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Number System

Basics of Number System

(1) Face Value :- It is nothing but the number itself about which it has been asked.
i.e. In the number 23576, face value of 5 is 5 and face value of 7 is 7.

(2) Place Value :- The place value of a number depends on its position in the number. Each position has a value 10^n, the places to its right.
i.e. In the number 23576, place value of 5 is 500 and place value of 3 is 3000.

Types of Numbers

(1) Natural Numbers (N) :- All positive counting numbers. (0 is not included in it.)
i.e. 1, 2, 3, 4 ... etc.

(2) Whole Numbers (W) :- All non - negative numbers are all whole numbers.
i.e. 0, 1, 2, 3, 4... etc.

(3) Integer Numbers (I) :- All positive numbers and negative numbers including zero. Positive numbers are called positive integers and negative numbers are called negative integers.
I = ... , -4, - 3, - 2, - 1, 0, 1, 2, 3, 4 .....

(4) Even Numbers :- 2, 4, 6, 8, 10..... [Divisible by 2 completely]

(5) Odd Numbers :- 1, 3, 5, 7, 9, 11..... [Not divisible by 2 completely]

(6) Rational Numbers :- Numbers whose exact value can be determined.
i.e. $\frac{3}{4}$ = 0.75, $\frac{4}{5}$ = 0.8

(7) Irrational Numbers :- Numbers whose exact value cannot be determined.
i.e. $\frac{22}{7}$ = 3.142857142857 ...

(8) Prime number :- A number which is divisible by 1 and itself. 2 is only an even prime number.
i.e. 2, 3, 5, 7, 11, etc.

Note:-
Total prime no. between 1 - 50 ⇒ 15
Total prime no. between 1 - 100 ⇒ 25
Total prime no. between 1 - 500 ⇒ 95
Total prime no. between 1 - 1000 ⇒ 168

(9) Composite number :- If we remove all prime numbers from natural numbers then whatever is left is called Composite numbers.
i.e. 4, 6, 8, 9, 10, 12 etc.
Note :- 1 is neither prime nor composite.

(10) Co - prime number :- Two numbers are called Co-prime numbers if their HCF is 1.
i.e. (2 and 3), (6 and 11).
Note : Two prime numbers are always co-prime numbers to each other. Any two consecutive integers are always co-prime number to each other.

Factors

The factors of a number are the numbers that divide it completely without leaving any remainder.

i.e. 24 can be completely divided by 1, 2, 3, 4, 6, 8, 12 and 24, so these numbers are factors of 24.

Prime factorisation of a number :- When a number is written in the form of multiplication of its prime factors, it's called prime factorisation.
i.e. Prime factorisation of 24.

2	24
2	12
2	6
	3

24 → 2 × 2 × 2 × 3 or $2^3 \times 3^1$

Number of factors :- To find the number of factors we write the number in the form of prime factors and then add +1 to the exponent of prime factors and multiply them.
i.e. 24 = $2^3 \times 3^1$
Number of factors of 24 → (3 + 1)(1 + 1) = 4 × 2 = 8.
With the help of an example, we try to find the sum of all factors of a number.
24 = $2^3 \times 3^1$,
Sum of all factors = $(2^0 + 2^1 + 2^2 + 2^3) \times (3^0 + 3^1)$ = 15 × 4 = 60.

Number of even factors of a number :- To find the number of even factors of a number, we add +1 to the exponents of prime numbers except 2.
(Note : If a number doesn't have 2 as its factor it will have 0 even factors)

Example :- Find the number of even factors of 120.
Solution :- 120 = $2^3 \times 3^1 \times 5^1$
Number of even factors
= 3 × (1 + 1) × (1 + 1) = 3 × 2 × 2 = 12

Note :- To find the sum of even factors, we shall ignore 2^0,

Example :- Find the sum of even factor of 120.

Solution :- Sum of even factors = $(2^1 + 2^2 + 2^3)(3^0 + 3^1)(5^0 + 5^1)$ = 14 × 4 × 6 = 336.

Number and Sum of odd factors of a number : to find the number and sum of odd factors of a number, we have to ignore the exponents of 2.

Example :- Find the number of odd factors 120.

Solution :- 120 = $2^3 \times 3^1 \times 5^1$
Required number = (1 + 1)(1 + 1) = 4
The exponent of 2 is completely ignored.
Sum of odd factors of 120 = $(3^0 + 3^1)(5^0 + 5^1)$ = 4 × 6 = 24

Some Important Results of Factors :
1001 = 7 × 11 × 13
1001 × abc = abcabc
1001 × 234 = 234234

Example :- Which of the following is a factor of 531531?
(a) 15 (b) 13 (c) 11 (d) both b and c
Solution :- 531531 = 1001 × 531
= 7 × 11 × 13 × 531 So, both 11 and 13 are factors of 531531.
111 = 37 × 3 , 1001 × 111 = 111111,
When a single digit is written 6 times, 3, 7, 11, 13, and 37 are factors of it.

Example :- Which of the following is a factor of 222222 ?
(a) 17 (b) 57 (c) 68 (d) 74
Solution :- 222222 = 2 × 111111
= 2 × 3 × 7 × 11 × 13 × 37
Clearly, 2 × 37 = 74 is one of the factors.

Recurring Decimal

Recurring decimals are referred to as numbers that are uniformly repeated after the decimal. Some rational numbers produce recurring decimals after converting them into decimal numbers, but all irrational numbers produce recurring decimals after converting them into decimal form.
i.e.
(1) $\frac{1}{3}$ = 0.3333333 ..... = $0.\overline{3}$

(2) $0.\overline{9} = \frac{9}{9} = 1$

(3) $0.5\overline{327} = \frac{5327-53}{9900} = \frac{5274}{9900}$

(4) $2.5\overline{327} = 2 + \frac{5327-53}{9900} = 2\frac{5274}{9900}$

Divisibility Test

By 2:- When the last digit is 0 or an even number. **i.e.** 520, 588

By 3:- Sum of digits is divisible by 3
i.e. 1971, 1974

By 4:- When last two digits are divisible by 4 or, they are zeros **i.e.** 1528, 1700

By 5 :- When last digit is 0 or 5
i.e. 1725, 1790

By 6 :- When the number is divisible by 2 and 3 both. **i.e.** 36, 72

By 7 : - Subtract twice the last digit from the number formed by the remaining digits.
i.e. 651 divisible by 7
65 - (1 × 2) = 63. Since 63 is divisible by 7, so is 651.

By 8 :- When the last three digits are divisible by 8. **i.e.** 2256

By 9 :- When sum of digit is divisible by 9
i.e. 9216

By 10 :- When the last digit is 0. **i.e.** 452600

By 11:- When the difference between the sum of odd and even place digits is equal to 0 or multiple of 11 .
i.e. 217382
Sum of odd place digits = 2 + 7 + 8 = 17
Sum of even place digits = 1 + 3 + 2 = 6
17 – 6 = 11, hence 217382 is divisible by 11.

By 13 : - If adding four times the last digit to the number formed by the remaining digits is divisible by 13, then the number is divisible by 13.
i.e. 1326 is divisible by 13
132 + (6 × 4) = 156. Repeat the same process for 156 .
15 + (6 × 4) = 39.so 39 is divisible by 13

BY 17 :-The divisibility rule of 17 states, "If five times the last digit is subtracted from a number made up of the remaining digits and the remainder is either 0 or a multiple of 17, then the number is divisible by 17".
i.e. 221: 22 − 1 × 5 = 17.

Prime Number Test

For finding whether any number is a prime number or not, we need to find the nearest square root of given number, then we need to find out whether the given number is divisible by any prime number less than the obtained number or not. If it is divisible then it is not a prime number and if not divisible then it is a prime number.

Example :- Find whether 177 is a prime number or not.

Solution :- Nearest square root of 177 is 13. Now we need to check whether 177 is divisible by prime numbers less than 13. On checking we find that 177 is divisible by 3. Hence, 177 is not a prime number.

Important Formulas

1. Sum of first n natural number
s = $\frac{n(n+1)}{2}$

2. Sum of first n odd numbers = n^2

3. Sum of first n even numbers
= $n(n+1)$

4. Sum of square of first n natural numbers = $\frac{n(n+1)(2n+1)}{6}$

5. Sum of cubes of first n natural number = $(\frac{n(n+1)}{2})^2$

6. $(x^m - a^m)$ is divisible by $(x-a)$ for every natural number m.

7. $(x^m - a^m)$ is divisible by $(x+a)$ and $(x-a)$ for even values of m.

8. $(x^m + a^m)$ is divisible by $(x+a)$ for odd values of m.

9. Number of prime factors of a^p, b^q, c^r, d^s is $p+q+r+s$ when a, b, c, d are all prime numbers.

10. HCF of $(a^m - 1)$ and $(a^n - 1)$ = $[(a^{HCF(m,n)} - 1)]$

Number of Zeros in an expression

We shall understand this concept with the help of an example.
Let's find the number of zeros in the following expression: 24 × 32 × 17 × 23 × 19 = $(2^3 \times 3^1) \times 2^5 \times 17 \times 23 \times 19$
Notice that a zero is made only when there is a combination of 2 and 5. Since there is no '5' here there will be no zero in the above expression.
i.e. $8 \times 15 \times 23 \times 17 \times 25 \times 22 = 2^3 \times (3^1 \times 5^1) \times 23 \times 17 \times 5^2 \times 2^1 \times 11$
In this expression there are 4 twos and 3 fives. From this 3 pairs of 5×2 can be formed. Therefore, there will be 3 zeros in the final product.

Example:- Find the number of zeros in the value of:
$2^2 \times 5^4 \times 4^6 \times 10^8 \times 6^{10} \times 15^{12} \times 8^{14} \times 20^{16} \times 10^{18} \times 25^{20}$.

Solution :- $2^2 \times 5^4 \times 4^6 \times 10^8 \times 6^{10} \times 15^{12} \times 8^{14} \times 20^{16} \times 10^{18} \times 25^{20}$
$= 2^2 \times 5^4 \times 2^{12} \times 2^8 \times 5^8 \times 2^{10} \times 3^{10} \times 3^{12} \times 5^{12} \times 2^{42} \times 2^{32} \times 5^{16} \times 2^{18} \times 5^{18} \times 5^{40}$
Zeros are possible with a combination of 2×5 Here the number of 5's are less so the number of zeros will be limited to the number of 5's.
In this expression number of fives are:
$5^4 \times 5^8 \times 5^{12} \times 5^{16} \times 5^{18} \times 5^{40}$;
i.e. 4 + 8 + 12 + 16 + 18 + 40 = 98

The number of Zeros in n!

To find the number of zeros in n!, we divide "n" by 5 until we get a number less than 5, and then we add all the quotients so obtained.
i.e. Find the number of zeros in 36!.

5	36	
5	7	(1)
	1	(2)

The number of zeros = 7 + 1 = 8.

Remainder Theorem

Some Important Results

1. Let us assume that when $a_1, a_2, a_3, \ldots, a_n$ are individually divided by d, the respective remainders are $r_1, r_2, r_3, \ldots, r_n$. Now, if we divide $(a_1 + a_2 + a_3 + \ldots + a_n)$ by d, we get the same remainder as when we get by dividing $(r_1 + r_2 + r_3 + \ldots + r_n)$ by d.

Example :- Find the remainder when 55 + 45 + 68 is divided by 16.

Solution :- When we divide 55, 45 and 68 by 16 we obtain the respective remainders as 7, 13 and 4. Now we can obtain the required remainder by

dividing the sum of remainders (i.e.,7 + 13 + 4 = 24) by 16, which is 8 instead of dividing the sum of actual given numbers (i.e., 55 + 45 + **68 = 168) by 16, which also gives us the same remainder 8.**

2. When $a_1, a_2, a_3, ..., a_n$ are divided by a divisor d the respective remainders obtained are $r_1, r_2, r_3, ..., r_n$ then the remainder when $(a_1 \times a_2 \times a_3 \times ... \times a_n)$ is divided by 'd' can be obtained by dividing $(r_1 \times r_2 \times r_3 \times ... \times r_n)$ by d.

Example :- What will be the remainder when 201 × 198 × 80 is divided by 35 ?

Solution:- when 201 × 198 × 80 is divided by 35 the remainders can be obtained by dividing the product of the remainders which are obtained by dividing 201, 198, 80 individually. Now since the remainders are 26, 23, 10 so the required remainder = Remainder of (26×23×10) when divided by 35.

Thus the required remainder = $\frac{26 \times 23 \times 10}{35} = \frac{26 \times 230}{35} = \frac{26 \times 20}{35}$

Thus 30 is the remainder.

Example :- What will be the remainder when 17×23 is divided by 12?

Solution :- We can express this as:

$17 \times 23 = (12 + 5) \times (12 + 11)$

$= 12 \times 12 + 12 \times 11 + 5 \times 12 + 5 \times$

In the above expression we will find that remainder will depend on the last term i.e. 5×11

Now, $rem.(\frac{5 \times 11}{12}) = 7$.

So,

$\frac{12 \times 12 + 12 \times 11 + 5 \times 12 + 5 \times 11}{12}$

and $\frac{5 \times 11}{12}$ remainder is same in both cases which is 7.

Negative Remainder

Taking a negative remainder will make our calculation easier.

Examples :

(i) $rem\ (\frac{7 \times 8}{9}) = rem\ (\frac{-2 \times -1}{9})$

$= -2 \times -1 = 2$

(ii) $rem\ (\frac{55 \times 56}{57}) = rem\ (\frac{-2 \times -1}{57})$

$= -2 \times -1 = 2$

(iii) $rem\ (\frac{7 \times 10}{9}) = rem(\frac{-2 \times 1}{9})$

$= -2 \times 1 = -2\ or,\ 7$

Large Power Concepts

Look at the following examples:

(i) rem $(\frac{28^{12345}}{9}) = rem(\frac{(27+1)^{12345}}{9})$

= rem $(\frac{1^{12345}}{9}) = 1^{12345} = 1$

(ii) rem $(\frac{26^{12345}}{9}) = rem\ (\frac{(27-1)^{12345}}{9})$

= rem $(\frac{-1^{12345}}{9}) = -1^{12345} = -1$ or 8

Application of Remainder Theorem

Example :- Find the last two digits of the expression?

$22 \times 31 \times 44 \times 27 \times 37 \times 43$?

Solution :- If we divide the above expression by 100, we will get the last two digits as remainder.

$\Rightarrow rem(\frac{22 \times 31 \times 44 \times 27 \times 37 \times 43}{100})$,

dividing by 4 to make it simple

$= rem(\frac{22 \times 31 \times 11 \times 27 \times 37 \times 43}{25})$

$= rem(\frac{132 \times 22 \times 216}{25})$

$= rem(\frac{7 \times 22 \times 16}{25}) \Rightarrow rem(\frac{4 \times 16}{25})$

$= rem(\frac{14}{25}) = 14$

Since we had divided by 4 initially now to get the correct answer, we need to multiply the remainder by 4.

So remainder will be $14 \times 4 = 56$, which will also be the last two digits of the expression.

Variety Questions

Q.1. Find the smallest number to be added to 1000 so that 55 divides the sum exactly.
SSC CHSL 10/08/2023 (3rd Shift)
(a) 25 (b) 45 (c) 35 (d) 10

Q.2. The divisor is 10 times the quotient and 5 times the remainder in a division sum. What is the dividend if the remainder is 46 ?
SSC CHSL 03/08/2023 (2nd Shift)
(a) 5972 (b) 4286 (c) 4874 (d) 5336

Q.3. Which of the following numbers is NOT divisible by 11?
SSC CHSL 02/08/2023 (1st Shift)
(a) 1735624 (b) 752563
(c) 1661308 (d) 1904529

Q.4. What is the remainder when $(x^{17} + 1)$ is divided by (x + 1) ?
SSC CGL 25/07/2023 (3rd shift)
(a) x (b) x – 1 (c) 0 (d) 1

Q.5. When m is divided by 7, the remainder is 5. When 3m is divided by 7, the remainder is:
SSC CGL 19/07/2023 (4th shift)
(a) 3 (b) 2 (c) 1 (d) 0

Q.6. While solving a problem, Suhas by mistake took a number as dividend which was 10% less than the original dividend. He also mistakenly took a number as the quotient which was 20% less than the original quotient. If the correct quotient of the original question of division was 24 and the remainder was 0, then assuming that there was no error in his calculation, what was the quotient obtained by Suhas ?
SSC CGL 19/07/2023 (1st shift)
(a) 27 (b) 21.6 (c) 26.4 (d) 30

Q.7. Find the smallest number that can be subtracted from 148109326 so that it becomes divisible by 8.
SSC CGL 17/07/2023 (1st shift)
(a) 4 (b) 8 (c) 6 (d) 10

Q.8. Which of the following numbers will completely divide $(6^{61} + 6^{62} + 6^{63} + 6^{64})$?
Selection Post 30/06/2023 (2nd Shift)
(a) 10 (b) 13 (c) 7 (d) 11

Q.9. What is the least value of * so that the number 457643*4 is divisible by 18?
Selection Post 28/06/2023 (2nd Shift)
(a) 9 (b) 3 (c) 4 (d) 5

Q.10. Consider the following in respect of prime number p and composite number c.
1. $\frac{p+c}{p-c}$ can be even.
2. 2p + c can be odd.
3. pc can be odd.
Which of the statements given above are correct?
UPSC CSAT (28/05/2023)
(a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3

Q.11. What is the largest power of 10 that divides the product 29 × 28 × 27 ×...2 × 1 ?
UPSC CDS - I (16/04/2023)
(a) 4 (b) 5 (c) 6 (d) 7

Q.12. Consider a 6-digit number of the form XYXYXY. The number is divisible by:
UPSC CDS - I (16/04/2023)
(a) 3 and 7 only (b) 7 and 13 only
(c) 3, 13 and 37 only (d) 3, 7, 13 and 37

Q.13. Which of the following is largest among $(125)^{\frac{1}{6}}, (11)^{\frac{1}{3}}, (12)^{\frac{1}{6}}, (5)^{\frac{1}{4}}$?

