 60, we will take the least values possible for 3 other numbers, i.e., 61, 62 and 63. Therefore, the largest number will be = 337 – (60 + 61 + 62 + 63) = 337 – 246 = 91.

36) Let *X* = 4851 \* 689 \* 5481, what is the remainder when *X* is divided by 13?

A] 2

B] 0

C] 1

D] 4

Ans: b

Solution: Since 689 is divisible by 13, remainder = 0.

37) Find the remainder when 64(1295)592 is divided by 13.

A] 11

B] 0

C] 12

D] 1

Solution [C] Remainder when 1295 is divided by 13 is 8.

Therefore remainder = (–1) x 8592 = (–1) x 64296 => (–1) x (–1)296 = –1 + 13 = 12.

39) For how many values of *n* are *n* – 8, *n, n* + 12 all prime numbers between 1 and 70?

A] 3

B] 4

C] 6

D] none of these

Ans: a

Solution For *n* = 11, we get 3, 11 and 23 which are prime. For *n* = 19, we get 11, 19 and 31 which are prime. For *n* = 31, we get 23, 31 and 43 which are prime. There are 3 possible values of *n*.

40) The product of HCF and LCM of two distinct natural numbers is equal to 23. In another set of two numbers HCF = LCM. However, none of the second set of numbers is the square or cube of any natural number. Which among the following is the sum of the product of numbers in the first set and the sum of the two numbers in the second set?

A] 31

B] 29

C] 25

D] 39

Ans: b)

Solution HCF × LCM of two distinct numbers is equal to 23. Hence, one of the numbers is 23 and another is 1. Product = 23 × 1 = 23 in the first set. In the second set, as HCF = LCM, the two numbers are equal. Hence the sum of two numbers is twice the number itself. Also, the number should not be a square or a cube. Now, use options. In [A], 31 – 23 = 8 = 2 × 4, where 4 is a perfect square. In [B], 29 – 23 = 6 = 2 × 3, where 3 is neither a perfect square nor a perfect cube.

41) Two numbers when divided by a certain divisor give remainder 16 and 12 respectively. When their sum is divided by the same divisor, the remainder is 4. Find the Divisor

A] 20

B] 24

C] 28

D] None of these

Ans: [B]

Solution: Divisor = 16+12 -4=24

42) A number when divided by 10 and 11 successively leaves the remainder 5 and 7 respectively. Find the remainder when the same number is divided by 110.

A] 75

B] 72

C] 70

D] None of these

Ans: [A]

Solution: Remainder = 10 X 7 + 5 = 75

43) Given that *x* is any even number greater than 2, *x*17 – *x* is a multiple of

A] 11

B] 13

C] 60

D] None of these

Ans. [C]

Solution: *x*17 – *x* = *x*(*x*16 – 1) = *x*(*x*8 – 1) (*x*8 + 1) = *x*(*x*4 – 1)(*x*4 + 1)(*x*8 + 1). Continuing this way, we would arrive at a term *x*(*x*2 – 1). Now, *x*(*x*2 – 1) = (*x* – 1)*x*(*x* + 1). Thus, these are 3 consecutive numbers and since *x* is an even number greater than 2, they have to be multiples of 3, 4 and 5. Thus, the given number is definitely a multiple of 3 × 4 × 5 = 60.

45) Which one of the following is 7th digit from the left in (203)3?

A] 3

B] 9

C] 7

D] None of these

Ans [C]

Solution: Number of digits in 2033 = 7.Therefore, question effectively means the unit’s place digit of 2033 which is 7.

1. A number n when divided by 23 leaves remainder 17? what is the remainder when n2+15 is divided by 23?
2. 5
3. 17
4. 15
5. None

Ans: a

Solution: Let n be 23k + 17. Therefore (n2+15) = (23k ) 2 + 2 x 23k x 17 + 17 2 + 15 when divided by 23 then first two terms gives remainder 0. When 17 2 + 15 is divided by 23 then remainder will be 5.

1. There N stations on a railroad. After adding x stations, 46 additional tickets have to be printed. Find x.
   1. 6
   2. 4
   3. 2
   4. Can’t be determined

Ans: c

**Exp:**  let N (N - 1) = t and (N + x) (N + x - 1) = t+46;

N (N – 1) + 2Nx + x2 – x = t + 46

2N = (46/x) + 1 – x, now x can be 2 or 23,

By putting x=2 we get N=11

While if x=23 gives the negative values of N which is absurd.

1. Amol calculates the sum of the first n natural numbers (1 + 2 + 3 + . . . .) till he feels tired. Then he reports the sum to the teacher as 610. The teacher replied that the sum was wrong as Amol had missed a number. The number that Amol missed was
2. 10
3. Less than 10
4. 20
5. Greater than 20

Ans: c

Solution: Σ35 = 630. So he missed 20.

1. Three gold coins of weight 780gm, 840gm and 960gm are cut into small pieces, all of which have the equal weight. Each piece must be heavy as possible. If one such piece is shared by two persons, then how many persons are needed to give all the pieces of gold coins?

A.86

B.70

C.43

D.35

Solution:

Option(A) is correct.

HCF(780,840,960)=60HCF(780,840,960)=60

Thus, total number of pieces:

⇒78060+84060+96060=13+14+16=43⇒78060+84060+96060=13+14+16=43

Total number of person required =43×2==43×2= 86.