SSC CHSL 21/03/2023 (3rd Shift)
(a) $(12)^{\frac{1}{6}}$ (b) $(11)^{\frac{1}{3}}$ (c) $(125)^{\frac{1}{6}}$ (d) $(5)^{\frac{1}{4}}$

Q.14. If the sum of a number and its reciprocal is 4, find the sum of their squares,
SSC CHSL 17/03/2023 (2nd Shift)
(a) 12 (b) 16 (c) 14 (d) 18

Q.15. What is the total number of factors of the number 840 except 1 and the number itself ?
SSC CHSL 15/03/2023 (2nd Shift)
(a) 29 (b) 30 (c) 28 (d) 31

Q.16. What are the last three digit of the multiplication 654321 × 123456 ?
SSC CHSL 14/03/2023 (4th Shift)
(a) 376 (b) 344 (c) 324 (d) 352

Q.17. How many prime numbers are there between 20 and 50?
SSC CHSL 10/03/2023 (2nd Shift)
(a) 8 (b) 5 (c) 6 (d) 7

Q.18. The sum of three consecutive even numbers is 126. What is the product of the smallest and the largest numbers ?
SSC CHSL 10/03/2023 (3rd Shift)
(a) 1840 (b) 1950 (c) 1760 (d) 1620

Q.19. The number 2918245 is divisible by which of the following numbers?
SSC CGL Tier II (03/03/2023)
(a) 3 (b) 11 (c) 12 (d) 9

Q.20. Any six - digit number that is formed by repeating a three - digit number, is always divisible by:
SSC CGL 12/12/2022 (2nd Shift)
(a) 111 (b) 1001 (c) 19 (d) 101

Q.21. Which of the following pairs of non-zero values of p and q make 6 - digit number 674pq0 divisible by both 3 and 11 ?
SSC CGL 05/12/2022 (1st Shift)
(a) p = 2 and q = 2 (b) p = 5 and q = 4
(c) p = 4 and q = 2 (d) p = 5 and q = 2

Q.22. Ramu had to select a list of numbers between 1 and 1000 (including both), which are divisible by both 2 and 7. How many such numbers are there?
SSC CPO 11/11/2022 (Morning)
(a) 142 (b) 71 (c) 97 (d) 642

Q.23. A six - digit number 763254 is divisible by 18. If we subtract five times of 41 from the number, then the new number which is formed will be divisible by:
SSC CPO 11/11/2022 (Afternoon)
(a) 2 (b) 7 (c) 5 (d) 3

Q.24. In a test (+ 5) marks are given for every correct answer and (−2) marks are given for every incorrect answer. Jay answered all the questions and scored (−12) marks, though he got 4 correct answers. How many of his answers were INCORRECT ?
SSC CPO 11/11/2022 (Evening)
(a) 8 (b) 32 (c) 16 (d) 20

Q.25. Among the following statements, the statement which is not correct is :
IBPS PO Pre 15/10/2022 (2nd Shift)
(a) Every natural number is an integer.
(b) Every natural number is a real number.
(c) Every real number is a rational number.
(d) Every integer is a rational number.
(e) None of these

Q.26. The average of the first 7 multiples of 3 is:
RRC Group D 29/09/2022 (Morning)
(a) 11.3 (b) 12 (c) 10.5 (d) 12.5

Q.27. Out of six consecutive natural numbers, if the sum of the first three is 27, what is the sum of the other three?
RRB Clerk Mains (24/09/2022)
(a) 24 (b) 25 (c) 35 (d) 36
(e) None of these

Q.28. If 1 is added to the first digits and 1 is subtracted from the last digits of each of the following numbers, then in how many numbers will the first digit be exactly divisible by the last digit ?
242 , 657 , 864 , 264 , 674 , 218 , 845
RRC Group D 14/09/2022 (Morning)
(a) 2 (b) 1 (c) 3 (d) 0

Q.29. The number 3.121212121212 ..... is an example of
CUET PG 12/09/2022 (3rd shift)
(a) Recurring decimal number
(b) Non Recurring decimal number
(c) Decimal fraction
(d) Terminating decimal number

Q.30. The sum of a two - digit number and the number obtained by reversing the digits is 99. If the digits of the number differ by 5, then the two-digit number can be:
RRC Group D 01/09/2022 (Morning)
(a) 27 (b) 16 (c) 83 (d) 18

Q.31. Find the sum of the prime factors of $9^6 \times 12^4 \times 7^7$?
RRC Group D 26/08/2022 (Evening)
(a) 13 (b) 12 (c) 14 (d) 11

Q.32. There are two consecutive natural numbers such that the sum of their squares is 313. Find the smaller of these two numbers.
RRC Group D 24/08/2022 (Morning)
(a) 12 (b) 13 (c) 14 (d) 15

Q.33. How many numbers are there from 400 to 700 in which the digit 6 occurs exactly twice?
SSC CGL Tier II (08/08/2022)
(a) 19 (b) 18 (c) 21 (d) 20

Q.34. Ishita can read a newspaper in 'n' minutes. What part of the newspaper can she read in 7 minutes? (n > 7)
SSC MTS 12/07/2022 (Morning)
(a) $\frac{n}{7}$ (b) $7n^2$ (c) 7n (d) $\frac{7}{n}$

Q.35. In a bag full of pencils , $\frac{3}{4}$ of the pencils were coloured pencils , and $\frac{8}{15}$ of the coloured pencils were red. If there were 40 red pencils in the bag. What was the total numbers of pencils in the bag ?
NTPC CBT II (15/06/2022) 1st Shift
(a) 100 (b) 120 (c) 150 (d) 180

Q.36. Which of the following can be a rationalizing factor of $(\sqrt{2}+\sqrt{3}+\sqrt{5})$?
SSC CHSL 27/05/2022 (Afternoon)
(a) $(\sqrt{2}-\sqrt{3}-\sqrt{5})\sqrt{6}$
(b) $(\sqrt{2}+\sqrt{3}-\sqrt{5})\sqrt{6}$
(c) $(\sqrt{2}-\sqrt{3}+\sqrt{5})\sqrt{6}$
(d) $(\sqrt{2}+\sqrt{3}+\sqrt{5})\sqrt{6}$

Q.37. One - seventh of a 2 - digit number is 15 less than half of the number. What is the sum of the digits of the 2 - digit number ?
Level 6 (09/05/2022) Shift 1
(a) 8 (b) 5 (c) 7 (d) 6

Q.38. If the numbers from 1 to 24, which are divisible by 2 are arranged in ascending order, which number will be at the 6th place from the bottom?
SBI PO Pre 21/11/2021 (3rd Shift)
(a) 18 (b) 16 (c) 14 (d) 10
(e) None of these

Q.39. The difference between two numbers is 45. When 20% of the larger number is added to 35% of the smaller number, we get a sum of 31. What is the sum of the original numbers?
RRB NTPC CBT - I 26/07/2021 (Morning)
(a) 125 (b) 115 (c) 135 (d) 131

Q.40. The difference between the denominator and the numerator of a fraction is 3. If the denominator as well as the numerator is increased by 4, then fraction becomes $\frac{4}{5}$. Find the original fraction.
MPPSC CSAT (25/07/2021)
(a) $\frac{7}{10}$ (b) $\frac{5}{8}$ (c) $\frac{8}{11}$ (d) $\frac{10}{13}$

Q.41. The sum of the square of the first ten natural numbers is:
RRB NTPC CBT - I 05/04/2021 (Morning)
(a) 3025 (b) 5050 (c) 385 (d) 55

Q.42. Kunal was asked to find $\frac{5}{6}$ times of a number. He multiplied it by $\frac{6}{5}$, As a result, he got an answer which was more than the correct answer by 572. The number was:
RRB NTPC CBT - I 21/03/2021 (Evening)
(a) 2860 (b) 5720 (c) 1560 (d) 2160

Q.43. The numerator of a fraction is less than its denominator by 2. If we subtract 2 from the numerator and add 2 to the denominator, then the new fraction is $\frac{1}{3}$. What is the original fraction?
RRB NTPC CBT - I 01/03/2021 (Morning)
(a) $\frac{1}{3}$ (b) $\frac{3}{7}$ (c) $\frac{5}{9}$ (d) $\frac{5}{7}$

Q.44. A pillar is divided into three parts. The first part is $\frac{1}{4}$ of the whole, second part is $\frac{4}{8}$ of the first, and the third is 10 m. The length of the pillar is:
RRB NTPC CBT - I 01/03/2021 (Morning)
(a) 20 m (b) 18 m (c) 16 m (d) 22 m

Q.45. What is the smallest five - digit number formed by using the digits 2 , 3 , 4 , 0 , 5 ?
RRB NTPC CBT - I 04/02/2021 (Morning)
(a) 20345 (b) 23045 (c) 20435 (d) 02345

Q.46. The square root of 90 will lie between_____.
RRB NTPC CBT - I 31/01/2021 (Morning)
(a) 9 and 10 (b) 8 and 9
(c) 7 and 8 (d) 10 and 11

Q.47. What is the place value of 5 in the number 56789214 ?
RRB NTPC CBT - I 29/01/2021 (Evening)
(a) 5×10^5 (b) 5×10^7
(c) 5×10^6 (d) 5×10^4

Q.48. Instead of multiplying a number by 2, Rahul divided it by 2 and got the answer as 2. What should be the actual answer ?
RRB NTPC CBT - I 25/01/2021 (Morning)
(a) 6 (b) 4 (c) 8 (d) 2

Q.49. $\frac{(3\sqrt{5}+\sqrt{125})}{(\sqrt{80}+6\sqrt{5})}$ is..
RRB NTPC CBT - I 13/01/2021 (Morning)
(a) an irrational number
(b) a rational number
(c) an integer
(d) a natural number

Q.50. Decimal expansion of $\frac{109}{100}$ is:
RRB NTPC CBT - I 07/01/2021 (Evening)
(a) $1 + \frac{9}{10}$ (b) $10 + \frac{9}{100}$
(c) $1 + \frac{0}{10} + \frac{9}{100}$ (d) $100 + 9 + \frac{0}{100}$

Q.51. Number 0.232323 can be written in rational form as.
RRB NTPC CBT - I 30/12/2020 (Morning)
(a) $\frac{23}{99}$ (b) $\frac{23}{990}$ (c) $\frac{23}{999}$ (d) $\frac{23}{9}$

Q.52. Two positive numbers differ by 1280. When the greater number is divided by the smaller number, the quotient is 7 and the remainder is 50. The greater number is:
SSC CGL Tier II (15/11/2020)
(a) 1458 (b) 1485 (c) 1585 (d) 1558

Q.53. M and N are any two numbers between 0 and 9. Tell the minimum values of M and N respectively for which the number 23M5N is completely divisible by 12.
UPMRC JE 20/01/2020 (3rd shift)
(a) 0 and 0 (b) 2 and 2
(c) 0 and 2 (d) 2 and 0

Q.54. How many natural numbers less than 1000 are divisible by 5 or 7 but NOT by 35 ?
SSC CPO 11/12/2019 (Morning)
(a) 285 (b) 313 (c) 341 (d) 243

Q.55. A man ate 100 grapes in 5 days. Each day, he ate 6 more grapes than those he ate on the earlier day. How many grapes did he eat on the first day?
LIC Assistant Pre 31/10/2019 (1st Shift)
(a) 8 (b) 12 (c) 54 (d) 76
(e) None of these

Q.56. The number of factors of 3600 is :
SSC CGL Tier II (12/09/2019)
(a) 45 (b) 44 (c) 43 (d) 42

Q.57. A number when divided by 15 leaves the remainder 12. Another number when divided by 5 leaves the remainder 2. What is the remainder when their sum is divided by 5 ?
RRB JE 31/05/2019 (Afternoon)
(a) 3 (b) 1 (c) 2 (d) 4

Q.58. The remainder when a number $2851 \times (2862)^2 \times (2873)^3$ is divided by 23 is :
HCS CSAT (31/03/2019)
(a) 5 (b) 17 (c) 18 (d) 19

Q.59. Find the number of trailing zeros in 76 !
RPF S.I. 19/12/2018 (Morning)
(a) 18 (b) 16 (c) 20 (d) 14

Q.60. In how many ways can 480 mobiles be distributed equally to the students of a class?
RPF S.I. 19/12/2018 (Morning)
(a) 14 (b) 16 (c) 20 (d) 24

Q.61. What is the value of $99\frac{1}{2} + 99\frac{1}{6} + 99\frac{1}{12} + 99\frac{1}{20} + 99\frac{1}{30}$?
Delhi Police Cons. 08/12/2017 (Evening)
(a) $\frac{2975}{6}$ (b) $\frac{1995}{7}$ (c) $\frac{3925}{7}$ (d) $\frac{1649}{21}$

Easy Section

SSC Previous Year Questions

Q.62. The six - digit number N = 4a6b9c is divisible by 99, then the maximum sum of the digits of N is:
SSC CHSL 17/08/2023 (1st Shift)
(a) 18 (b) 36 (c) 45 (d) 27

Q.63. Which of the numbers amongst 25560, 35751, 48168, and 49608 is NOT divisible by 24 ?
SSC CHSL 14/08/2023 (4th Shift)
(a) 35751 (b) 48168 (c) 25560 (d) 49608

Q.64. The number 76050 is NOT divisible by which of the following numbers?
SSC CHSL 14/08/2023 (2nd Shift)
(a) 4 (b) 9 (c) 3 (d) 13

Q.65. Find the least value for * in the number 3*7440 such that it is divisible by 12.
SSC CHSL 11/08/2023 (1st Shift)
(a) 0 (b) 2 (c) 1 (d) 4

Q.66. What is the value of x in the number 3426x if the number is divisible by 6 but NOT divisible by 5 ?
SSC CHSL 10/08/2023 (4th Shift)
(a) 3 (b) 4 (c) 6 (d) 8

Q.67. What is the remainder when 3^8 is divided by 7 ?
SSC CHSL 08/08/2023 (2nd Shift)
(a) 5 (b) 4 (c) 6 (d) 2

Q.68. Which of the following sets is such that all its elements are divisors of the number 2520 ?
SSC CHSL 08/08/2023 (1st Shift)
(a) 12, 49, 18 (b) 8 , 9, 7
(c) 16, 15, 14 (d) 21, 10, 25

Q.69. What is the least number that must be added to the greatest 6-digit number so that the sum will be exactly divisible by 294 ?
SSC CHSL 07/08/2023 (2nd Shift)

(a) 234 (b) 194 (c) 269 (d) 189

Q.70. What is the least value of x for which the number 712x816 is divisible by 12 ?
SSC CHSL 04/08/2023 (4th Shift)
(a) 4 (b) 1 (c) 0 (d) 2

Q.71. What is the largest five digit number exactly divisible by 88 ?
SSC CHSL 04/08/2023 (1st Shift)
(a) 99992 (b) 99986 (c) 99984 (d) 99968

Q.72. A Number when divided by 78 gives the quotient 280 and the remainder 0. If the same number is divided by 65, what will be the value of the remainder ?
SSC CHSL 02/08/2023 (4th Shift)
(a) 1 (b) 3 (c) 0 (d) 2

Q.73. Which of the following is the nearest number to 13051 and is divisible by 9 ?
SSC CHSL 02/08/2023 (3rd Shift)
(a) 13057 (b) 13056 (c) 13059 (d) 13058

Q.74. Which of the following numbers is not divisible by 6.
I) 1,97,232 II) 9,72,132
III) 8,00,552 IV) 17,90,184
SSC CHSL 02/08/2023 (2nd Shift)
(a) (I) (b) (III) (c) (IV) (d) (II)

Q.75. Which number among 11368, 11638, 11863 and 12638 is divisible by 11 ?
SSC CGL 27/07/2023 (3rd shift)
(a) 11368 (b) 12638 (c) 11638 (d) 11863

Q.76. Which of the following numbers is divisible by 12 ?
Selection Post 30/06/2023 (4th Shift)
(a) 5409844 (b) 4298123
(c) 4512984 (d) 3215678

Q.77. In a division problem, the divisor is 12 times the quotient and 9 times the remainder. If the remainder is 96, then find the dividend.
Selection Post 27/06/2023 (2nd Shift)
(a) 62304 (b) 62404 (c) 62205 (d) 62208

Q.78. A number is divisible by 3 only when:
SSC CHSL Tier II (26/06/2023)
(a) the difference of the sum of the odd and the even digits is divisible by 3
(b) the sum of its digits is divisible by 3
(c) the last digit is either 0 or an even number
(d) the last two digits are divisible by 3

Q.79. How many composite numbers are there between 23 and 43 ?
SSC CHSL 14/03/2023 (1st Shift)
(a) 7 (b) 14 (c) 15 (d) 18

Q.80. A number when divided by 221, leaves a remainder 30. If the same number is divided by 13, the remainder will be:
SSC CGL 08/12/2022 (1st Shift)
(a) 4 (b) 3 (c) 2 (d) 1

Q.81. What will be the remainder when $27^{27} + 27$ is divided by 28
SSC CGL 01/12/2022 (3rd Shift)
(a) 28 (b) 27 (c) 25 (d) 26

Q.82. The number of factors of 196 which are divisible by 4 is:
SSC CPO 09/11/2022 (Afternoon)
(a) 228 (b) 4 (c) 57 (d) 3

Q.83. x, y and z are distinct prime numbers where x < y < z. If x + y + z = 70 , then what is the value of z ?
SSC CGL Tier II (08/08/2022)
(a) 29 (b) 43 (c) 31 (d) 37

Q.84. Which of the following is not a pair of co-prime numbers?
Graduate Level 01/08/2022 (Shift - 4)
(a) 22, 24 (b) 1, 4 (c) 3, 7 (d) 21, 22

Q.85. How many multiples of 7 are there between 100 and 200 ?
SSC MTS 22/07/2022 (Evening)
(a) 14 (b) 15 (c) 12 (d) 16

Q.86. If the number 732XY is divisible by 70, then find the minimum value of $\frac{x+y}{2}$.
SSC CHSL 31/05/2022 (Afternoon)
(a) 2 (b) 1 (c) 0 (d) 3

Q.87. If each of the two numbers 5^{16} and 5^{25} are divided by 6, the remainder are R_1 and R_2, respectively. What is the value of $\frac{R_1 + R_2}{R_2}$?
SSC CGL 19/04/2022 (Morning)
(a) $\frac{1}{6}$ (b) $\frac{5}{6}$ (c) $\frac{1}{5}$ (d) $\frac{6}{5}$

Q.88. Find the difference between squares of the greatest value and the smallest value of P if the number 5306P2 is divisible by 3.
SSC CGL 16/08/2021 (Evening)
(a) 60 (b) 68 (c) 36 (d) 6

Q.89. When a number is divided by 14, the remainder is 9. If the square of the same number is divided by 14, then the remainder will be:
SSC CHSL 21/10/2020 (Afternoon)
(a) 11 (b) 9 (c) 10 (d) 8

Q.90. Which among the following is the smallest?
SSC CPO 09/12/19 (Morning)
(a) √401 - √399 (b) √101 - √99
(c) √301 - √299 (d) √201 - √199

Q.91. When an integer n is divided by 8 , the remainder is 3. What will be the remainder if 6n - 1 is divided by 8 ?
SSC CGL 13/06/2019 (Evening)
(a) 4 (b) 1 (c) 0 (d) 2

Q.92. If the six digit number 15x1y2 is divisible by 44, then (x + y) is equal to :
SSC CGL 10/06/2019 (Afternoon)
(a) 8 (b) 7 (c) 6 (d) 9

Q.93. On dividing a number by 38, the quotient is 24 and the remainder is 13, then the number is:
SSC CPO 16/03/2019 (Morning)
(a) 925 (b) 975 (c) 904 (d) 956

Q.94. What is the difference between the largest and smallest numbers of the four digits created using numbers 2, 9, 6, 5? (Each number can be used only once)
SSC CPO 14/03/2019 (Evening)
(a) 6993 (b) 7056 (c) 6606 (d) 7083

Railway Previous Year Questions

Q.95. If a number is divisible by 4, then which of the following statements is true ?
RRC Group D 06/10/2022 (Evening)
(a) The unit place in the number is 0.
(b) The sum of the digits in the number is divisible by 4.
(c) The number will be divisible by 2 and 6.
(d) The number formed by its last two digit is divisible by 4.

Q.96. Arrange the numbers given below in ascending order.
705.0, 7.005, 7.500, 70.50, 7050, 7.050, 75
RRC Group D 30/09/2022 (Morning)
(a) 7050, 705.0, 75, 70.50, 7.500, 7.050, 7.005
(b) 7.005, 7.500, 7.050, 70.50, 75, 705.0, 7050
(c) 7.005, 7.500, 7.050, 75, 70.50, 705.0, 7050
(d) 7.005, 7.050, 7.500, 70.50, 75, 705.0, 7050

Q.97. The value of $(11^0 + 21^0 - 7^0 + 3^0) \times 5^0$ is:
RRC Group D 12/09/2022 (Evening)
(a) 0 (b) 2 (c) 1 (d) 3

Q.98. Five times a number is 65 . Find the number.
RRC Group D 02/09/2022 (Evening)
(a) 15 (b) 11 (c) 13 (d) 10

Q.99. From the numbers 51, 52, 53, ... 100. find the sum of the smallest and the greatest prime numbers as given.
RRC Group D 22/08/2022 (Afternoon)
(a) 123 (b) 150 (c) 139 (d) 154

Q.100. If 13.5 kg of grapes cost Rs 681.75, Find the cost of 12 kg of grapes.
NTPC CBT II (16/06/2022) 2nd Shift
(a) 606.00 (b) 612.00
(c) 603.00 (d) 610.00

Q.101. What is the difference between the largest and the smallest single - digit prime numbers?
RRB NTPC CBT - I 19/03/2021 (Morning)
(a) 8 (b) 6 (c) 5 (d) 7

Q.102. The reciprocal of the sum of the reciprocals of $\frac{5}{7}$ and $\frac{9}{5}$ is :
RRB NTPC CBT - I 27/02/2021 (Morning)
(a) $\frac{88}{35}$ (b) $\frac{88}{45}$ (c) $\frac{45}{88}$ (d) $\frac{35}{88}$

Q.103. The remainder in the expression $27\frac{3}{4}$ *is*:
RRB NTPC CBT - I 15/02/2021 (Morning)
(a) 3 (b) 6 (c) 8 (d) 4

Q.104. Select the option that expresses $5.\overline{6}$ as a fraction.
RRB NTPC CBT - I 15/02/2021 (Morning)
(a) $\frac{61}{90}$ (b) $\frac{51}{90}$ (c) $\frac{57}{90}$ (d) $\frac{50}{90}$

Q.105. Assuming A = 1 , B = 2 and so on ..... Z = 26 , find the value of the following equation. $(I^2 - C^2 \times \frac{P}{R}) + 8$
RRB NTPC CBT - I 12/02/2021 (Morning)
(a) 90 (b) 73 (c) 81 (d) 78

Q.106. The product of first five whole numbers is:
RRB NTPC CBT - I 12/02/2021 (Morning)
(a) 10 (b) 0 (c) 120 (d) - 120

Q.107. If 58 out of 100 students in a school are boys, then express the part of the school that consists of boys in decimal.
RRB NTPC CBT - I 08/02/2021 (Evening)
(a) 0.58 (b) 0.85 (c) 0.8 (d) 0.5

Q.108. Find the number whose four-fifth is more than its three fourth by 4.
RRB NTPC CBT - I 03/02/2021 (Evening)
(a) 70 (b) 80 (c) 100 (d) 90

Q.109. What is the number of divisors of 120 ?
RRB NTPC CBT - I 02/02/2021 (Evening)
(a) 16 (b) 19 (c) 15 (d) 17

Q.110. How many prime numbers are there that are less than 50 ?
RRB NTPC CBT - I 22/01/2021 (Evening)
(a) 16 (b) 13 (c) 15 (d) 14

Q.111. The decimal expression of $\frac{3}{8}$ comes to an end after how many digits after the decimal ?
RRB NTPC CBT - I 20/01/2021 (Morning)
(a) 3 (b) 2 (c) 4 (d) 5

Q.112. Find the greatest ratio in the following.
RRB NTPC CBT - I 16/01/2021 (Morning)
(a) 13 : 21 (b) 5 : 18 (c) 15 : 28 (d) 19 : 27

Q.113. The number 1.112123123412345 ..... Is a/an :
RRB NTPC CBT - I 13/01/2021 (Morning)
(a) irrational number (b) natural number
(c) rational number (d) integer

Q.114. The smallest of the four consecutive odd numbers having sum 160 is :
RRB NTPC CBT - I 10/01/2021 (Morning)
(a) 35 (b) 41 (c) 39 (d) 37

Q.115. How many numbers from 3 to 60 are odd numbers that are exactly divisible by 5 ?
RRB NTPC CBT - I 09/01/2021 (Morning)
(a) 5 (b) 8 (c) 7 (d) 6

Q.116. Which of the following is NOT a rational number ?
$\sqrt{3^2 + 4^2}$, $\sqrt{12.96}$, $\sqrt{125}$ and $\sqrt{900}$
RRB NTPC CBT - I 05/01/2021 (Morning)
(a) $\sqrt{900}$ (b) $\sqrt{125}$
(c) $\sqrt{3^2 + 4^2}$ (d) $\sqrt{12.96}$

Q.117. A + 0 = 0 + A = A , where A is a real number is true, because of
(a) The commutative property of addition
(b) The additive property of zero
(c) The associative property of addition
(d) The inverse property of addition

Banking Questions (Memory Based Previous Year)

Q.118. Find the multiple of 11 in the following numbers.
SBI PO Pre 19/12/2022 (2nd Shift)
(a) 978648 (b) 869756 (c) 447377
(d) 447355 (e) None of these

Q.119. The numerator of a rational number is 4 less than the denominator. If the numerator is increased by 15 and denominator is decreased by 4, we get 6. Find the rational number?
IBPS PO Mains (26/11/2022)
(a) $\frac{1}{5}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{5}{9}$
(e) None of these

Q.120. The digit in the unit's place of the number $(67)^{25}$ - 1 must be
IBPS PO Mains (26/11/2022)
(a) 7 (b) 6 (c) 8 (d) 10 (e) None of these

Q.121. Two third of a positive number and $\frac{25}{216}$ of its reciprocal are equal.The number is :
SBI Clerk Pre 12/11/2022 (1st Shift)
(a) $\frac{12}{5}$ (b) $\frac{25}{144}$ (c) $\frac{5}{12}$ (d) $\frac{144}{25}$ (e) $\frac{13}{17}$

Q.122. The difference between the local value and the face value of 5 in the numeral 32675149 is
SBI Clerk Pre 12/11/2022 (1st Shift)
(a) 4994 (b) 4995 (c) 6995
(d) 5142 (e) 4125

Q.123. If the largest four digit number is subtracted from the smallest six digit number, then the remainder is
SBI Clerk Pre 12/11/2022 (2nd Shift)
(a) 90000 (b) 90001 (c) 9001
(d) 90007 (e) None of these

Q.124. If $(72)^2$ is subtracted from the square of a number, the answer so obtained is 6052. What is the number?
RRB Clerk Pre 07/08/2022 (1st Shift)
(a) 96 (b) 102 (c) 104 (d) 106
(e) None of these

Q.125. 25% of a number is 2 times 65% of another number. Find the ratio of the second no to the first number?
RRB Clerk Pre 07/08/2022 (1st Shift)
(a) 13 : 5 (b) 5 : 26 (c) 7 : 13
(d) 26 : 5 (e) None of these

Q.126. A number gets reduced to its two - third when 24 is subtracted from it. Find one-ninth of the number?
RRB PO Mains (30/01/2021)
(a) 7 (b) 8 (c) 9 (d) 10 (e) None of these

MBA Previous Year Questions

Q.127. Let S(n) represent the sum of digits of a natural number n. For example, S(128) = 1 + 2 + 8 = 11. What is the value of $S(2^6 \times 3^4 \times 5^5)$?
CMAT 04/05/2023 (1st Slot)
(a) 9 (b) 11 (c) 14 (d) 10

Defence Exams Previous Year Questions

Q.128. The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator.

Determine the fraction.
AFCAT 27/08/2023 (1st Shift)
(a) $\frac{18}{7}$ (b) $\frac{16}{7}$ (c) $\frac{7}{18}$ (d) $\frac{7}{16}$

Q.129. A number is 124 more than its one-third. What is that number?
UPSC CAPF (07/08/2022)
(a) 194 (b) 180 (c) 189 (d) 186

Q.130. A test consists of 25 MCQs. Each correct answer gives +4 marks and incorrect answer gives -1 mark. If a candidate scores 74 marks, then how many questions were left unattempted?
UPSC CAPF (07/08/2022)
(a) 4 (b) 3 (c) 5 (d) 9

Q.131. $4^{61} + 4^{62} + 4^{63} + 4^{64}$ is divisible by ?
UPSC CDS - I (10/04/2022)
(a) 7 (b) 9 (c) 11 (d) 17

Other Exams Previous Year Questions

Q.132. The difference between the two numbers is 24. If one number is 2 times the second. Then the two numbers will be :
CUET UG 15/06/2023 (2nd shift)
(a) 36, 12 (b) 48, 24 (c) 32, 8 (d) 12, 6

Q.133. A boy was asked to multiply a certain number by 25. He, by mistake, multiplied the number by 52 and got the product which was greater than the correct product by 324. The number to be multiplied was:
Haryana CET 06/11/2022 (1st Shift)
(a) 52 (b) 12 (c) 15 (d) 25

Q.134. The sum of two numbers is 15 and the difference between their squares is also 15. Which of the following is the larger number?
Delhi Police H.C.M. 14/10/2022(Evening)
(a) 7 (b) 9 (c) 3 (d) 8

Q.135. Number of prime factors $(\frac{1}{6})^{12} \times 8^{25} \times (\frac{3}{4})^{15}$ is :
UPPSC CSAT (12/06/2022)
(a) 36 (b) 37 (c) 52 (d) 33

Q.136. Find the least value of 'x' so that the number '97468x4' is divisible by 8.
UKPSC CSAT (03/04/2022)
(a) 2 (b) 3 (c) 4 (d) 5

Q.137. Find the remainder when 961^{125} divided by 37.
UP S.I. 21/11/2021 (Morning)
(a) 34 (b) 36 (c) 32 (d) 30

Q.138. For every, natural number n, $n(n + 5)$is always-
Bihar Police Cons. 14/03/2021 (1st Shift)
(a) an even number (b) an odd number
(c) a multiple of 3 (d) a multiple of 5

Q.139. When a number is divided by 119, the remainder is 19. What will be the remainder when the same number is divided by 17 ?
Delhi Police Exe. 11/12/2020 (Morning)
(a) 5 (b) 7 (c) 2 (d) 1

Q.140. The difference between two whole numbers is 2507. When the larger number is divided by the smaller the quotient is 9 and the remainder is 11. The large number is :
Delhi Police Exe. 03/12/2020 (Evening)
(a) 2819 (b) 3131 (c) 2713 (d) 2687

Q.141. A student has 37.5 meter of rope and he has to make 8 pieces out of a meter of rope. How many such pieces can he make out of his rope?
DDA Patwari 12/11/2020 (Afternoon)
(a) 295 (b) 300 (c) 225 (d) 305

Q.142. A number when divided by 221, leaves a remainder 30. If the same number is divided by 13, the remainder will be :
DDA Patwari 05/11/2020 (Morning)
(a) 4 (b) 3 (c) 2 (d) 1

Q.143. 7 is added to a certain number and the sum is multiplied by 5. The product is then divided by 3 and 4 is subtracted from the quotient. If the result comes to 16, then what is the original number ?
DDA Patwari 05/11/2020 (Morning)
(a) 3 (b)1 (c) 5 (d) 4

Q.144. Find the number of even prime factors in the factorization of 48.
DMRC JEE 26/02/2020 (1st shift)
(a) 1 (b) 2 (c) 0 (d) 4

Q.145. The unit digit of $(4367)^{245}$ is -
Bihar Police Constable 12/01/2020
(a) 7 (b) 9 (c) 1 (d) 3

Q.146. Find the product of the sum of digits of the smallest 4-digit number divisible by 11 and the sum of the digits of smallest 4 - digit number divisible by 13.
UP Constable 27/01/2019 (1st Shift)
(a) 1 (b) 2 (c) 4 (d) 6

Q.147. Which of the numbers given below is exactly divisible by 24 ?
UP Constable 26/10/2018 (1st Shift)
(a) 14744 (b) 28856
(c) 43976 (d) 57528

Moderate Section

SSC Previous Year Questions

Q.148. At a certain time in a park, the number of heads and the number of legs of monkeys and human visitors were counted, and it was found that there were 54 heads and 148 legs. Find the number of monkeys in the park.
SSC CGL Tier II (26/10/2023)
(a) 20 (b) 16 (c) 18 (d) 14

Q.149. A six - digit number 11p9q4 is divisible by 24. Then the greatest possible value for pq is:
SSC CGL Tier II (26/10/2023)
(a) 56 (b) 68 (c) 42 (d) 32

Q.150. If a 10 - digit number 620x976y52 is divisible by 88, then the least value of $(x^2 + y^2)$ will be:
SSC CHSL 14/08/2023 (3rd Shift)
(a) 8 (b) 7 (c) 11 (d) 10

Q.151. What will be the greatest number 32a78b, which is divisible by 3 but NOT divisible by 9? (Where a and b are single digit numbers).
SSC CHSL 09/08/2023 (2nd Shift)
(a) 324781 (b) 329787
(c) 326787 (d) 329784

Q.152. If 7 divides the integer n, then the remainder is 2. What will be the remainder if 9n is divided by 7 ?
SSC CHSL 09/08/2023 (1st Shift)
(a) 3 (b) 5 (c) 1 (d) 4

Q.153. Two numbers, when divided by a certain divisor, leave the remainder 57. When sum of the two numbers is divided by the same divisor, the remainder is 49. The divisor is:
SSC CHSL 08/08/2023 (3rd Shift)
(a) 56 (b) 57 (c) 49 (d) 65

Q.154. In a division sum, the divisor is 11 times the quotient and 5 times the remainder. If the remainder is 44, then the dividend is:
SSC CHSL 07/08/2023 (4th Shift)
(a) 8888 (b) 4448 (c) 8444 (d) 4444

Q.155. When a number is divided by 7, leaves 1 as the remainder. When the cube of this number is divided by 7, what will be the remainder?
SSC CHSL 04/08/2023 (3rd Shift)
(a) 4 (b) 2 (c) 3 (d) 1

Q.156. What is the least value of x + y, if 10 digit number 780x533y24 is divisible by 88 ?
SSC CHSL 03/08/2023 (4th Shift)
(a) 4 (b) 3 (c) 1 (d) 2

Q.157. Find the remainder when $8^8 + 6$ is divided by 7.
SSC CGL 25/07/2023 (1st shift)
(a) 0 (b) 2 (c) 3 (d) 1

Q.158. Which number among 34936, 35508, 35580 and 36508 is divisible by 33 ?
SSC CGL 20/07/2023 (4th shift)
(a) 35508 (b) 35580 (c) 36508 (d) 34936

Q.159. Mohan divides 18935 by a certain number. If the quotient and the remainder he gets are 102 and 65, respectively, then the divisor is:
Selection Post 27/06/2023 (3rd Shift)
(a) 155 (b) 165 (c) 175 (d) 185

Q.160. Which is the smallest three-digit number which when increased by 5 becomes divisible by both 2 and 3?
SSC MTS 13/06/2023 (Morning)
(a) 102 (b) 105 (c) 103 (d) 108

Q.161. What is the sum of all two digit even numbers?
SSC CHSL 15/03/2023 (1st Shift)
(a) 2520 (b) 2470 (c) 2430 (d) 2410

Q.162. $3^{50} + 9^{26} + 27^{18} + 9^{28} + 9^{29}$ is divisible by which of the following integers ?
SSC CGL 06/12/2022 (2nd Shift)
(a) 11 (b) 5 (c) 7 (d) 2

Q.163. The nearest number which is greater to 87501, and is completely divisible by 765 is :
SSC CGL 03/12/2022 (1st Shift)
(a) 88975 (b) 87975
(c) 87966 (d) 87775

Q.164. The sum of the first 78 natural numbers from 1 to 78 is divisible by
SSC CHSL 01/06/2022 (Evening)
(a) 79 (b) 61 (c) 29 (d) 30

Q.165. Find the greatest number 23a68b, which is divisible by 3 but NOT divisible by 9 .
SSC CGL 11/04/2022 (Morning)
(a) 238689 (b) 239685
(c) 239688 (d) 237687

Q.166. The difference between a positive number and its reciprocal increases by a factor of $\frac{175}{144}$ when the number is made to increase by 20%. What is the number?
SSC MTS 12/10/2021 (Afternoon)
(a) 7.5 (b) 6 (c) 2.5 (d) 5

Q.167. Find the sum of all the possible values of (a + b), so that number 4a067b is divisible by 11.
SSC CGL 24/08/2021 (Afternoon)
(a) 5 (b) 16 (c) 21 (d) 11

Q.168. When a number is divided by 3, the remainder is 2. Again, when the quotient is divided by 7, the remainder is 5. What will be the remainder when the original number is divided by 21?
SSC CHSL 11/08/2021 (Morning)
(a) 14 (b) 13 (c) 17 (d) 16

Q.169. Given that $2^{20} + 1$ is completely divisible by a whole number. Which of the following is completely divisible by the same number ?
SSC CHSL 16/10/2020 (Afternoon)
(a) $2^{15} + 1$ (b) 5×2^{30}
(c) $2^{90} + 1$ (d) $2^{60} + 1$

Q.170. If the six digit number 479xyz is exactly divisible by 7, 11 and 13 , then {(y + z) ÷ x} is equal to :
SSC CPO 09/12/2019 (Morning)
(a) $\frac{11}{9}$ (b) 4 (c) $\frac{13}{7}$ (d) $\frac{7}{13}$

Q.171. When 12,16,18,20 and 25 divide the least number x, the remainder in each case is 4 but x is divisible by 7. What is the digit at the thousands' place in x ?
SSC CGL Tier II (11/09/2019)
(a) 5 (b) 8 (c) 4 (d) 3

Q.172. When 6892, 7105 and 7531 are divided by the greatest number x, then the remainder in each case is y. What is the value of (x - y) ?
SSC MTS 22/08/2019 (Afternoon)
(a) 123 (b) 137 (c) 147 (d) 113

Railway Previous Year Questions

Q.173. If x + y= 18 , Product of x and y is 77, then which of the following pairs of numbers can be the values of x and y. Respectively ?
RRC Group D 12/09/2022 (Afternoon)
(a) 12 and 6 (b) 11 and 7
(c) 9 and 9 (d) 8 and 10

Q.174. Three numbers $x \le y \le z$ which are co-prime to each other are such that the product of the first two numbers is 143 and that of the last two numbers is 195. The sum of the three numbers is _____.
RRC Group D 01/09/2022 (Afternoon)
(a) 29 (b) 39 (c) 62 (d) 45

Q.175. The total number of three-digit numbers divisible by 2 or 5 is ?
RRC Group D 23/08/2022 (Afternoon)
(a) 540 (b) 400 (c) 245 (d) 270

Q.176. A number, when divided by the sum of 335 and 265, gives three times the difference between 335 and 265 as the quotient and 35 as the remainder. What is that number ?
RRC Group D 22/08/2022 (Morning)
(a) 126035 (b) 128235
(c) 124535 (d) 127535

Q.177. In what way can the terms of the given set be rearranged into three sets such that the sum of the two terms in each set is equal ?
(947, 861, 1304, 1218, 1378, 787)
NTPC CBT II (15/06/2022) 2nd Shift
(a) (787, 1378), (947, 1304), (861, 1218)
(b) (947, 1218), (861, 1304), (787, 1378)
(c) (861, 1218), (947, 1378), (787, 1304)
(d) (947, 1304), (861, 1378), (787, 1218)

Q.178. Which of the following numbers is divisible by 7 , 11 and 13 ?
NTPC CBT II (14/06/2022) 1st Shift
(a) 1002001 (b) 1003001
(c) 1005001 (d) 1004001

Q.179. The negative of a non - zero rational number is:
RRB NTPC CBT - I 06/04/2021 (Morning)
(a) surd
(b) zero
(c) a rational number
(d) an irrational number

Q.180. If P is a prime number and P divides Q^2, then P will NOT necessarily divide:
RRB NTPC CBT - I 27/03/2021 (Morning)
(a) 3Q (b) Q + 1 (c) $2Q^2$ (d) Q

Q.181. Two numbers are such that the sum of $\frac{1}{3}$ of the first number and $\frac{1}{2}$ of the second number is 8. The sum of $\frac{1}{5}$ of the first number and $\frac{1}{6}$ of the second number is 4. What is the largest of the two numbers?
RRB NTPC CBT - I 23/02/2021 (Morning)
(a) 11 (b) 6 (c) 21 (d) 15

Q.182. If the sum of five consecutive multiples of 2 is 660, then find the larger number.
RRB NTPC CBT - I 15/02/2021 (Evening)
(a) 125 (b) 162 (c) 130 (d) 136

Q.183. What is the difference between the biggest and the smallest fraction among $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}$, and $\frac{5}{6}$?
RRB NTPC CBT - I 15/02/2021 (Evening)
(a) $\frac{1}{20}$ (b) $\frac{1}{30}$ (c) $\frac{1}{12}$ (d) $\frac{1}{6}$

Q.184. How many numbers less than 10000 are there which are exactly divisible by 21, 35 and 63?

RRB NTPC CBT - I 02/02/2021 (Morning)
(a) 32 (b) 30 (c) 34 (d) 31

Q.185. ($2^{25} + 2^{26} + 2^{27} + 2^{28}$) is a multiple of which of the following numbers?
RRB JE 02/06/2019 (Afternoon)
(a) 7 (b) 9 (c) 11 (d) 15

Q.186. From the set of prime numbers between 50 and 100, how many pairs of prime are there that add up to a prime number?
RRB JE 02/06/2019 (Afternoon)
(a) 0 (b) 3 (c) 2 (d) 1

Q.187. Split 69 into three parts such that they are in A.P. and the product of their smaller parts is 483.
RRB ALP Tier - I (30/08/2018) Morning
(a) 15,23,31 (b) 19,23,27
(c) 17,23,29 (d) 21,23,25

Banking Questions (Memory Based Previous Year)

Q.188. The sum of three numbers is 264. If the first number be twice the second and third number be one third of the first then the second number is
SBI Clerk Mains (15/01/2023)
(a) 82 (b) 72 (c) 76
(d) 87 (e) None of these

Q.189. The digits of a two-digit number are in the ratio of 3 : 2 and the number obtained by interchanging the digits is lesser than the original number by 27. What is the original number?
SBI PO Pre 19/12/2022 (1st Shift)
(a) 63 (b) 48 (c) 96 (d) 69 (e) 66

Q.190. If the number obtained on interchanging the digits of a 2 digit number is 18 more than the original number and the sum of the digit is 8.Then what is the original number?
IBPS PO Pre 16/10/2022 (2nd Shift)
(a) 35 (b) 53 (c) 32 (d) 34
(e) None of these

Q.191. The multiplication of two numbers is 9375 and the quotient, when the greater is divided by the smaller is 15. The sum of the numbers is:
RRB Clerk Mains (24/09/2022)
(a) 600 (b) 125 (c) 275 (d) 400
(e) None of the above

Q.192. A certain number of two digits is three times the sum of its digits and if 45 be added to it, the digits are reversed. The number is ?
RRB Clerk Pre 13/08/2022 (1st Shift)
(a) 23 (b) 25 (c) 27 (d) 29
(e) None of these

Q.193. Which of the following numbers is a divisor of $(49^{15} - 1)$?
RRB Clerk Pre 13/08/2022 (1st Shift)
(a) 46 (b) 14 (c) 8 (d) 50
(e) None of these

Q.194. If n is a whole number greater than 1, then $n^2(n^2 - 1)$ is always divisible by
LIC Assistant Mains (22/12/2019)
(a) 24 (b) 48 (c) 12 (d) 60
(e) None of these

Q.195. If $31^{47} + 43^{47}$ is divided by 37, the remainder is:
LIC Assistant Pre 31/10/2019 (1st Shift)
(a) 0 (b) 2 (c) 1 (d) 3 (e) None of these

MBA Previous Year Questions

Q.196. Consider a sequence of real numbers $x_1, x_2, x_3, \ldots$ such that $x_{n+1} = x_n + n - 1$ for all $n \geq 1$. If $x_1 = -1$ then x_{100} is equal to
CAT 28/11/2021 (3rd Slot)
(a) 4850 (b) 4950 (c) 4849 (d) 4949