50). Which one of the following statements is true?

A] 5400 > 4500

B] 5400 < 4500

C] 5400 = 4500

D] Can’t say

Ans. [B]

Solution: 5400 = (54)100 = 625100

4500 = (45)100 = 1024100

1024100 > 625100 ⇒ 4500 > 5400

51). The positive number X69955385Y is divisible by 88, where X and Y are single digit numbers. What are the values of X and Y respectively?

A] 1, 6

B] 6, 1

C] 3, 5

D] 5, 3

Ans. [A]

Solution: A number is divisible by 88 if the number if divisible by 8 as well as by 11. For 8, look at the last three digits of that number, which is 85Y. The only number between 850 and 859 divisible by 8 is 856. Hence, Y = 6. Applying the divisibility rule of 11, we get (6 + 9 + 5 + 8 + 6) – (*X* + 9 + 5 + 3 + 5) = 12 – *X*, which will be divisible by 11 when X = 1.

52) A Physical Trainer wants to arrange his students in different rows with equal number of students in each row. The number of students in a row is equal to the total number of rows. The number of students is 2436. How many more students are needed so that not a single student would be left outside this arrangement?

A] 0

B] 35

C] 64

D] None of these

Ans. [C]

Solution 2500 is a perfect square which is close to 2436. Now, 2436 = 2500 – 64 = 502 – 64. Hence, 64 students are required.

53) Find the smallest value of *n* for which 352*n*and 353*n*, when divided by 9, leave the same remainder.

A] 3

B] 5

C] 6

D] None of these

Ans [C]

Solution: Remainders when 352 and 353 are divided by 9 are 1 and 2 respectively. Hence, when 352*n* and 353*n* are divided by 9, the remainders are 1*n* and 2*n*.

Now, we need *n* such that 2*n* – 1*n* is a multiple of 9. Hence, *n* = 6.

54). Find the remainder when 9271 is divided by 7.

A] 1

B] 2

C] 3

D] 6

Ans. [B]

Solution: 9 when divided by 7 leaves a remainder of 2. Hence, 9271 when divided by 7 leaves a remainder of 2271.

Now, 2271 = 2270 × 21 = 890 × 21

When 8 is divided by 7, remainder = 1.

Therefore, when 890 is divided by 7, the remainder would be 190 = 1. Hence, the remainder when 890 × 21 is divided by 7, is 1 × 2 = 2.

55). Find the value of *a* and *b* when .

A] 4, 3

B] 4, –3

C] 

D] 

Ans. [D]

Solution =  = =  =  = 

= Hence, *a* =, *b* = 

56) In an examination, a student was asked to find  of a given number. By mistake, he found  of the number, which is 26 less than the correct answer. Find the given number.

A] 108

B] 

C] 

D] None of these

Ans [C]

Solution Let the number be *x*.

 = 26  = 26

 = 26 = 

57) 17 *n* – 1 is

A] always divisible by 8

B] always divisible by 18

C] is never divisible by 17

D] Both [A] and [C] are true

Ans [D]

Solution 17*n* – 1 is divisible by 16, whether *n* is even or odd. 17*n* – 1 is divisible by 18 when *n* is even and obviously it is never divisible by 17. Hence [D] is the correct answer.

58) When 242 is divided by a certain divisor the remainder obtained is 8. When 698 is divided by the same divisor the remainder obtained is 9. When the sum of the two numbers 242 and 698 is divided by the divisor, the remainder obtained is 4. What is the value of the divisor?

1. 11
2. 17
3. 13
4. 23
5. None of these

Ans. c)

Solution. When 242 is divided by a certain divisor the remainder obtained is 8. Let the divisor be d.

When 242 is divided by d, let the quotient be 'x'. The remainder is 8. Therefore, 242 = xd + 8

When 698 is divided by the same divisor the remainder obtained is 9. Let y be the quotient when 698 is divided by d. Then, 698 = yd + 9.

When the sum of the two numbers, 242 and 698, is divided by the divisor, the remainder obtained is 4.

242 + 698 = 940 = xd + yd + 8 + 9

940 = xd + yd + 17

As xd and yd are divisible by d, the remainder when 940 is divided by d should have been 17.

However, because we know that the remainder is 4, it would be possible only when 17d17d leaves a remainder of 4.

If the remainder obtained is 4 when 17 is divided by 'd', then 'd' has to be 13.

59) A trader has three kinds of liquids of first kind 117 lit, second kind 130 lit and the third kind 143lit. Find the least number of full casks of equal sizes which this can be stored without mixing them.

A] 28 B] 24 C] 36 D] 30

Ans : [D]

Solution: HCF (117,130,143)=13. So number of casks required is 9 + 10+11=30

60) 64 mango trees, 48 apple trees and 80 orange trees have to plant in rows such that each row contains the same number of trees of one variety only. Find the least number of rows in which the trees may be planted.

A] 18 B] 12 C] 16 D] 24

Ans: [B]

Solution: HCF (64, 48, 80) = 16. Number of rows required = 4+3+5=12

61) Find the least number of square tiles required to pave the floor of a room of 8m 99cm long and 6m 67cm broad.

A] 713 B] 723 C] 717 D] 719

Ans: [A]

Solution: HCF(899, 667) = 29

Required number of tiles = Area of floor/Area of tile

= (899\*667/29\*29) = 31\*23 = 713