Q.197. The natural numbers are divided into groups as (1), (2, 3, 4), (5, 6, 7, 8, 9), ... and so on. Then, the sum of the numbers in the 15th group is equal to
CAT 28/11/2021 (1st Slot)
(a) 6119 (b) 4941 (c) 6090 (d) 7471

Q.198. x is a whole number. If the only common factors of x and x^2 are 1 and x, then x is _____ ?
MAT Exam December 2018
(a) 1 (b) a perfect square
(c) an odd number (d) a prime number

Q.199. A number consists of 3 digits whose sum is 10. The middle digit is equal to the sum of the other two and the number will be increased by 99 if its digits are reversed. The number is
IGNOU MBA 24/09/2017
(a) 145 (b) 253 (c) 370 (d) 352

Defence Exams Previous Year Questions

Q.200. How many three-digit numbers are possible such that the difference between the original number and the number obtained by reversing the digits is 396 ? (no digit is repeated)
UPSC CAPF (06/08/2023)
(a) 4 (b) 5 (c) 50 (d) 40

Q.201. What is the largest number which divides both $2^{35} - 1$ and $2^{91} - 1$?
UPSC CDS - I (16/04/2023)
(a) 34 (b) 90 (c) 127 (d) 129

Q.202. The sum of digits of a 2 - digit number is 12.When the digits are reversed, the number becomes greater by eighteen. What is the difference between the digits in the number?
UPSC CDS - I (16/04/2023)
(a) 1 (b) 2 (c) 3 (d) 4

Q.203. Consider the following statements in respect of all factors of 360 :
1. The number of factors is 24.
2. The sum of all factors is 1170.
Which of the above statements is/are correct ?
UPSC CDS - I (16/04/2023)
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Other Exams Previous Year Questions

Q.204. How many 3 - digit natural numbers (without repetition of digits) are there such that each digit is odd and the number is divisible by 5 ?
UPSC CSAT (05/06/2022)
(a) 8 (b) 12 (c) 16 (d) 24

Q.205. What is the remainder when $85 \times 87 \times 89 \times 91 \times 95 \times 96$ is divided by 100 ?
UPSC CSAT (28/05/2023)
(a) 0 (b) 1 (c) 2 (d) 4

Q.206. A nine - digit number 89563x87y is divisible by 72. What is the value of $\sqrt{7x - 3y}$?
SSC GD Constable 16/11/2021 (Morning)
(a) 8 (b) 5 (c) 6 (d) 4

Q.207. The difference between the two numbers is 3630. The quotient and remainder are respectively 30 and 5 when the larger number is divided by the smaller one. Find the larger number.
UP S.I. 16/11/2021 (Afternoon)
(a) 4055 (b) 3955 (c) 3855 (d) 3755

Q.208. Product of two positive numbers is 378 and the first number is 3 more than the second number. What is the sum of these numbers?
DDA Patwari 05/11/2020 (Afternoon)
(a) 39 (b) 33 (c) 45 (d) 21

Tough Section

SSC Previous Year Questions

Q.209. The remainder of the term $9 + 9^2 + \ldots + 9^{(2n+1)}$ when divided by 6 is:
SSC CHSL 11/08/2023 (4th Shift)

(a) 1 (b) 4 (c) 2 (d) 3

Q.210. A four - digits number abba is divisible by 4 and a < b. How many such numbers are there?
SSC CGL 26/07/2023 (1st shift)
(a) 10 (b) 8 (c) 12 (d) 6

Q.211. During a division, Pranjal mistakenly took as the dividend a number that was 10% more than the original dividend. He also mistakenly took as the divisor a number that was 25% more than the original divisor. If the correct quotient of the original division problem was 25 and the remainder was 0, what was the quotient that Pranjal obtained, assuming his calculations had no error?
SSC CGL 17/07/2023 (4th shift)
(a) 21.75 (b) 21.25 (c) 28.75 (d) 22

Q.212. A and B have some toffees. If A gives one toffee to B, then they have an equal number of toffees. If B gives one toffee to A, then A's toffees are double that of B. The total number of toffees with A and B are_____.
SSC CGL 14/07/2023 (3rd shift)
(a) 12 (b) 10 (c) 14 (d) 15

Q.213. The sum of two numbers is 680. If the bigger number is decreased by 15% and the smaller number is increased by 15%, then the resultant numbers are equal. Find the smaller number.
SSC CGL 13/12/2022 (2nd Shift)
(a) 307 (b) 289 (c) 291 (d) 304

Q.214. The number 150328 is divisible by 23. If the digits are rearranged in descending order and five times of 13 is subtracted from the new number thus formed, then the resultant number will be divisible by:
SSC CPO 10/11/2022 (Morning)
(a) 3 (b) 5 (c) 11 (d) 2

Q.215. What is the value of $\frac{7}{2}+\frac{11}{3}+\frac{7}{6}+\frac{11}{15}+\frac{7}{12}+\frac{11}{35}+.....+\frac{7}{156}+\frac{11}{575}$?
SSC CGL Tier II (08/08/2022)
(a) $\frac{3917}{355}$ (b) $\frac{3816}{325}$ (c) $\frac{3714}{345}$ (d) $\frac{3216}{315}$

Q.216. When f(x) $= 15x^3 - 14x^2 - 4x + 10$ is divided by (3x + 2), then the remainder is :
SSC CHSL 27/05/2022 (Afternoon)
(a) −1 (b) 1 (c) −2 (d) 2

Q.217. What will be the smallest natural number to be filled in the blank for the number '23_45678' to be divisible by 22 ?
SSC CHSL 25/05/2022 (Morning)
(a) 7 (b) 1 (c) 9 (d) 3

Q.218. If the 9 - digit number 7x79251y8 is divisible by 36, What is the value of $(10x^2 - 3y^2)$ for the largest possible value of y ?
SSC CGL 13/04/2022 (Morning)
(a) 490 (b) 289 (c) 192 (d) 298

Q.219. Let p, q, r and s be positive natural numbers having three exact factors including 1 and the number itself If q > p and both are two-digit numbers, and r > s and both are one-digit numbers, then the value of the expression $\frac{p-q-1}{r-s}$ is:
SSC CGL Tier II (03/02/2022)
(a) - s - 1 (b) s - 1 (c) 1 - s (d) s + 1

Q.220. If the sum of two positive numbers is 65 and the square root of their product is 26, then the sum of their reciprocals is:
SSC CGL Tier II (29/01/2022)
(a) $\frac{3}{52}$ (b) $\frac{1}{52}$ (c) $\frac{5}{52}$ (d) $\frac{7}{52}$

Q.221. The average of squares of five consecutive odd natural numbers is 233. What is the average of the largest number and the smallest number?
SSC CGL 20/08/2021 (Morning)
(a) 11 (b) 17 (c) 13 (d) 15

Q.222. Two positive numbers differ by 2001. When the larger number is divided by the smaller number, the quotient is 9 and the remainder is 41. The sum of the digits of the larger number is :
SSC CGL Tier II (13/09/2019)
(a) 15 (b) 11 (c) 10 (d) 14

Q.223. Let a,b and c be the fractions such that $a \prec b \prec c$. If c is divided by a, the result is $\frac{9}{2}$, which exceeds b by $\frac{23}{6}$. If a + b + c = $\frac{19}{12}$, then (2a + b - c) will be equal to :
SSC CGL Tier II (13/09/2019)
(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{12}$ (d) $\frac{1}{4}$

Railway Previous Year Questions

Q.224. If 12600 $= p^3 \times q^2 \times r^2 \times s^1$, where p, q, r and s are consecutive prime numbers in ascending order, then what is the value of $(3p + 2q - r + s)$?
RRC Group D 11/10/2022 (Afternoon)
(a) 12 (b) 13 (c) 14 (d) 17

Q.225. How many integers lie between $(891)^2$ and $(892)^2$?
RRC Group D 07/10/2022 (Evening)
(a) 1782 (b) 892 (c) 900 (d) 1784

Q.226. The smallest natural number that must be added to 1212 to make it a perfect square is:
RRC Group D 18/08/2022 (Afternoon)
(a) 13 (b) 27 (c) 18 (d) 24

Q.227. Which smallest number must be subtracted from 3467860 so that it becomes exactly divisible by 19?
RRB NTPC CBT - I 31/07/2021 (Morning)
(a) 11 (b) 50 (c) 30 (d) 18

Q.228. What is the least positive integer that should be subtracted from 2750, so that the difference is a perfect cube ?
RRB NTPC CBT - I 24/07/2021 (Evening)
(a) 15 (b) 9 (c) 6 (d) 14

Q.229. Three prime numbers are arranged in descending order . If the product of the first two is 323 and that of the last two is 221, then what is the value of the biggest prime number?
RRB NTPC CBT - I 04/03/2021 (Morning)
(a) 13 (b) 19 (c) 23 (d) 17

Q.230. A boy read three - eighth of a book on one day and four - fifth of the remainder of the book on the next day. If 45 pages still remain unread, how many pages does the book contain?
RRB NTPC CBT - I 27/02/2021 (Morning)
(a) 380 (b) 330 (c) 360 (d) 340

Q.231. The sum of the first 20 terms of the series $\frac{1}{5\times6}+\frac{1}{6\times7}+\frac{1}{7\times8}+.....$ is:
RRB NTPC CBT - I 15/02/2021 (Evening)
(a) 1.6 (b) 16 (c) 0.016 (d) 0.16

Q.232. In a five digit number, the digit in the hundred's place is 2 and the digit in the unit's place is twice the digit in the hundred's place. The number has no thousands. The digit in the ten thousand's place is the sum of the digit in the hundred's place and the digit in the unit's place. The digit in the ten's place is the digit in the ten thousand's place minus 1. The number is:
RRB NTPC CBT - I 09/02/2021 (Morning)
(a) 60254 (b) 60264 (c) 60234 (d) 60224

Q.233. A number consists of 3 digits whose sum is 18 and the middle digit is equal to the sum of the other two. If the number increases by 297 when its digits are reversed, then what is the number ?
RRB NTPC CBT - I 01/02/2021 (Morning)
(a) 486 (b) 495 (c) 585 (d) 396

Q.234. There are two numbers such that the big number is obtained by adding 5 to the other. If the total of the two numbers is 19, find the product of these numbers.
RRB NTPC CBT - I 30/01/2021 (Evening)
(a) 84 (b) 24 (c) 65 (d) 95

Q.235. In four consecutive prime numbers, the product of the last three is 7429 and that of the first three is 4199. The largest of these prime number is:
RRB NTPC CBT - I 30/01/2021 (Evening)
(a) 37 (b) 29 (c) 23 (d) 13

Q.236. A boy was set to multiply 495 by 36, but reading one of the digits in the questions erroneously, he obtained 16740 as his answer. Which digit did he read erroneously ?
RRB NTPC CBT - I 27/01/2021 (Evening)
(a) 9 (b) 8 (c) 2 (d) 7

Q.237. While solving a mathematical problem, Atul squared the initial number and then subtracted 15 from it. Pratul first subtracted 15 from the initial number and then squared the difference. If both obtained the same answer, what was the initial number ?
RRB NTPC CBT - I 23/01/2021 (Evening)
(a) 8 (b) 6 (c) 9 (d) 7

Q.238. Calculate the smallest number which should be subtracted from 0.000327 to make it a perfect square.
RRB NTPC CBT - I 16/01/2021 (Morning)
(a) 0.03 (b) 0.000004
(c) 0.04 (d) 0.000003

Q.239. If the denominator of a rational number is of the form 2^n5^m, where n and m are non - negative integers, then what will be the decimal expansion of the number ?
RRB NTPC CBT - I 05/01/2021 (Morning)
(a) Non-terminating and non-recurring
(b) Non-terminating but recurring
(c) Terminating
(d) Can't be determined

Q.240. The difference between the mean of the first eight composite natural numbers and the mean of the first eight prime numbers, is
RRB NTPC CBT - I 28/12/2020 (Evening)
(a) $\frac{3}{20}$ (b) $\frac{1}{5}$ (c) $\frac{1}{8}$ (d) $\frac{1}{4}$

Q.241. A two-digit number gets reversed on adding 18 to it. The product of the digits is '8'. What is the number?
RRB JE 27/06/2019 (Morning)
(a) 42 (b) 18 (c) 32 (d) 24

Q.242. The product of two numbers is 9375. The quotient, when the largest number is divided by the smallest number is 15. Find the sum of these numbers.
RRB JE 30/05/2019 (Afternoon)
(a) 400 (b) 380 (c) 425 (d) 395

Q.243. The product of three consecutive natural numbers is always divisible by which of the following numbers?
RRB ALP Tier - II (21/01/2019) Afternoon
(a) 7 (b) 6 (c) 4 (d) 5

Q.244. Which of the following is an irrational number?
RRB ALP Tier - II (21/01/2019) Afternoon
(a) $\sqrt{3} \times \sqrt{27}$ (b) $4\sqrt{4}$
(c) $\sqrt{169} - \sqrt{196}$ (d) $\sqrt{9} + \sqrt{7}$

Q.245. The denominator of a rational number exceeds its numerator by 10. If the numerator is increased by 4 and the denominator is reduced by 3, the number obtained is $\frac{5}{6}$. The original rational number is.
RRB ALP Tier - I (31/08/2018) Morning
(a) $\frac{9}{19}$ (b) $\frac{11}{21}$ (c) $\frac{13}{23}$ (d) $\frac{7}{17}$

Banking Questions (Memory Based Previous Year)

Q.246. If a number is in the form of $8^{10} \times 9^7 \times 7^8$, find the total number of prime factors of the given number.
IBPS PO Mains (26/11/2022)
(a) 52 (b) 560 (c) 3360 (d) 25
(e) None of these

Q.247. If $2\frac{1}{2}$ is added to a number and the sum multiplied by $4\frac{1}{2}$ and 3 is added to the product and then divide the sum by $1\frac{1}{5}$, the quotient becomes 25 . What is the number ?
SBI Clerk Pre 12/11/2022 (1st Shift)
(a) $5\frac{1}{2}$ (b) $4\frac{1}{2}$ (c) $2\frac{1}{2}$
(d) $3\frac{1}{2}$ (e) None of these

Q.248. Find the remainder when:
1661 + 1551 + 1441 + 1331 + 1221 is divided by 20.
SBI PO Mains (02/01/2022)
(a) 25 (b) 5 (c) 11 (d) 1 (e) None of these

Q.249. The sum of the squares of three numbers is 138, while the sum of their products taken two at a time is 381. Their sum is
RRB PO Mains (30/01/2021)
(a) 10 (b) 20 (c) 30 (d) 50
(e) None of these

Q.250. How many numbers are there in the set S = {200, 201, 202, ...,800} which are divisible by neither of 5 or 7?
LIC Assistant Mains (22/12/2019)
(a) 410 (b) 412 (c) 411 (d) 413
(e) None of these

MBA Previous Year Questions

Q.251. If M, A and T are distinct positive integers such that M × A × T = 1947, then which of the following is the maximum possible value of M + A + T ?
CMAT 04/05/2023 (1st Slot)
(a) 189 (b) 649 (c) 653 (d) 1949

Q.252. How many three - digit numbers are greater than 100 and increase by 198 when the three digits are arranged in the reverse order?
CAT 28/11/2021 (1st Slot)
(a) 50 (b) 40 (c) 70 (d) 80

Q.253. For a sequence of real numbers $x_1, x_2, x_3, \ldots\ldots x_n$. If $x_1 - x_2 + x_3 - \ldots\ldots + (-1)^{n+1} x_n = n^2 + 2n$ for all natural numbers n, then the sum $x_{49} + x_{50}$ equals
CAT 28/11/2021 (2nd Slot)
(a) 200 (b) 2 (c) -200 (d) -2

Defence Exams Previous Year Questions

Q.254. If x and y are two-digit prime numbers such that y is obtained from x by interchanging its digits and x - y= 36 , then what is the value of xy?
UPSC CAPF (06/08/2023)
(a) 1611 (b) 2701 (c) 4031 (d) 5603

Q.255. Consider the following statements:
1. If n is a natural number, then the number $\frac{n(n^2+2)}{3}$ is also a natural number.
2. If m is an odd integer, then the number $\frac{m^4+4m^2+11}{16}$ is an integer.
Which of the statements given above is/are correct?
UPSC CDS - I (16/04/2023)
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q.256. Let a, b, c and d be four positive integers such that a + b + c + d = 200. If $S = (-1)^a + (-1)^b + (-1)^c + (-1)^d$, then what is the number of possible values of S ?
UPSC CDS - I (16/04/2023)

(a) One (b) Two (c) Three (d) Four

Q.257. If three times the greater of two numbers is divided by the smaller number, the quotient will be 6 and the remainder will be 6. If five times the smaller number is divided by the greater number, the quotient will be 2 and the remainder will be 3. What is the difference between the numbers ?
UPSC CDS - II (04/09/2022)
(a) 8 (b) 9 (c) 10 (d) 12

Other Exams Previous Year Questions

Q.258. If x is a 3 - digit number and y is a number obtained by permuting the digits of x is a manner, then (x - y) is always divisible by :
Haryana CET 05/11/2022 (1st Shift)
(a) 4 (b) 6 (c) 9 (d) 12

Q.259. How many natural numbers are there between $\sqrt{372}$ and $\sqrt{74629}$
CGPSC CSAT (13/02/2022)
(a) 227 (b) 254 (c) 283 (d) 245

Answer Key :-

1.(b)	2.(d)	3.(b)	4.(c)
5.(c)	6.(a)	7.(c)	8.(c)
9.(b)	10.(d)	11.(c)	12.(d)
13.(c)	14.(c)	15.(b)	16.(a)
17.(d)	18.(c)	19.(b)	20.(b)
21.(d)	22.(b)	23.(b)	24.(c)
25.(c)	26.(b)	27.(d)	28.(c)
29.(a)	30.(a)	31.(b)	32.(a)
33.(d)	34.(d)	35.(a)	36.(b)
37.(d)	38.(c)	39.(a)	40.(c)
41.(c)	42.(c)	43.(d)	44.(c)
45.(a)	46.(a)	47.(b)	48.(c)
49.(b)	50.(c)	51.(a)	52.(b)
53.(c)	54.(a)	55.(a)	56.(a)
57.(d)	58.(c)	59.(a)	60.(d)
61.(a)	62.(d)	63.(a)	64.(a)
65.(a)	66.(c)	67.(d)	68.(b)
69.(d)	70.(d)	71.(d)	72.(c)
73.(c)	74.(b)	75.(c)	76.(c)
77.(a)	78.(b)	79.(c)	80.(a)
81.(d)	82.(d)	83.(d)	84.(a)
85.(a)	86.(b)	87.(d)	88.(a)
89.(a)	90.(a)	91.(b)	92.(b)
93.(a)	94.(d)	95.(d)	96.(d)
97.(b)	98.(c)	99.(b)	100.(a)
101.(c)	102.(c)	103.(a)	104.(b)
105.(c)	106.(b)	107.(a)	108.(b)
109.(a)	110.(c)	111.(a)	112.(d)
113.(a)	114.(d)	115.(d)	116.(b)
117.(b)	118.(a)	119.(c)	120.(b)
121.(c)	122.(b)	123.(b)	124.(d)
125.(b)	126.(b)	127.(a)	128.(c)
129.(d)	130.(a)	131.(d)	132.(b)
133.(b)	134.(d)	135.(a)	136.(a)
137.(b)	138.(a)	139.(c)	140.(a)
141.(b)	142.(a)	143.(c)	144.(a)
145.(a)	146.(c)	147.(d)	148.(a)
149.(a)	150.(d)	151.(d)	152.(d)
153.(d)	154.(d)	155.(d)	156.(d)
157.(a)	158.(a)	159.(d)	160.(c)
161.(c)	162.(a)	163.(b)	164.(a)
165.(b)	166.(d)	167.(c)	168.(c)
169.(d)	170.(b)	171.(b)	172.(b)
173.(b)	174.(b)	175.(a)	176.(a)
177.(b)	178.(a)	179.(c)	180.(b)
181.(d)	182.(d)	183.(d)	184.(d)
185.(d)	186.(a)	187.(d)	188.(b)
189.(c)	190.(a)	191.(d)	192.(c)
193.(c)	194.(c)	195.(a)	196.(a)
197.(a)	198.(d)	199.(b)	200.(c)
201.(c)	202.(b)	203.(c)	204.(b)
205.(a)	206.(c)	207.(d)	208.(a)
209.(d)	210.(b)	211.(d)	212.(a)
213.(b)	214.(b)	215.(b)	216.(d)
217.(a)	218.(d)	219.(a)	220.(c)
221.(d)	222.(d)	223.(d)	224.(c)
225.(a)	226.(a)	227.(d)	228.(c)
229.(b)	230.(c)	231.(d)	232.(a)
233.(d)	234.(a)	235.(c)	236.(a)
237.(a)	238.(d)	239.(c)	240.(c)
241.(d)	242.(a)	243.(b)	244.(d)
245.(b)	246.(a)	247.(d)	248.(b)
249.(c)	250.(c)	251.(c)	252.(c)
253.(d)	254.(b)	255.(c)	256.(c)
257.(b)	258.(c)	259.(b)	

Solutions :-

Sol.1.(b) $\frac{1000}{55}$ = Rem.(10)
Smallest number which is added to 1000 so that it is divisible by 55
= 1000 + (55 – 10) = 1045

Sol.2.(d) Remainder = 46
Divisor = 46 × 5 = 230
Quotient = $\frac{230}{10}$ = 23
Dividend = 230 × 23 + 46 = 5336

Sol.3.(b) Divisibility by 11 :- Difference between the sum of digits at even and odd places is equal to 0 or multiples of 11.
Clearly 752563 , is not divisibility by 11.
(7 + 2 + 6) – (5 + 5 + 3) = 2

Sol.4.(c) If a number is in the form of $a^n + b^n$, where n is odd, then the number is divisible by (a + b).
$\frac{x^{17} + 1^{17}}{x + 1}$,
it is completely divisible by (x + 1)
Hence, remainder = 0

Sol.5.(c) According to question,
$\frac{m}{7}$ = Remainder = 5
$\frac{3m}{7}$ = Remainder $\frac{(5 \times 3)}{7}$ = Remainder 1

Sol.6.(a) We know that :-
Dividend = Divisor × Quotient + Remainder
Ratio → initial : final
Dividend → 10 : 9
Divisor → 5 : 4

Initial quotient = 24
Initial number = 24 × 5 = 120
120 which is equal to $10x$. $\Rightarrow x = 12$
Final dividend $(9x)$ = 108
Final quotient = $\frac{108}{4}$ = 27

Sol.7.(c) Divisibility rule of 8 = last 3 digits of the number will be divisible by 8.
Last 3 digit of the number = ...326 - 6
= ..... 320 (divisible of the 8)
So the required number will be = 6

Sol.8.(c) $(6^{61} + 6^{62} + 6^{63} + 6^{64})$
$= 6^{61}(1 + 6 + 6^2 + 6^3)$
$= 6^{61}(1 + 6 + 36 + 216) \Rightarrow 6^{61}(259)$
Here, by checking all the options,
259 is divisible by 7.
So, the given number will be divisible by 7.

Sol.9.(b) co-prime factor of 18 = 9 and 2 ,
Given no. must be divisible by both 9 and 2
4 + 5 + 7 + 6 + 4 + 3 + * + 4 = 33 + *
Possible values of * = 3

Sol.10.(d) According to the question,
Let prime number (p) = 11, and composite number (c) = 9
Now,
$\frac{p + c}{p - c} = \frac{11 + 9}{11 - 9} = \frac{20}{2}$ = 10 (even)

2p + c = 2 × 11 + 9 = 31 (odd)
Pc = 11 × 9 = 99 (odd)
So all conditions 1, 2 and 3 are correct.

Sol.11.(c) Series - 29 × 28 × 27 ×...2 ×1
For the largest power of 10 that divides these series be the trailing zeroes of the series
So, we need to find pair of (2 × 5)
Now, 5 present in 5 , 10 , 15 , 20 , 25 = 6
(**Note :-** 25 contributes an additional factor of 5. Hence, there are 6 factors of 5 in total.)
2 present in 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26 and 28
Here, 2 present more than 5
So, only 6 pairs of (5 × 2) are being made
Hence, largest power of 10 that divides the series is 6

Sol.12.(d) 6 digit Number - XYXYXY
XYXYXY = 100000X + 10000Y + 1000X + 100Y + 10X + Y
= (100000X + 1000X + 10X) + (10000Y + 100Y + Y)
= 101010X + 10101Y = 10101(10X + Y)
Number 10101 is divisible by 3, 7, 13 and 37
Hence, number XYXYXY is divisible by 3, 7 , 13 and 37

Sol.13.(c) $(125)^{\frac{1}{6}}, (11)^{\frac{1}{3}}, (12)^{\frac{1}{6}} (5)^{\frac{1}{4}}$
(multiplying by 12 in the power)
$(125)^2, (11)^4, (12)^2, (5)^3$
$= (125)^2, (121)^2, (144)\ , (125)$
Now,
we can see $(125)^{\frac{1}{6}}$ is the largest value.

Sol.14.(c) Let the number be x
According to the question,
$x + \frac{1}{x} = 4$
then, sum of their squares
$x^2 + \frac{1}{x^2} = 16 - 2 = 14$

Sol.15.(b) L.C.M = 2 × 2 × 2 × 3 × 5 × 7
$= 2^3 \times 3^1 \times 5^1 \times 7^1$
Total number of factors
= (3 + 1)(1 + 1)(1 + 1)(1 + 1) = 32
According to the question ,
32 − (2) = 30(except 1 and 840)

Sol.16.(a) 654321 × 123456
On multiplying the given number, the unit digit will be 6 .
From the given option , only option (a) has unit digit 6.
So , 376 will be the last three digits.

Sol.17.(d) Prime numbers between 20 and 50 = (23, 29, 31, 37, 41, 43, 47)
= 7 prime numbers

Sol.18.(c) Let the three consecutive even number x , x + 2 and x + 4
According to the question,
(x + x + 2 + x + 4) = 126
= 3x = 120 ⇒ x = 40
Then, smallest number (x) = 40 and greatest number (x + 4) = 44
Therefore, product of smallest and greatest number = 40 × 44 = 1760

Sol.19.(b) Rule for divisibility of 11
→ The difference between the sum of odd and even place digits is equal to 0 or multiple of 11.
The given number (2918245) is completely divisible by 11 .
2 + 1 + 2 + 5 = 10,
9 + 8 + 4 = 21 = 21 − 10 = 11

Sol.20.(b) Let the six - digit no be abcabc. It can be written as :
100000a + 10000b + 1000c + 100a + 10b + c = 100100a + 10010b + 1001c
= 1001 × (100a + 10b + c)
Clearly, we can see that 6-digit no is always divisible by 1001.

Sol.21.(d) Given 6 - digit no. is 674pq0 is divisible by 33.
For divisible by 3 :- 6 + 7 + 4 + p + q + 0 must be divisible by 3.
For divisible by 11 :- (6 + 4 + q) - (7 + p) must be divisible by 11.
Now, from the option , we can see that the option **(d)** satisfies the condition.
Number is 674520.

Sol.22.(b) Numbers between 1 and 1000, divisible by 2 and 7 →14, 28, 42, 56, 70, ...994
So, number of terms
$= \frac{last\ number - first\ number}{diff.} + 1$
$= \frac{994 - 14}{14} + 1 = 70 + 1 = 71$

Sol.23.(b) 763254 - 205 = 763049
So, the new number formed is divisible by 7.

Sol.24.(c) Jay answered 4 correct answers and + 5 marks are given for every correct answer that means he scored 20 marks for his correct answer
But Jay scored - 12 marks that means he loses his 20 marks of correct answers also.
Total marks deducted due to incorrect answers = 20 + 12 = 32
For every incorrect answer 2 marks are deducted.
So, no of incorrect answers = $\frac{32}{2}$ = 16

Sol.25.(c) Every real numbers are not rational numbers because real numbers also contain irrational numbers. Hence, the option c is not correct.

Sol.26.(b) 1st multiple of 3 = 3
7th multiple of 3 = 21
Therefore average = $\frac{21 + 3}{2}$ = 12

Sol.27.(d) Let the six numbers be x, x + 1, x + 2, x + 3, x + 4 and x + 5.
And, x + (x + 1) + (x + 2) = 27
= 3x + 3 = 27.
Required sum = (x + 3) + (x + 4) + (x + 5)
= 3x + 12 = (3x + 3) + 9 = 27 + 9 = 36.

Sol.28.(c) Given number:
242, 657, 864, 264, 764, 218, 845
after 1 is added to the first digit and 1 is subtracted for the last digit of each number = **341**, 756, **963**, **363**, 863, 317, 944 = (341, 963, 363) , Therefore "3" will be correct answer

Sol.29.(a) Recurring decimal numbers are those numbers that keep on repeating the same value after a decimal point. These numbers are called repeating decimals.
So 3.1212121212... will be the recurring decimal number.

Sol.30.(a) Let the unit digit number be x, and the digit at ten's place be y.
$10y + x + 10x + y = 99$
$= 11x + 11y = 99$
$x + y = 9$..... (1)
$x - y = 5$..... (2)
By solving eq ,(1) and (2),
we get x = 7 and y = 2
Hence, the required number = 27

Sol.31.(b) $9^6 \times 12^4 \times 7^7 = (3 \times 3)^6 \times (2 \times 2 \times 3)^4 \times 7^7$
Hence, sum of the prime factors
= 2 + 3 + 7 = 12

Sol.32.(a) Let the first consecutive natural number be x
Now, $x^2 + (x + 1)^2 = 313$
$x^2 + x^2 + 1 + 2x = 313$
$= 12x^2 + 2x - 312 = 0$
$= x^2 + x - 156 = 0$
$= x^2 + 13x - 12x - 156 = 0$
$= (x + 13)(x - 12) = 0$
Smaller number = 12

Sol.33.(d)
Required numbers from 400 to 700 are :
466, 566, 606, 616, 626, 636, 646, 656, 660, 661, 662, 663, 664, 665, 667, 668, 669, 676, 686, 696.
So, the total such number is 20. Hence, option (d) is the correct answer.

Sol.34.(d) Time taken to read full news

paper = n minutes

Part of newspaper read in 1 minute = $\frac{1}{n}$

Newspaper read in 7 minutes = $\frac{7}{n}$

Sol.35.(a) Let total number of pencils = x

No of coloured pencils = $\frac{3}{4}$ x

No of red coloured pencils

= $\frac{3}{4}$x × $\frac{8}{15}$ = $\frac{2}{5}$x

= $\frac{2}{5}$x = 40 ⇒ x = 100

So total number of pencils = 100

Sol.36.(b) $(\sqrt{2}+\sqrt{3}+\sqrt{5})(\sqrt{2}+\sqrt{3}-\sqrt{5})\sqrt{6}$

$= \{(\sqrt{2}+\sqrt{3})^2-(\sqrt{5})^2\}\sqrt{6}$

$= \{2+3+2\sqrt{6}-5\}\sqrt{6} = 2\sqrt{6}\times\sqrt{6} = 12$

Therefore ,

$(\sqrt{2}+\sqrt{3}+\sqrt{5})(\sqrt{2}+\sqrt{3}-\sqrt{5})\sqrt{6} = 12$ which is rational number

So, the rationalizing factor of

$(\sqrt{2}+\sqrt{3}+\sqrt{5}) = (\sqrt{2}+\sqrt{3}-\sqrt{5})\sqrt{6}$

Sol.37.(d)

Let the original number be : 10x + y

According to the question,

$\frac{1}{7}(10x+y) = \frac{10x+y}{2} - 15$

$20x + 2y = 70x + 7y - 210$

$50x + 5y = 210 = 10x + y = 42$

So, sum of digits = 4 + 2 = 6

Sol.38.(c) These numbers are 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

The 6th number from the bottom is 14.

Sol.39.(a) Let the two numbers are a and b ; i.e. a - b = 45 .....(1)

When 20% of the larger number is added to 35% of the smaller number,

we get a sum of 31.

$= \frac{a}{5} + \frac{7b}{20} = 31$

$4a + 7b = 620$ ..(2)

Solving these two equations we get :

a = 85 and b = 40 ;

Then the sum of the original numbers=125

Sol.40.(c) Let the numerator and denominator be x and y respectively.

So, fraction = $\frac{x}{y}$

According to the question,

$y - x = 3$ .....(1)

$\frac{x+4}{y+4} = \frac{4}{5} = 5x + 20 = 4y + 16$

$5x - 4y = -4$ .....(2)

On solving eqn (1) and (2), we get

$x = 8$ and $y = 11$

So, original fraction = $\frac{x}{y} = \frac{8}{11}$

Sol.41.(c) Sum of squares of first ten natural numbers = $\frac{n(n+1)(2n+1)}{6}$

$= \frac{10(10+1)(2\times10+1)}{6}$

$= \frac{10\times11\times21}{6} = 385$

Sol.42.(c) Let the number = x

According to question,

$= \frac{6x}{5} - \frac{5x}{6} = 572$

$= \frac{36x-25x}{30} = 572 = \frac{11x}{30} = 572$

$= x = \frac{572\times30}{11} = 52\times30 = 1560$

Sol.43.(d) Let the denominator = x

Numerator = x - 2

A/Q, $\frac{x-2-2}{x+2} = \frac{1}{3}$

$= 3x - 12 = x + 2$

$= 2x = 14 \Rightarrow x = 7$

Original fraction = $\frac{7-2}{7} = \frac{5}{7}$

Sol.44.(c) Let the length of the pillar = x

1st part = $\frac{x}{4}$

2nd part = $\frac{x}{4}\times\frac{4}{8} = \frac{x}{8}$

3rd part = $x - (\frac{x}{4}+\frac{x}{8})$

$= x - \frac{3x}{8} = \frac{5x}{8}$

A/Q, = $\frac{5x}{8} = 10 \Rightarrow x = 16\ m$

Sol.45.(a) smallest five -digit number formed by using the digits 2, 3 ,4, 0, 5 = 20345

Sol.46.(a) $9^2 = 81$ *and* $10^2 = 100$

And 90 lies between 81 and 100 so its square root must lie between 9 and 10.

Sol.47.(b) Place value of 5 = 50000000

= 5×10^7

Sol.48.(c) Let number = x

A/Q , = $\frac{x}{2} = 2 \Rightarrow x = 4$

actual answer = $2x = 2\times4 = 8$

Sol.49.(b) $\frac{(3\sqrt{5}+\sqrt{125})}{(\sqrt{80}+6\sqrt{5})}$

$= \frac{(3\sqrt{5}+5\sqrt{5})}{(4\sqrt{5}+6\sqrt{5}} = \frac{8\sqrt{5}}{10\sqrt{5}}$

$= \frac{4}{5}$ (Rational number)

Sol.50.(c) Decimal expansion of $\frac{109}{100}$ is

$= \frac{109}{100} = 1 + \frac{0}{10} + \frac{9}{100}$

Sol.51.(a) In case of the number 0.232323, we can see it is a pure recurring number and '23' is repeated successively. So the bar will be above 0.23, i.e denominator will be 99 and the numerator will be 23. So, if we convert it into a fraction it will be = $\frac{23}{99}$

Sol.52.(b) Let larger number = a

Smaller number = b

a - b = 1280 ....(1)

a = 7b + 50

a - 7b = 50 .....(2)

Multiplying eq (1) by 7

7a - 7b = 8960 ...,..(3)

Subtracting eq (2) from eq 3

6a = 8910 ⇒ a = 1485

Sol.53.(c) According to the question,

12 = 4 × 3

Divisibility rule of 4 = Last 2 digits of the number must be divisible by 4

Divisibility rule of 3 = The sum of the digits of the numbers must be divisible by 3

23M5N,

$\frac{5N}{4}$ = so the minimum possible value of N will be 2

2 + 3 + M + 5 + 2 = 12 + M (minimum possible value of M will be 0)

So the minimum possible value of M and N 0 and 2 respectively.

Sol.54.(a) Total no's less than 1000 which is divisible by 5 = $\frac{1000}{5}$ - 1

= 200 - 1 = 199

Total no's less than 1000 which is divisible by 7 = $\frac{1000}{7}$ = 142

Total no's less than 1000 which is divisible by 35 = $\frac{1000}{35}$ = 28

Required no = (199 + 142 - 28) - 28

= 313 - 28 = 285

Sol.55.(a)

Let the man ate x grapes on first day

According to question,

x + (x + 6) + (x + 12) + (x + 18) + (x + 24)

= 100 = 5x + 60 = 100 ⇒ x = $\frac{40}{5}$ = 8

Sol.56.(a) $3600 = 2^4\times3^2\times5^2$

Number of factors of 3600

= (4 + 1) (2 + 1) (2 + 1) = 45

Sol.57.(d) 1st no. $(N_1) = (15a + 12)$

and 2nd no.$(N_2) = (5a + 2)$

A.T.Q, $\frac{N_1+N_2}{5} = \frac{(15a+12)+(5a+2)}{5}$

$= \frac{20a+14}{5}$ = Rem. 4

Sol.58.(c) Remainder when the given no is divided by 23 is :

$$\frac{2851 \times (2862)^2 \times (2873)^3}{23}$$

$$= \frac{-1 \times 10^2 \times 21^3}{23} = \frac{-1 \times 8 \times (-2)^3}{23}$$

$$= \frac{-1 \times 8 \times -8}{23} = \frac{64}{23} = 18$$

Sol.59. (a) for no. of trailing zeroes

$$\left[\frac{n}{5^1} + \frac{n}{5^2} + \frac{n}{5^3} \ldots..\right]$$

$$76! = \left[\frac{76}{5} + \frac{76}{25}\right] = 15 + 3 = 18$$

Sol.60.(d) To find the no. of ways to distribute equally among children, we find the total no. of factors .

$480 = 2^5 \times 3^1 \times 5^1$

Total required no. of ways

$= 6 \times 2 \times 2 = 24$ ways

Sol.61.(a) $99\frac{1}{2} + 99\frac{1}{6} + 99\frac{1}{12} + 99\frac{1}{20} + 99\frac{1}{30} = (99 + 99 + 99 + 99 + 99) + \left(\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30}\right)$

$$= 495 + \left(\frac{30 + 10 + 5 + 3 + 2}{60}\right)$$

$$= 495\frac{50}{60} = \frac{29750}{60} = \frac{2975}{6}$$

Sol.62.(d) **Given :-** N = 4a6b9c

N is divisible by 99 therefore it must be divisible by both 9 and 11

(4 + 6 + 9) - (a + b + c) = 19 - (a + b + c)

if a + b + c = 8 then N is divisible by both 11 and 9

Hence , sum of digits of N = 19 + 8 = 27

Sol.63.(a) Divisibility rule of 24 that number divisible by 8 and 3.

Divisibility rule of 8 - when the last 3 digits are divisible by 8.

Divisibility rule of 3 - sum of digits divisible by 3

35751 is not divisible by 8 so this number is not divisible by 24

Sol.64.(a) By checking options ,number 76050 is not divisible by 4

Sol.65.(a) Co-prime factor of 12 = (3 , 4)

Given number = 3 * 7440

Checking divisibility by 3 :-

3 + * + 7 + 4 + 4 + 0 = 18 + *

Possible value for '*' = 0 , 3 , 6 , 9

Least possible value for '*' = 0

Sol.66.(c) Co-prime factor of 6 = (2 , 3)

3426x must be divisible by 2 and 3

Divisibility by 3 : - 3 + 4 + 2 + 6 + x

= 15 + x

Possible value of x = 3 , 6 , 9

Divisibility by 2 :- x = 6

So , required number = 34266

Sol.67.(d)

$$\frac{3^8}{7} = \frac{3^3 \times 3^3 \times 3^2}{7} = \frac{27 \times 27 \times 9}{7}$$

$$= \text{Rem.}\frac{(-1) \times (-1) \times (2)}{7} = \text{Rem. (2)}$$

Sol.68.(b)

Factor of 2520 = 2 × 2 × 2 × 3 × 3 × 5 × 7

Clearly 8 ,9 and 7 are the divisors of number 2520 .

Sol.69.(d) $\frac{999999}{294}$ = Rem. (105)

So , required number = 294 − 105 = 189

Sol.70.(d) Co-prime factor of 12 = (3 , 4)

712x816 :- divisible by 4 , as its last two digits is divisible by 4.

Now , checking divisibility by 3 :-

7 + 1 + 2 + x + 8 +1 + 6 = 25 + x

Min. value of x = 2 ⇒ 27 divisible by 3.

Sol.71.(d) Largest 5 digits number = 99999

Now , $\frac{99999}{88}$ = Rem.(31)

So , required no. = 99999 − 31 = 99968

Sol.72.(c) Required number = 78 × 280

Remainder when same no. divided by 65

$$= \frac{78 \times 280}{65} = \frac{13 \times 6 \times 5 \times 56}{65}$$

$$= \frac{65 \times 6 \times 5\,6}{65} = \text{Remainder} = 0$$

Sol.73.(c) Divisibility of 9 :- sum of the digits should be divisible by 9.

as its sum of digits

= 1 + 3 + 0 + 5 + 9 =18

which is divisible by 9.

Clearly , 13059 is divisible by 9.

Sol.74.(b) Divisibility of 6 - number must be divisible by 2 and 3.

Sum of digits = 8 + 0 + 0 + 5 + 5 + 2 = 20

As its sum of digits is not divisible by 3 so, 800552 is not divisible by 6.

Sol.75.(c) 11368 = (1 + 3 + 8) - (1 + 6) = 5,

12638 = (1 + 6 + 8) - (2 + 3) = 10

11863 = (1 + 8 + 3) - (1 + 6) = 5

11638 = (1 + 6 + 8) - (1 + 3) = **11**

Clearly, 11638 is divisible by 11.

Sol.76.(c) **Divisibility of 12 :** The given number must be divisible by 4 and 3.

Divisibility of 4 : The last 2 digits of the given number must be divisible by 4.

Divisibility of 3 : The sum of all the digits of the given number must be divisible by 3.

In 5409844 : (5 + 4 + 0 + 9 + 8 + 4 + 4)

= 34 [not divisible by 3]

In 4298123 : [not divisible by 4]

In 4512984 : (4 + 5 + 1 + 2+ 9 + 8 + 4)

= 33 [divisible by 3 and 4]

In 3215678 : (3 + 2 + 1 + 5+ 6 + 7 + 8)

= 32 [not divisible by 3]

It is clear that **4512984** is the number that is divisible by 3 and 4.

Sol.77.(a) Remainder = 96 ….(given)

Divisor = 9 × 96 = 864

Quotient = $\frac{864}{12}$ = 72

Dividend = divisor × quotient + remainder

Dividend = 864 × 72 + 96 = 62304

Sol.78.(b) **Divisibility of 3 :-** sum of digits should always be divisible by 3.

Sol.79.(c) Prime numbers between 23 and 43 = (29,31,37,41)

Then, Composite numbers between 23 and 43 = (19 - 4) = 15

Sol.80.(a) Let the number be N.

N = 221k + 30 = 13 × 17 k + 30

Multiple of 13 , will always be divisible by 13.

Rem.(13 ×17 k + 30) = Rem.$\left(\frac{30}{13}\right)$ = Rem. 4

Sol.81.(d) **Concepts :-**

$$\text{Remainder}\left(\frac{(x-1)^n}{x}\right) = (-1)^n$$

$$\text{Rem.}\left(\frac{(27^{27}+27)}{28}\right) = \text{Rem.}\left(\frac{(-1)^{27}+27}{28}\right)$$

$$= \frac{-1+27}{28} = 26$$

Sol.82.(d)

Prime factorization of 196 = 4 × (7^2)

So, the no. of factors which are divisible by 4 = 2 + 1 = 3

Sol.83.(d) As we know, that sum of two odd numbers gives an even no and two even no. also gives an even no.

Putting x = 2 which is the only even prime no,

we have y + z = 70 - 2 = 68

The possible value of y and z is (7, 61) and (31, 37)

So, the value of Z = 61 or 37

Checking the options, we get Z = 37. Hence, the correct option is (d).

Sol.84.(a) As we know, co-prime no's are pairs of no's that have only one common factor that is 1.

From the given option, we get 22 and 24 have two common factors. So, it is not a coprime no.

Sol.85.(a) Total number = $\frac{200-100}{7}$

So, divisor(no of multiple of 7) = 14

Sol.86.(b) 70 = 7 × 10

For 732XY to be divisible by 70. We have to check the divisibility of 10. So, for this unit digit i.e.Y should be 0.

Again, for 732X0 to be divisible by 7 . we

have X = 2 or 9 but to get the minimum value we have to take X = 2.

Now, the minimum value of $\frac{X+Y}{2}$

$= \frac{2+0}{2} = \frac{2}{2} = 1$

Sol.87.(d) On dividing 5 by 6 we get R = 5 or -1.

For ease of calculation we use R = -1.

$R_1 = \frac{5^{16}}{6} = \frac{(-1)^{16}}{6}$, $R_1 = 1$

Again, $R_2 = \frac{5^{25}}{6} = \frac{(-1)^{25}}{6} = -1$

so that $\Rightarrow R_2 = 6 - 1 = 5$

Now, $\frac{R_1 + R_2}{R_2} = \frac{1+5}{5} = \frac{6}{5}$.

Sol.88.(a) If a number is divisible by 3 then its sum should also be divisible by 3

5 + 3 + 0 + 6 + P + 2 = 16 + P

Least value = P =2 as 16+ 2 = 18(divisible by 3)

Maximum value P = 8 as 16 + 8

= 24 (divisible by 3)

Difference in Square = 64 - 4 = 60

Sol.89.(a) Let the number is N and x is the quotient when N is divided by 14.

N = 14x + 9

When square of (14x + 9) is divided by 14

$\frac{(14x+9)^2}{14} = \frac{81}{14}$ (by remainder theorem) We get remainder 11

Sol.90.(a) As per the options the difference between all the two values of the given four options is '2'

Thus, in such cases : if there is the same difference between the numbers then, The greatest value with the square root of the given options fetches the smallest value. So √401 - √399 will give the smallest value.

Sol.91.(b) Let the quotient be x.

So, n = 8x + 3

6n-1 = 6(8x + 3) - 1= 48x + 17

48 is multiple of 8 so 48 will be exactly divisible by 8. But when we divide 17 by 8 the remainder is 1.

Short-trick : choose the smallest value of n for which remainder is 3 when the number is divided by 8. ⇒ Let n = 11

6n-1 = 6(11) - 1 = 65

Remainder when 65 is divided by 8 = 1

Sol.92.(b) Number 15x1y2 is divisible by 44, clearly it will also be divisible by 11 and 4 .

A number to be divisible by 11

(1 + x + y) - (5 + 1 + 2) = 0 or 11

For the difference = 0 ⇒ x + y = 7

For the difference = 11 ⇒ x + y = 18

But 18 is not given in the options so option b is the right answer.

Sol.93.(a) Required number = Divisor × Quotient + Remainder

= 38 × 24 + 13 = 925

Sol.94.(d) Difference between the largest and the smallest number

9652 - 2569 = 7083

Sol.95.(d)

ATQ, the fourth statement is true.

For divisibility of 4,

Last two digits should be divisible by 4

Sol.96.(d) 705.0, 7.005, 7.500, 70.50, 7050, 7.050, 75

On arranging in ascending order,

7.005, 7.050, 7.500, 70.50, 75, 705.0,7050

Sol.97.(b) We know that $n^0 = 1$ (where n = natural number)

$(11^0 + 21^0 - 7^0 + 3^0) \times 5^0$

= (1 + 1 - 1 + 1) × 1 = 2

Sol.98.(c) Let the number be x .

$5x = 65 \Rightarrow x = 13$,

Required number = 13

Sol.99.(b) Prime numbers between 51 and 100 are 53 , 59 , 61 , 67 , 71 , ... 97

Sum of the smallest and the greatest prime numbers = 53 + 97 = 150

Sol.100.(a)

13.5 kg of grapes cost ₹681.75

1 kg of grapes cost = $\frac{681.75}{13.5}$

12 kg of grapes cost

= ₹ $\frac{681.75}{13.5} \times 12 = ₹606$

Sol.101.(c) Smallest prime number = 2 , greatest prime number = 7

Difference between the largest and the smallest single-digit prime numbers

= 7 - 2 = 5

Sol.102.(c) $\frac{7}{5} + \frac{5}{9} = \frac{63+25}{45} = \frac{88}{45}$

Reciprocal of $\frac{88}{45}$ $is = \frac{45}{88}$

Sol.103.(a) $27\frac{3}{4} = \frac{111}{4}$, Remainder = 3

Sol.104.(b) $5.\overline{6} = \frac{56-5}{90} = \frac{51}{90}$

Sol.105.(c) $(I^2 - C^2 \times \frac{P}{R}) + 8$

= $(9^2 - 3^2 \times \frac{16}{18}) + 8$

= (81 - 9 × $\frac{16}{18}$) + 8 = 81

Sol.106.(b)

First 5 whole number = 0, 1, 2, 3, 4

The product of first five whole numbers = 0

Sol.107.(a) $\frac{Boys}{total\ students} = \frac{58}{100} = 0.58$

Sol.108.(b) Let the number = x

A/Q, $\frac{4x}{5} - \frac{3x}{4} = 4 = \frac{16x-15x}{20} = 4$

= $\frac{x}{20} = 4 \Rightarrow x = 80$

Sol.109.(a) 120 = $2^3 \times 3 \times 5$

Number of factors = $(3 + 1) \times (1 + 1) \times (1 + 1) = 4 \times 2 \times 2 = 16$

Sol.110.(c) 2, 3 , 5, 7 , 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47 are the prime numbers that are less than 50.

Sol.111.(a) $\frac{3}{8} = 0.375$ i.e. the decimal expression of $\frac{3}{8}$ comes to an end after 3 digits, after the decimal.

Sol.112.(d) On comparing all, the greatest rational number = $\frac{19}{27}$

So this will be the greatest ratio.

Sol.113.(a) 1.112123123412345 is an irrational number because 1234 is repeating after decimal.

Sol.114.(d) Let the four consecutive odd numbers are x, x + 2, x + 4, x + 6 ;

So, the sum of these four consecutive odd numbers is :

x + x + 2 + x + 4 + x + 6 = 160

4x + 12 = 160 ⇒ x = 37

Sol.115.(d) Odd numbers from 3 to 60, that are exactly divisible by 5 are : 5, 15, 25, 35, 45, 55 i.e. 6 numbers.

Sol.116.(b) The given numbers are

$\sqrt{3^2 + 4^2}$, $\sqrt{12.96}$, $\sqrt{125}$ and $\sqrt{900}$

Here, $\sqrt{3^2 + 4^2} = 5$ $\sqrt{12.96} = 3.6$

$\sqrt{125} = 5\sqrt{5}$, $\sqrt{900} = 30$

So, the only irrational (not rational) number is $\sqrt{125} = 5\sqrt{5}$

Sol.117.(b) A + 0 = 0 + A = A

This is the additive property of zero.

Sol.118.(a) In 978648, we have

(8 + 6 + 7) – (4 + 8 + 9) = 0.

Hence, 978648 is completely divisible by 11.

Sol.119.(c) Let the denominator of a rational number is x and numerator will be x - 4

According to question,

$\frac{(x-4)+15}{x-4} = 6$ = x + 11 = 6x - 24

= 5x = 35 ⇒ x = 7

Therefore required fraction is $\frac{3}{7}$

Sol.120.(b) According to question,

Unit digit of $(67)^{25}$ = Unit digit of $(7)^{25}$.

Unit digit of $(7)^4$ is 1 and so the unit digit of $(7)^{4\times6}$ is 1.

∴ Unit digit of $(7)^{25}$= (1 × 7) = 7.

Therefore unit digit of $(67)^{25}$ - 1 = 7 - 1 = 6

Sol.121.(c) According to question,

$(\frac{2}{3})x = (\frac{25}{216}) \times (\frac{1}{x})$

$x^2 = \frac{25\times3}{216\times2} = \frac{25}{144} \Rightarrow x = \frac{5}{12}$

Sol.122.(b) Difference between the local value (place value)and the face value of 5 in the given question

= (5000 – 5) = 4995.

Sol.123.(b) Required difference

= (100000 – 9999) = 90001.

Sol.124.(d) Let the number be x.

According to question, $x^2 - (72)^2 = 6052$

$x = \sqrt{6052 + (72)^2}$

$x = \sqrt{6052 + 5184}$

$x = \sqrt{11236} \Rightarrow x = 106$

Sol.125.(b) Let first number is x and second number is y

According to question,

25% of x = 2 × 65% × y

$\frac{x}{4} = \frac{26y}{20} \Rightarrow \frac{x}{y} = \frac{26}{5}$

Therefore required ratio = 5 : 26

Sol.126.(b) Let the number is x

According to question,

$x - 24 = \frac{2}{3}x = \frac{x}{3} = 24 \Rightarrow x = 72$

Therefore required number is = $\frac{72}{9} = 8$

Sol.127.(a)

$2^6 \times 3^4 \times 5^5 = (2\times5)^5 \times 2 \times 3^4 = 16200000$

So, $S(2^6 \times 3^4 \times 5^5) = S(16200000) = 9$

Sol.128.(c)

Let numerator of the fraction be x

According to the question,

Fraction will be = $\frac{x}{2x+4}$

Now, both numerator and denominator are decreased by 6

Then, new fraction = $\frac{x-6}{2x-2}$

Now, according to the question,

$2x - 2 = 12 \times (x - 6)$

$10x = 70$, $x = 7$

Hence, fraction = $\frac{7}{2\times7+4} = \frac{7}{18}$

Sol.129.(d) Let number be x

According to the question,

$x = \frac{x}{3} + 124 \Rightarrow 3x = x + 372$

$x = \frac{372}{2} = 186$

Sol.130.(a) Let correct questions be x and incorrect questions be $(25 - x)$

Then, according to the question,

$4x - 1(25 - x) = 74$

$5x = 99 \Rightarrow x = \frac{99}{5} = 19.8$

Value of x cannot be in fraction so, x = 19

So, correct questions = 19

Marks for 19 correct questions

= 4 × 19 = 76

But he got 74 marks ,

It means he done 2 questions wrong

Hence, number of unattempted questions = 25 - (19 + 2) = 4

Sol.131.(d) $4^{61}(4^0 + 4^1 + 4^2 + 4^3)$

$4^{61}(1 + 4 + 16 + 64)$

$4^{61}(85) = 4^{61} \times 17 \times 5$

Hence,

$4^{61} + 4^{62} + 4^{63} + 4^{64}$ is divisible by 17

Sol.132.(b) By checking all the options one by one we get the correct option is (b)

48 - 24 = 24 (satisfied)

48 = 24 **× 2**

Sol.133.(b) Let , the number be x ,

Then $52x - 25x = 324$

Number $(x) = \frac{324}{27} = 12$

Sol.134.(d) Let the larger and smaller no be a and b respectively

ATQ, a + b = 15 ---------- (1)

$a^2 - b^2 = 15 \Rightarrow (a - b)(a + b) = 15$

(a - b)15 = 15 (from(1))

a - b = 1 --------- (2)

Adding eqn (1) and (2) we have :

$a = \frac{15+1}{2} = \frac{16}{2} = 8$ and b = 7

So, 8 will be the answer.

Sol.135.(a)

$(\frac{1}{6})^{12} \times 8^{25} \times (\frac{3}{4})^{15} = 2^{-12} \times 3^{-12} \times 2^{75}$

$\times 3^{15} \times 2^{-30} = 2^{33} \times 3^3$

The number of prime factors of given expression = 33 + 3 = 36

Sol.136.(a) In this type of question, we will check by putting options one by one and doing so option (a) gets satisfied.

Putting x = 2 in 97468x4, we get 9746824.

For any numeric expression to be divisible by 8, if last three digits must be divisible by 8.

In a given expression, the last three digits that is 824 is divisible by 8, hence, x = 2.

Sol.137.(b)

$\frac{961^{125}}{37} = \frac{(962-1)^{125}}{37} = \frac{\{(37\times26)-1\}^{125}}{37}$

Now,Rem.$\frac{\{(37\times26)-1\}^{125}}{37} = (-1)^{125} = -1$

So , remainder = 37 – 1 = 36

Sol.138.(a) For every natural number n, n(n + 5) is always an even number.

Sol.139.(c) Let the quotient be 1

Dividend = 119 × 1 + 19 = 138

Again, when 138 is divided by 17 , we get 2 as remainder

Sol.140.(a) Let the larger number and smaller number be x and y.

According to the question,

x - y = 2507 .....(1)

9y + 11 = x .....(2)

Putting value of x from (2) in (1), we get

9y + 11 - y = 2507 ⇒ 8y = 2496 ⇒ y = 312

So, larger number x = 9y + 11 = 9(312) + 11 = 2808 + 11 = 2819

Sol.141.(b) Length of rope = 37.5 metre

1 m rope cutted into 8 pieces

So, 37.5 metre rope cutted into

37.5 × 8 = 300 pieces

Sol.142.(a) Let the number be N.

N = 221k + 30 = 13 × 17 k + 30

Multiple of 13 , will always be divisible by 13.

Rem.(13 × 17 k + 30) = Rem.$(\frac{30}{13})$ = Rem.4

Sol.143.(c) Let the original no. be x

ATQ, $\{\frac{(x+7)\times5}{3}\}$ - 4 = 16

$= \frac{(x+7)\times5}{3} = 20 \Rightarrow \frac{x+7}{3} = 4$

= x + 7 = 12 ⇒ x = 12 - 7 = 5

Sol.144.(a) According to the question,

Factors of 48 = 2 × 2 × 2 × 2 × 3 ⇒ $2^4 \times 3^1$

Prime factors of 48 = 2 and 3 in which even prime factors is only 2.

So the number of even prime factors in the factorization of 48 is 1.

Sol.145.(a) According to question,

Unit digit of $(4367)^{245} = \frac{245}{4}$

Remainder = 1 ,Unit digit will be 7.

Sol.146.(c) Smallest 4 digit number divisible by 11

= 11 × 91 = 1001

Smallest 4 digit number divisible by 13

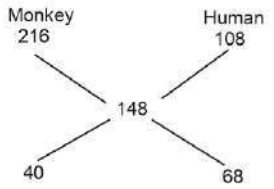
= 13 × 77 = 1001

According to the question,

2 × 2 = 4

Sol.147.(d)
To divide any number by 24; The given number must be divided by 2, 3 and 4.
14744
→ Sum of digits = 20 ...can't divisible by 3
28856 → Sum of digits = 29 ..... can't divisible by 3
43976 → Sum of digits = 29 ..... can't divisible by 3
57528 → Sum of digits = 27 ..... divisible by 3, 2 and 4
So, 57528 must be divisible by 24.

Sol.148.(a)



So, the ratio of the no of monkey and human = 40 : 68 = 10 : 17
10 + 17 = 27 unit ---------- 54
10 unit ---------- $\frac{54}{27} \times 10 = 20$

Sol.149.(a) 24 = 8 × 3
For 11p9q4 to be divisible by 8, its last 3 digits i.e. 9q4 should be divisible by 8
Then, the possible values of q are 4, 8. But for the greatest value , q should be 8.
For 11p9**8**4 to be divisible by 3, the sum of its digits i.e. 1+1+p + 9 + **8** + 4 = 23 + p should be divisible by 3.
For greatest value, p should be 7
Hence, pq = 7 × 8 = 56

Sol.150.(d)
620x976y52 is divisible by 88 (8 × 11)
Divisibility of 8 = last three digit of the number must be divisible by 8
Divisibility of 11 = difference of sum of odd and even places of the number is 0 or multiple of 11
Now, in the given number y52 is must be divisible by 8
So, for least value, y = 1
Again , checking divisibility of 11
(6 + 0 + 9 + 6 + 5) − (2 + x + 7 + y + 2) = 0 or multiple of 11
26 − (11 + x + 1) = 0 or multiple of 11
14 − x = 11 ⇒ x = 3
Hence, $(x^2 + y^2) = 9 + 1 = 10$

Sol.151.(d) Sum of digits should be divisible by 3 not by 9 .
3 + 2 + a + 7 + 8 + b = 20 + a + b
For greatest number , a should by maximum.
Max. possible value for (a + b) = 13
So , a = 9 and b = 4
Required no. = 329784

Sol.152.(d) $\frac{n}{7}$ = Rem.(2)
$\frac{9n}{7}$ = Rem.$\frac{9 \times 2}{7}$ = Rem.(4)

Sol.153.(d) Remainder when sum of these numbers are divided by same divisor = 57 + 57 = 114
According to the question ,
$\frac{114}{divisor}$ = Rem.(49)
Required divisor = (114) − 49 = 65

Sol.154.(d)
Divisor = 5 × Remainder = 5 × 44 = 220
Quotient = $\frac{220}{11}$ = 20
Dividend = 220 × 20 + 44 = 4444

Sol.155.(d) If , $\frac{N}{7}$ = Rem. (1)
Then ,
$\frac{(N)^3}{7}$ = Remainder will be = $\frac{(1)^3}{7}$ = 1

Sol.156.(d)
Co - prime factor of 88 = (8 and 11)
Least value of y , when $y24$ divisible by 8 :- y = 0
Now ,
checking divisibility of 11 :- 780x533024
= (7 + 0 + 5 + 3 + 2) − (8 + x + 3 + 0 + 4)
= 17 − (15 + x) = 0 ⇒ 2−x = 0 ⇒ x = 2
Now , value of $(x + y)$ = 2 + 0 = 2

Sol.157.(a) $\frac{8^8 + 6}{7}$ = Rem. $\frac{(+1)^8 + 6}{7}$
= Rem. $\frac{1 + 6}{7}$ Remainder = 0

Sol.158.(a) Given numbers are 34936, 35508, 35580 and 36508 For a number divisible by 33 , it should be divisible by 3 and 11. On checking the divisibility one by one , we found that 35508 is divisible by 3 and 11, so it is also divisible by 33.

Sol.159.(d)
Dividend = Divisor × Quotient + Remainder
According to question,
Divisor = $\frac{18935 - 65}{102}$ = 185

Sol.160.(c) In this type of question go through option (c) get satisfied
(103 + 5) = 108 , is divisible by 2 and 3

Sol.161.(c) Two digit even numbers = 10, 12, 14.....98
Sum = $\frac{n}{2}(a + l)$
Where a = first term and l = last term
No of terms = ($\frac{98 - 10}{2}$ + 1) = 45
Therefore,
their sum = $\frac{45}{2}(98 + 10)$ = 2430

Sol.162.(a) $3^{50} + 9^{26} + 27^{18} + 9^{28} + 9^{29}$
$= 3^{50} + 3^{52} + 3^{54} + 3^{56} + 3^{58}$
$= 3^{50}(1 + 9 + 81 + 729 + 6561)$
$= 3^{50}(7381) \Rightarrow 3^{50}(11 \times 11 \times 61)$
Clearly , it is divisible by 11

Sol.163.(b) Nearest number which is greater to 87501 and is completely divisible by 765 is :- 765 × 115 = 87975
Short Tricks:-
In this type of question make factor of 765 = 5 × 3 × 3 × 17
And now , check the option which is divisible by 3 , 5 and 17 .
Clearly , 87975 is clearly divisible by 3 , 5 and 17 .

Sol.164.(a) Sum of first 78 natural no
= $\frac{78\,(78 + 1)}{2}$ = 39 × 79
On checking the options we get the given no i.e. 39 × 79 is divisible by 79

Sol.165.(b) For greatest number take a = 9 and b = 9
23**9**68**9** , now for making it divisible by 3 but not by 9 we will change the value of b , 2 + 3 + 9 + 6 + 8 + 9 = 37
37 - 1 = 36 (divisible by both 9 and 3)
37 - 4 = 33 (divisible by 3 but not by 9)
So b = 9 - 4 = 5
Required number = 239685

Sol.166.(d) Let the number be x,
After increasing by 20% we get $\frac{6x}{5}$
According to the question,
$\frac{\frac{6x}{5} - \frac{5}{6x}}{x - \frac{1}{x}} = \frac{175}{144}$,
Checking options one by one we get,
x = 5 satisfies this.

Sol.167.(c) 4a067b
Sum of odd placed digits = 4 + 0 + 7
Sum of even placed digits = a + 6 + b
So, 11 - (6 + a + b) = 0 or multiple of 11
a + b = 5 or 16
So the sum all the possible values of (a + b) = 5 + 16 = 21

Sol.168.(c) Q is the quotient when number is divided by 3
Number = 3Q + 2
Let, x is the quotient when Q is divided by 7
Q = 7x + 5
Number = 21x + 17
When number is divided by 21, Remainder = 17

Sol.169.(d) The whole number which divides $2^{20} + 1$ also divides the multiple of $2^{20} + 1 \Rightarrow 2^{60} + 1 = (2^{20} + 1)(2^{40} + 1 - 2^{20})$
Using formula :
$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

$2^{60}+1$ is the multiple of $2^{20}+1$
so,2^{60} + 1 is completely divisible by that whole number.

Sol.170.(b)
Now, we know that the number that is divisible by 7, 11 and 13 is 1001
if 1001 is multiplied with a three digit number say, 'abc' then
the product comes out to be abcabc
x = 4 , y = 7, z = 9
Putting these values in the equation
{(y + z) ÷ x } = {(7 + 9) ÷ 4 } = 16 ÷ 4 = 4

Sol.171.(b) 12 = 2 × 2 × 3 ;16 = 2 × 2 × 2 × 2
18 = 2 × 3 × 3; 20 = 2 × 2 × 5
25 = 5 × 5
LCM of 12,16,18,20 and 25 = 2 × 2 × 2 × 2 × 3 × 3 × 5 × 5 = 3600
$= x\,must\,be\; =\; 3600k\; +\; 4$
Where 3600k + 4 is multiple of 7
The condition gets satisfied when k=5
Required number = 3600(5) + 4 = 18004
$=\; digit\; at\; the\; thousands'\; place\; in\; x\; =\; 8$

Sol.172.(b) If a number 'a' and a number 'b' are divisible by a number 'n' then, a + b and a-b are also divisible by n.
Here the numbers are 7531, 7105 and 6892
the required number then becomes H.C.F of 7531 - y, 6892 - y and 7105 - y or the HCF of (7531 - y) - (7105 - y) and (7105 - y) - (6892 - y)
(7531 - y) - (7105 - y) = 426
(7105 - y) - (6892 - y) = 213
213 = 3 × 71 ⇒ 426 = 2 × 3 × 71
So, HCF of 426 and 213 = x
= 3 × 71 = 213
The remainder = $\frac{7531}{213}$ = $\frac{7105}{213}$ = $\frac{6892}{213}$
= y = 76 ⇒ $(x\; -\; y)\; =\; 213\; -\; 76\; =\; 137$

Sol.173.(b) By observing options,
x + y =11 + 7 = 18 ⇒ xy = 11 × 7 = 77
Therefore option (b) is the right answer.

Sol.174.(b) A × B = 143 = 11 × 13
Let A = 11 So , B = 13 ,
B × C = 195 So, C = 15
11 , 13 and 15 are co- prime to each other The sum = 11 + 13 + 15 = 39

Sol.175.(a) Three digit numbers are 100 , 101 .....998 , 999
total numbers divisible by 2 = 450 = n(2)
total numbers divisible by 5 = 180 = n(5)
total numbers divisible by both 2 and 5 = 90 = n(2 and 5)
The total numbers of three-digit numbers divisible by 2 or 5 = n(2 or 5)
= n(2) + n(5) - n(2 and 5)
The total number of three-digit numbers divisible by 2 or 5 = 450 + 180 - 90 = 540

Sol.176.(a) Difference = 335 - 265 = 70
According to the question,
Quotient = 70 × 3 = 210 ,Divisor = 335 + 265 = 600 ,remainder = 35
We know that, Dividend
= quotient × divisor + remainder
Therefore, Number
= 210 × 600 + 35 = 126035

Sol.177.(b)
947 + 1218 = 2165
861 + 1304 = 2165
787 + 1378 = 2165
NOTE :- During exam, Just check the unit digit and eliminate the options.

Sol.178.(a) LCM of 7, 11 and 13 = 1001
$(1001)^2$ = 1002001
So, option (a) is divisible by 7, 11 and 13.

Sol.179.(c) Rational numbers can be both positive and negative ;
So, the negative of a non-zero rational number is also a rational number.

Sol.180.(b)
If P is a prime number and P divides Q^2, then P will also divide Q
So P will not divide the next number after Q
So Q + 1 is not divisible by P.

Sol.181.(d) Let the numbers are x and y
A/Q, $\frac{x}{3}+\frac{y}{2}=\;\;8$
$2x\; +\; 3y\; =\; 48$___(1)
And $\frac{x}{5}+\frac{y}{6}\;=\;4$
$6x\; +\; 5y\; =\; 120$____(2)
On solving equation (1) and (2), we get
x = 15 or y = 6

Sol.182.(d) Here, x is an even number.
Let , numbers are = x ,(x + 2) , (x + 4) ,(x + 6) ,(x + 8)
A/Q , x + (x + 2) + (x + 4) + (x + 6) + (x + 8) = 660,
5x + 20 = 660 ⇒ x = 128
Therefore , the number will be -- 128 , 130 , 132 , 134 and 136
Greatest number = 136 and smallest number = 128

Sol.183.(d) The difference between the biggest and the smallest fraction
= $\frac{5}{6}$ - $\frac{2}{3}$, = $\frac{1}{6}$

Sol.184.(d) LCM of (21, 35, 63) = 315
Number should be divisible by 315
Now, $\frac{10000}{315}\; =\; 31(Quotient)$

Sol.185.(d) (2^{25} + 2^{26} + 2^{27} + 2^{28})
= 2^{25} (1 + 2^1+ 2^2+ 2^3)
= 2^{25} (1 + 2 + 4 + 8) = 2^{25} (15)
Therefore, (2^{25} + 2^{26} + 2^{27} + 2^{28}) is the multiple of 15.

Sol.186.(a) Prime no. between 50 and 100 = 53 , 59 , 61 , 67 , 71 , 73 , 79 , 83 , 89 ,97.
Not any pairs of prime numbers are there that add up to a prime number.

Sol.187.(d) Since 69 is split into 3 parts such that they form an AP
Let three no's be a-d, a, a+d
According to question,
a + (a - d) + (a + d) = 69
3a = 69 ⇒ a = 23
Also, a(a-d) = 483
23(23 - d) = 483 ⇒ 529 - 23d = 483
23d = 529 - 483 = 46 ⇒ d = $\frac{46}{23}$ = 2
So, the numbers are 23 - 2 = 21,
23 and 23 + 2 = 25

Sol.188.(b) Let the second number is x and the first number is 2x and the third number is $\frac{2x}{3}$
According to question,
2x + x + $\frac{2x}{3}$ = 264
6x + 3x + 2x = 264 × 3
11x = 792 ⇒ x = 72
Therefore required number is = 72

Sol.189.(c) Lets the digit at tens and ones place be 3x and 2x
So, original number = 3x × 10 + 2x
After interchanging number will be
= 2x × 10 + 3x
According to question
[3x × 10 + 2x] - [2x × 10 + 3x] = 27
9x = 27 ⇒ x = 3
So, original number = 3x × 10 + 2x = 96

Sol.190.(a)
Let the two digit number = 10x + y
According to question,
(10y + x) - (10x + y) = 18 ⇒ 9y - 9x = 18
y - x = 2 ------ eq .(1)
y + x = 8 ----- eq .(2)
Solving the equation (1) and (2)
y = 5 and x = 3
So , required number is 35

Sol.191.(d) Let the larger and smaller numbers are x and y respectively. Then,
According to the question,
x × y = 9375 —— eq .(1)
$\frac{x}{y}$ = 15 ————eq .(2)
Now, dividing equation (1)by equation (2)
= xy ÷ $\frac{x}{y}$ = 9375 ÷ 15 ⇒ y^2 = 625 ⇒ y = 25
Therefore x = 375
∴ Sum of the numbers = 375 + 25 = 400

Sol.192.(c) Let the Ten's digit be x and the one's digit be y .
According to question,

10x + y = 3(x + y)
= 7x - 2y = 0 -----eq .(1)
10x + y + 45 = 10y + x
= y - x = 5 ---- eq .(2)
From equation (1) and (2) we get x = 2 an y = 7.
∴ Required number = 10x + y = 27.

Sol.193.(c) **Concepts :-** {In $(a^n - b^n)$, if n is even number it is divisible by both (a + b) and (a - b)}.
$(49^{15} - 1) = ((7^2)^{15} - 1) = (7^{30} - 1)$
Here , the given term $(7^{30} - 1)$ must be divisible by both (7 + 1) and (7 - 1)
Clearly from given options it is divisible by 8.

Sol.194.(c) If n is a whole number then n will be 2 , 3 , 4 , 5, -------
According to question ,
$n^2(n^2 - 1) = n^2(n - 1)(n + 1)$
Put the value of n = 2
$n^2(n - 1)(n + 1)$
$= 2^2(2 - 1)(2 + 1)$ 4 × 1 × 3 = 12
So, $n^2(n^2 - 1)$ is always divisible by 12

Sol.195.(a) Divisibility rule of $(a^n + b^n)$
If n is an odd number, then $(a^n + b^n)$ is divisible by (a + b)
$31^{47} + 43^{47}$ is divisible by (31 + 43) = 74
So, $31^{47} + 43^{47}$ is divided by 37, the remainder is 0

Sol.196.(a) $x_1 = -1$
$x_{1+1} = x_2 = x_1 + 1 - 1 \Rightarrow x_1 + 0$
$x_{2+1} = x_3 = x_2 + 2 - 1 \Rightarrow x_2 + 1$
Similarly,
$x_{100} = x_{99+1} = x_{99} + 99 - 1 = x_{99} + 98$
Adding LHS and RHS, we have ;
$x_1 + x_2 + x_3 + ...x_{100}$
= (-1 + 0 + 1 + 2 + 3.....98) + ($x_1 + x_2 + x_3 +$ .....x_{99})
$x_{100} = -1 + \left(\frac{98 \times 99}{2}\right) = -1 + 4851 = 4850$

Sol.197.(a) Pattern follows here as ;
1st group ends with 1^2
2nd group ends with 2^2
3rd group ends with 3^2
Similarly, 14th group ends with $14^2 = 196$
and 15th group ends with $15^2 = 225$
Numbers in the 15th group = (197, 198, 199, 200 .....225)
Required sum = $\frac{29}{2}$ (197 + 225)
$= \frac{29}{2} \times 422 = 6119$

Sol.198.(d) If x and x^2 have only 1 and x as their common factors, x must be a prime number.

Sol.199.(b) Let the no. be xyz
On reversing it, we get zyx
ATQ,
(100z + 10y + x) - (100x + 10y + z) = 99
99z - 99x = 99 ⇒ z - x = 1
It is given that,
y = x + z and x + y + z = 10
then, 2y = 10 ⇒ y = 5
Now, x + z = 5 and z - x = 1
so, we get z = 3 , x = 2
Required no ⇒ xyz = 253

Sol.200.(c) Let original three digit number is $100x + 10y + z$
After reversing the digits
New number = $100z + 10y + x$
According to the question,
$(100x + 10y + z) -$
$(100z + 10y + x) = 396$
$99(x - z) = 396 \Rightarrow (x - z) = 4$
Possible values of $(x - z)$ = (9 - 5) ,
(8 - 4) , (7 - 3) , (6 - 2) , (5 - 1) , (4 - 0)
= 6 values
When, we take the value(4 - 0) for the required numbers
It doesn't make three digit number
So, possible values for three digit number of $(x - z)$ = 5 values
and Possible values of y
= 0,1,2,3,4,5,6,7,8,9
So, possible three digit numbers are
= 5 × 10 = 50

Sol.201.(c) Numbers → $(2^{35} - 1)$, $(2^{91} - 1)$
HCF of $(a^m - 1)$ and $(a^n - 1)$ is $[(a^{HCF(m,n)} - 1)]$
Then, HCF of numbers
$= \{2^{HCF(35,91)} - 1\} = \{2^7 - 1\}$
= 128 − 1 = 127
Hence, largest number which divides the both numbers = 127

Sol.202.(b)
Let, the original number = $10x + y$
According to the question,
$10y + x = 10x + y + 18$
$9(y - x) = 18$
Difference of digits $(y - x) = \frac{18}{9} = 2$

Sol.203.(c) Factor of 360 = $2^3 \times 3^2 \times 5$
Case 1. Number of factors of 360
= (3 + 1)(2 + 1)(1 + 1) = 24
Case 2. Prime factor of 360
= $2^3 \times 3^2 \times 5^1$
Then, Sum of factors = $(2^0 + 2^1 + 2^2 + 2^3)(3^0 + 3^1 + 3^2)(5^0 + 5^1)$
$= (1 + 2 + 4 + 8)(1 + 3 + 9)(1 + 5)$
= 15 × 13 × 6 = 1170
Hence, both cases 1 and 2 are true

Sol.204.(b) For any number to be divisible by 5, we should have 0/5 in its unit place but here it is clearly said that each digit should be odd no, so, we have 5 in the unit place . Now, we have two places remaining. So, the required no of possible 3-digit formed as per the directions given in the question is 4 × 3 = 12

Sol.205.(a) According to the question,
$\frac{85 \times 87 \times 89 \times 91 \times 95 \times 96}{100}$
$= \frac{15 \times 13 \times 11 \times 9 \times 5 \times 4}{100}$
$= \frac{195 \times 99 \times 20}{100} = \frac{386{,}000}{100}$ = 0 rem.

Sol.206.(c) 72 = 8 × 9
For 89563x87y to be divisible by 8, the last three digits i.e. 87y must be divisible by 8.
For this , we have y = 2
Now, For 89563x872 to be divisible by 9 . the sum of the digits i.e. 8 + 9 + 5 + 6 + 3 + x + 8 + 7 + 2 = 48 + x must be divisible by 9. So, we have x = 6
Therefore, the value of
$\sqrt{7x - 3y} = \sqrt{7 \times 6 - 3 \times 2}$
$= \sqrt{42 - 6} = \sqrt{36} = 6$

Sol.207.(d) Let the larger no. = x
And smaller no. = y
According to the question,
$x - y = 3630$
$x = 3630 + y$ .....(1)
Dividend = divisor × quotient + remainder
$x = y \times 30 + 5$
$x = 30y + 5$ .....(2)
on putting the Value of x from equation (1) to equation (2)
$3630 + y = 30y + 5$
(Smaller no.) $y = 125$
(Largest no.) $x = 3630 + 125 = 3755$

Sol.208.(a) Let the 1st no. = $x + 3$
And the 2nd no. = x
According to the question,
$x \times (x + 3) = 378 \Rightarrow x^2 + 3x - 378 = 0$
$\Rightarrow x^2 + 21x - 18x - 378 = 0$
$\Rightarrow x(x + 21) - 18(x + 21) = 0$
$\Rightarrow x = -21, x = 18$
So the value of x = 18
2nd no. = 18 , 1st no. = 18 + 3 = 21
Sum of no. = 18 + 21 = 39

Sol.209.(d) **Given:-** $\frac{9 + 9^2 + ... + 9^{(2n+1)}}{6}$

$\frac{9}{6}$ = Rem 3 , $\frac{9^2}{6}$ = Rem 3 ,
..... $\frac{9^{2n+1}}{6}$ = Rem 3
So, $\frac{3 \times (2n + 1)}{6} = \frac{6n + 3}{6}$ = Rem 3

Sol.210.(b) According to the question,

abba is divisible by 4
Then , last two digit (ba) be divisible by 4 {where a < b}
So, possible values of ba =
(32, 52 , 64 , 72 , 76 , 84 , 92 , 96) = 8

Sol.211.(d)
Ratio :- initial : final
Divisor :- 4 : 5
Dividend :- 10 : 11
Initial quotient = 25
Initial dividend (10 units) = 25 × 4 = 100
Then final dividend (11 units) = 110
Final quotient = $\frac{110}{5}$ = 22

Sol.212.(a) Let A has x no. of toffees and B has y no. of toffees.
According to the question,
Condition 1 :-
$x - 1 = y + 1$
$x = y + 2$ .....e.q .(1)
Condition 2 :-
$x + 1 = 2 \times (y - 1)$
$x - 2y = -3$
$y + 2 - 2y = -3$ (from eq 1)
$y = 5$ and $x = 7$
Total no. of toffees = 5 + 7 = 12

Sol.213.(b) Let the bigger and smaller no be x and y respectively
ATQ, x × $\frac{17}{20}$ = y × $\frac{23}{20}$ ⇒ $\frac{x}{y} = \frac{23}{17}$
and, x + y = 680
(23 + 17) unit = 680
40 unit = 680 ⇒ 1 unit = $\frac{680}{40}$ = 17
So,
the smaller no = 17 unit = 17 × 17 = 289

Sol.214.(b) After arranging the digits in descending order and subtracting 65 from the new no, we get : 853210
= 853210 - 65 = 853145, which is divisible by 5 (∵last digit is 5)

Sol.215.(b) Given series is the combination of two series :
I. $\frac{7}{2} + \frac{7}{6} + \frac{7}{12} + ... \frac{7}{156} = 7\left(\frac{1}{1\times2} + \frac{1}{2\times3} + \frac{1}{3\times4} + ... \frac{1}{12\times13}\right)$
= 7 (1 - $\frac{1}{2}$ + $\frac{1}{2}$ - $\frac{1}{3}$ + $\frac{1}{3}$ - $\frac{1}{4}$ ..... $\frac{1}{12}$ - $\frac{1}{13}$) = 7 (1 - $\frac{1}{13}$) = 7 × $\frac{12}{13}$ = $\frac{84}{13}$
II. $\frac{11}{3} + \frac{11}{15} + ...\frac{11}{575} = \frac{11}{2}\left(\frac{2}{1\times3} + \frac{2}{3\times5} .... \frac{2}{23\times25}\right)$ = $\frac{11}{2}$(1 - $\frac{1}{3}$ + $\frac{1}{3}$ - $\frac{1}{5}$ .... $\frac{1}{23}$ - $\frac{1}{25}$) = $\frac{11}{2}$(1 - $\frac{1}{25}$) = $\frac{11}{2}$ × $\frac{24}{25}$ = $\frac{132}{25}$
So, the required sum = $\frac{84}{13} + \frac{132}{25}$
= $\frac{84\times25 + 132\times13}{325}$ = $\frac{2100 + 1716}{325}$
= $\frac{3816}{325}$

Sol.216.(d) Using remainder theorem,
g(x) = 3x + 2 = 0 ⇒ x = - $\frac{2}{3}$
Putting x = - $\frac{2}{3}$ in f(x)
f(x) = $15x^3 - 14x^2 - 4x + 10$
f(- $\frac{2}{3}$) = 15 × (- $\frac{2}{3}$)^3 - 14×(− $\frac{2}{3}$)^2 - 4 × (- $\frac{2}{3}$) + 10 ⇒ - $\frac{40}{9}$ - $\frac{56}{9}$ + $\frac{8}{3}$ + 10
= - $\frac{72}{9}$ + 10 = - 8 + 10 = 2

Sol.217.(a) 22 = 11 × 2
For 23x45678 to be divisible by 11, difference of the sum of alternate digits. i.e (8 + 6 + 4 +3) - (7 + 5 + x + 2), should be divisible by 11.
= 21 - (14 + x) = 0
= 7 - x = 0 ⇒ x = 7
So, putting x = 7,23745678 , is divisible by 22

Sol.218.(d) For 7x79251y8 to be divisible by 36, the given expression must be divisible by 9 and 4.
For 7x79251y8 to be divisible by 4, the last two digits, that is, y8 must be divisible by 4, if we take y = 8 (largest possible value) then y8 = 88 which is divisible by 4. Hence we got y = 8.
For 7x79251y8 to be divisible by 9, the sum of all digits of the given expression must be divisible by 9.
7x79251y8 = 7x7925188,
7 + x + 7 + 9 + 2 + 5 + 1 + 8 + 8 = 47 + x,
the number greater than and nearest to 47 divisible by 9 is 54.
So, 47 + x = 54.
Hence we got x = 7
$10x^2 - 3y^2 = 10(7)^2 - 3(8)^2$
= 490 − 192 = 298

Sol.219.(a)
As prime numbers have 2 factors Only the squares of prime numbers will have three factors. ⇒ Let r = 9 and s = 4
And q = 49 and p = 25
$\frac{p-q-1}{r-s}$ = $\frac{25-49-1}{9-4}$ = $\frac{-25}{5}$ = - 5
Putting s = 4 in all options we find only option (a) satisfies this value.

Sol.220.(c)
Let the numbers be "a" and "b"
a + b = 65,
$\sqrt{ab}$ = 26 ⇒ ab = 676
$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{65}{676} = \frac{5}{52}$

Sol.221.(d) Let five consecutive odd natural numbers are
(x - 4), (x - 2), x, (x + 2), (x + 4)
$(x-4)^2 + (x-2)^2 + x^2 + (x+2)^2 + (x+4)^2 = 233 \times 5 \Rightarrow 5x^2 + 40 = 1165$
$5x^2$ = 1125 ⇒ x = 15 , Largest number =19
Smallest number = 11 , Average = 15

Sol.222.(d) Let the numbers be x and y.
According to the question
x - y = 2001 ..... (1)
And 9y + 41 = x ..... (2)
Put the value of x in eq (1)
9y + 41 - y = 2001 ⇒ 8y = 1960
y = 245 ⇒ x = 9(245) + 41 = 2246
Required sum = 2 + 2 + 4 + 6 = 14

Sol.223.(d) **Given,**
a + b + c = $\frac{19}{12}$...(1) and $\frac{c}{a} = \frac{9}{2}$
Let c = 9 unit and a = 2 unit
According to the question
b = $\frac{9}{2}$ - $\frac{23}{6}$ = $\frac{2}{3}$
Put this value in eq (1)
= a + c = $\frac{19}{12}$ - $\frac{2}{3}$ = $\frac{11}{12}$
= (9 + 2) unit = $\frac{11}{12}$
= 1 unit = $\frac{1}{12}$
= 9 unit = $\frac{3}{4}$ ⇒ 2 unit = $\frac{1}{6}$
(2a + b - c) = 2($\frac{1}{6}$) + $\frac{2}{3}$ - $\frac{3}{4}$ = $\frac{1}{4}$

Sol.224.(c) 12600 = $p^3 \times q^2 \times r^2 \times s^1$
12600 = $7^1 \times 3^2 \times 2^3 \times 5^2$
P = 2, Q = 3, R = 5, S = 7
$(3p + 2q - r + s)$
= 3(2) + 2(3) - 5 + 7 = 14

Sol.225.(a) 2^2 = 4 and 3^2 = 9
So, total integers between 2^2 and 3^2
= (9 - 4) - 1 = 4 = 3^2 = 9 and 4^2 = 16
So, total integers between 3^2 and 4^2
= (16 - 9) - 1 = 6
Integers lying between 891^2 and 892^2
= (892^2 - 891^2) - 1 = (892 - 891)(892 + 891) - 1 = 1783 - 1 = 1782

Sol.226.(a) $34^2 < 1212 < 35^2$
Smallest number that should be added
= $35^2 - 1212 = 1225 - 1212 = 13$

Sol.227.(d) $\frac{3467860}{19}$, Remainder = 18
So, the number = 3467860 - 18
= 3467842

Sol.228.(c) As we know :
$14^3 < 2750 < 15^3$
So, the least positive integer that should be subtracted from 2750, so that the difference is a perfect cube
= (2750 - 2744) = 6 ;

Sol.229.(b)
Let the prime numbers be a , b and c
According to question,,
ab = 323 ____ (1)
bc = 221 _____(2)
Dividing (1) by (2)
$\frac{a}{c} = \frac{19}{13}$, Greatest number = a = 19

Sol.230.(c) Let the number of pages in the book = x ,Pages read by boy on 1st day = $\frac{3}{8}x$,

Remaining pages = $x - \frac{3x}{8} = \frac{5x}{8}$

Pages read by boy on 2nd day
= $\frac{5x}{8} \times \frac{4}{5} = \frac{x}{2}$

Total pages read by boy = $\frac{3x}{8} + \frac{x}{2} = \frac{7x}{8}$

A/Q, $x - \frac{7x}{8} = 45 \Rightarrow \frac{x}{8} = 45$

$\Rightarrow x = 360$

Sol.231.(d) Sum of 20th term of the series

$\frac{1}{5\times6} + \frac{1}{6\times7} + \frac{1}{7\times8} + ... + \frac{1}{24\times25}$

$= \frac{1}{5} - \frac{1}{6} + \frac{1}{6} - \frac{1}{7} + ... + \frac{1}{24} - \frac{1}{25}$

$= \frac{1}{5} - \frac{1}{25} = \frac{5-1}{25} = \frac{4}{25} = 0.16$

Short Tricks :-

Sum = $\frac{1}{(n-1)d}\left\{\frac{1}{k} - \frac{1}{L}\right\}$

Where , n = no. of terms in denominator
d = difference between the terms
k = first term of first denominator and
L = last term of last denominator .

Required Sum = $\frac{1}{(2-1)1}\left\{\frac{1}{5} - \frac{1}{25}\right\}$

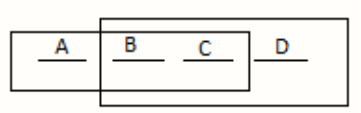
$= \left\{\frac{4}{25}\right\} = 0.16$

Sol.232.(a) Hundreds place = 2
Unit place = 2 × 2 = 4
Thousand place = 0
Ten thousand place = 6, Ten place = 5
So that , Number = 60254

Sol.233.(d) Let the middle digit be x Then 2x = 18 or x = 9 So, the number is either 396 or 693 and another pair is 594 or 495 Since the number increases on reversing the digits, so the hundred's digits is smaller than the units digit Hence, required number is 396 because difference of 594 and 495 is not 297

Sol.234.(a) Let, small number = X and larger number = Y
ATQ, Y = X + 5
Y - X = 5------(i)
X + Y = 19 ------(ii)
Solving the equation (i) & (ii)
We get the value of Y = 12 and X =7
The product of these numbers
= XY =12 × 7 =84

Sol.235.(c)



$\frac{B\times C\times D}{A\times B\times C} = \frac{7429}{4199} \rightarrow \frac{D}{A} = \frac{23}{13}$

So , the largest prime no. is 23 .

Sol.236.(a) If we multiply 495 by 36 we get 17820 as result. But if boy read 6 in place of 9 he got 16740 as result
So 9 is erroneously read as 6.

Sol.237.(a) Let the initial number = x
A/Q, $x^2 - 15 = (x-15)^2$
$= x^2 - 15 = x^2 + 225 - 30x$
$= 30x = 240 \Rightarrow x = 8$

Sol.238.(d) If we observe the given number we find that the nearest number to 327 which would be a perfect square is 324.
So 0.000327 - 0.000324 = 0.000003

Sol.239.(c) If the denominator of a rational number is of the form
2^n5^m, where n and m are non-negative integers, then the decimal expansion of the number will definitely be a terminating decimal. i.e. a decimal number which has all terms zero, after some places on the right side of the decimal place.
E.g. $\frac{7}{20} = \frac{7}{2^2\times5^1} = 0.35$
[here both n, m are non-negative integers and the result is a terminating decimal number]

Sol.240.(c) The mean of the first eight composite natural numbers = $\frac{78}{8}$
The mean of the first eight prime numbers = $\frac{77}{8}$
So, the required difference
$= \frac{78}{8} - \frac{77}{8} = \frac{1}{8}$

Sol.241.(d) According to question,
Let the number is
$(10x + y)$, Then
$(10x + y) + 18 = (10y + x)$
9x - 9y = -18
= x - y = -2 ..... eq .(1)
$(x \times y) = 8$ .....(given)
$(x+y)^2 - (x-y)^2 = 4xy$
$\Rightarrow (x+y)^2 - (-2)^2 = 4\times8$
$(x+y)^2 = 36 \Rightarrow (x+y) = \sqrt{36}$
$= (x+y) = 6$ ..... eq .(2)
From eq .(1) and eq .(2) we get ,
x = 2 , y = 4 so number is 24

Sol.242.(a) Let , the largest number is **a** and the smallest number is **b**
According to question ,
a = 15b , and product of these number
$= (a \times b) = 9375 \Rightarrow (15b \times b) = 9375$
$b^2 = \frac{9375}{15} \Rightarrow b^2 = 625 \Rightarrow$ b = 25
Now, a = 15b ⇒ a = 15 × 25 = 375
Required sum = 375 + 25 = 400

Sol.243.(b) Let the three consecutive natural numbers are n, (n + 1) and (n + 2)
Product of the numbers = n (n + 1) (n + 2)
It is always divisible by 6.

Sol.244.(d)
Irrational number : An irrational number is a type of real number which cannot be expressed as a simple fraction.
Now check each option one by one.
(a) $\sqrt{3}\times\sqrt{27} = \sqrt{81} = 9$
(b) $4\sqrt{4} = 4\times2 = 8$
(c) $\sqrt{169} - \sqrt{196} = 13 - 14 = -1$
(d) $\sqrt{9} + \sqrt{7} = 3 + \sqrt{7}$,
it is not a simple fraction, so this is an irrational number.

Sol.245.(b) Let the numerator be x, then denominator = x + 10
Required rational number = $\frac{x}{x+10}$
According to question, $\frac{x+4}{x+10-3} = \frac{5}{6}$
$= 6x + 24 = 5x + 35$
$= 6x - 5x = 35 - 24 \Rightarrow x = 11$
Hence, the original rational number
$= \frac{11}{11+10} = \frac{11}{21}$

Sol.246.(a) Concept :-
If a number of the form
$x^a \times y^b \times z^c$ ..... and so on, then total prime factors
= a + b + c..... and so on
Where x, y, z,... are prime numbers
The number $8^{10} \times 9^7 \times 7^8$ can be written as $\left(2^3\right)^{10} \times \left(3^2\right)^7 \times 7^8 = 2^{30} \times 3^{14} \times 7^8$
Total number of prime factors = 30 +14 +8
∴ The total number of prime factors are 52

Sol.247.(d) Let the number is x
According to question,
$\frac{\left\{\left(x+2\frac{1}{2}\right)\times4\frac{1}{2}\right\}+3}{1\frac{1}{5}} = 25$

$= \{(x+2\frac{1}{2})\times4\frac{1}{2}\} + 3 = 30$

$= \{(x+2\frac{1}{2})\times4\frac{1}{2}\} = 27$

$= (x+2\frac{1}{2}) = 6$

$= x = 6 - \frac{5}{2} = \frac{7}{3} = 3\frac{1}{2}$

Sol.248.(b) Concept:-
When x , x , x , ... are divided by 'd' individually the respective remainders obtained are R , R , R , ... etc. and when (x + x + x + ...) is divided by 'd' the remainders can be obtained by dividing (R + R + R .....) by d The remainder when 1661, 1551, 1441, 1331, 1221 are divided by 20 are 1, 11, 1, 11, 1. So the required remainder can be obtained just by dividing, (1 + 11 + 1 + 11 + 1 = 25) by 20.
Hence, the required remainder is 5.

Sol.249.(c) According to question,
Let a , b, and c be the number
$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$
$(a + b + c)^2 = 138 + 2(381)$
$(a + b + c) = \sqrt{138 + 762} = \sqrt{900}$
$(a + b + c) = 30$
Therefore required sum is 30

Sol.250.(c) Total number in set S {200, 201, 202, ...,800} = (800 - 200) + 1 = 601
Total number which are divisible by 5
= 800 = 200 + (n - 1)5
= 120 = (n - 1) ⇒ n = 121
Total number which are divisible by 7
= 798 = 203 + (n - 1)7 ⇒ 595 = (n - 1)7
⇒ n = 86
Total number which are divisible by 35
= 770 = 210 + (n - 1)35
= 560 = (n - 1)35 ⇒ n = 17
Total number which are divisible by neither of 5 nor 7 = 601 - 121 - 86 + 17
= 411

Sol.251.(c) M × A × T = 1947
M × A × T = 3 × 11 × 59 = 1 × 3 × 649
So , for the maximum value
M + A + T = 1 + 3 + 649 = 653

Sol.252.(c) Let the number be xyz
On reversing it , we get zyx
According to question,
(100z + 10y + x) - (100x + 10y + z) = 198
99z - 99x = 198 ⇒ z - x = 2
Then, x - z = - 2
No. of possible pairs = (0, 2), (1, 3), (2, 4), (3, 5), (4, 6), (5, 7), (6, 8), (7, 9)
But (0,2) is not valid as we need to make 3-digit no. so we have 7 cases and for y we can take any values from (0 to 9) ; so we have 10 cases.
Hence, the no. of possible three - digit numbers which are greater than 100
= 7 × 10 = 70

Sol.253.(d)
$x_1 - x_2 + x_3 - \ldots\ldots + (-1)^{n+1} x_n = n^2 + 2n$
For n = 48 , we have ;
$x_1 - x_2 + x_3 - \ldots\ldots - x_{48} = 48^2 + 48 \times 2$
eq .---------(1)
For n = 49 , we have ;
$x_1 - x_2 + x_3 - \ldots\ldots - x_{48} + x_{49} = 49^2 + 49 \times 2$
eq .---------- (2)
For, n = 50, we have ;
$x_1 - x_2 + x_3 - \ldots\ldots - x_{48} + x_{49} - x_{50}$
$= 50^2 + 50 \times 2$ - eq .---------- (3)
Subtracting eqn(1) from (2) we get ;
$x_{49} = (49^2 + 49 \times 2) - (48^2 + 48 \times 2)$
$= 49^2 - 48^2 + 2(49 - 48) = 99$
Subtracting eqn(3) from (2) we get ;
$x_{50} = (49^2 + 49 \times 2) - (50^2 + 50 \times 2)$
$= 49^2 - 50^2 + 2(49 - 50) = -101$
So, $x_{49} + x_{50} = 99 - 101 = -2$

Sol.254.(b) Given that
x and y are the prime number
And, $x - y = 36$
Then, the possible numbers which are prime and the difference between them is also 36 = 37 and 73
i.e. $73 - 37 = 36$
So, value of x = 73 and y = 37
Hence, product of the number (xy)
= 73 × 37 = 2701

Sol.255.(c)

1. Factor of number $\frac{n(n^2+2)}{3} = \frac{n}{3} \times (n^2 + 2)$
For natural numbers (i.e. n = 1 , 2 , 3 , 4 , 5.....) , $n(n^2 + 2)$ is always divisible by denominator 3
So, $\frac{n(n^2+2)}{3}$ also be natural number

2. For the number $\frac{m^4 + 4m^2 + 11}{16}$ Put an odd integer (i.e. n = 1 , 3 , 5.....)
$\frac{m^4 + 4m^2 + 11}{16}$ is always be divisible by 16 and gives integer value
So, $\frac{m^4 + 4m^2 + 11}{16}$ also be integer

Sol.256.(c) Given that a + b + c + d = 200 (even number)
For the sum of all four numbers be even
Case 1. all four numbers be even
Case 2. all four numbers be odd
Case 3. two of them be even and two of them be odd
So, for Case 1
$S = (-1)^{even} + (-1)^{even} + (-1)^{even} + (-1)^{even} = 4$
for Case 2
$S = (-1)^{odd} + (-1)^{odd} + (-1)^{odd} + (-1)^{odd} = -4$
for Case 3
$S = (-1)^{even} + (-1)^{even} + (-1)^{odd} + (-1)^{odd} = 0$
Hence, possible value of S = three

Sol.257.(b) Let bigger number is x and smaller number is y
Case 1 - when three times the greater of two numbers is divided by the smaller number, the quotient will be 6 and the remainder will be 6 then,
$3x = 6y + 6 \Rightarrow x - 2y = 2$ ----------(1)
Case 2 - If five times the smaller number is divided by the greater number, the quotient will be 2 and the remainder will be 3 then,
$5y = 2x + 3 \Rightarrow 2x - 5y = -3$ ----------(2)
By the equation (1) × 2 – equation (2) we get; y = 7 and x = 16
Hence, difference between the numbers = 16 - 7 = 9

Sol.258.(c) Let x = abc
or x = 100a + 10b + c .... (1)
Now all possible value of y:
= acb, bac, bca, cab, cba
Taking "acb" first:
We can write acb in following form,
= y = acb = 100a + 10c + b .....(2)
By, subtracting (1) from (2); we get
$(x - y) = 9(b - c)$
Here, we can see that 9 is a factor.
So, the number must be divisible by 9.

Sol.259.(b)
We know that $\sqrt{361}$ = 19 and $\sqrt{400}$ = 20
So, $19 < \sqrt{372} < 20$
Also, $273 < \sqrt{74629} < 274$
So, 20, 21, 22, ..., 273.
First term a = 20, last term T_n = 273 and difference d = 21 - 20 = 1
T_n = a + (n - 1)d
273 = 20 + (n - 1)1
253 = (n - 1) ⇒ n = 254
So, required answer = 254

HCF and LCM

LCM (Least common multiple) of two or more given numbers is the least number that is exactly divisible by each of them.

HCF (Highest common factor) of two or more numbers is the greatest number that divides each of them exactly. HCF is also known as the 'Highest common Divisor' (HCD) and the Greatest Common Measure (GCM).

The concept of multiples and factors

If X , Y , and Z are three natural numbers and X × Y = Z , then
(i). X and Y will be factors of Z.
(ii). Z will be divisible by X and Y.
(iii). Z will be a multiple of X and Y.
i.e. The set of positive Integers which are factors of 18 is (1, 2, 3, 6, 9, 18).

Basic Concepts of H.C.F. and LCM

Method of finding H.C.F.

To find the HCF of the given numbers

1. Break the given numbers into their prime factors.
2. The HCF will be the product of all the prime factors common to all the numbers.

Let us learn the process of finding HCF with the help of some solved examples.

Example:- Find the HCF of 96, 36 and 18.

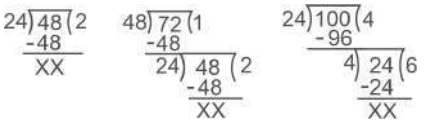
Solution:- 96 = **2 × 3** × 2 × 2 × 2 × 2
36 = **2 × 3** × 2 × 3
18 = **2 × 3** × 3
Therefore, the HCF of 96, 36 and 18 is the product of the highest number of common factors in the given numbers i.e., 2 × 3 = 6. In other words, 6 is the largest possible integer, which can divide 96, 36 and 18 without leaving any remainder.

Example:- Find the H.C.F. of 42 and 70.
Solution:- 42 = 3 × **2 × 7**
70 = 5 × **2 × 7**
Hence, H.C.F. of 42 and 70 = 2 × 7 = 14.

HCF by Division Method

Example:- HCF of 24, 48, 72, and 100.

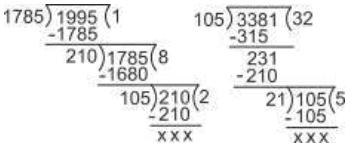
Solution:- To start the division method select the smallest two numbers./



HCF of 24 and 48 = 24
HCF of 24, 48 and 72 = 24
HCF of 24, 48, 72, and 100 = 4.

Example:- HCF of 1785, 1995, 3381.

Solution:-



HCF of 1785 and 1995 = 105
HCF of 1785, 1995 and 3381 = 21

NOTE :-
(i). HCF of two prime numbers is always 1.
(ii). HCF of co-prime numbers is always 1.

Method of finding L.C.M

The Least Common Multiple of two or more numbers is the smallest number which is exactly divisible by all of them. In other words, it is the product of the highest powers of all the prime factors of the given numbers.

To find the LCM of given numbers:

1. Break the given numbers into their prime factors.
2. The LCM will be the product of the highest power of all the factors that occur in the given numbers.

Let us take some solved examples.

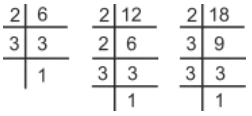
Example:-Find the LCM of 96, 36 and 18.
Solution: 96 = 2 × 2 × 2 × 2 × 2 × 3
$= 2^5 \times 3^1$; 36 = 2 × 2 × 3 × 3 = $2^2 \times 3^2$
18 = 2 × 3 × 3 = $2^1 \times 3^2$

Therefore, LCM of 96, 36 and 18 is the product of the highest powers of all the prime factors, i.e. $2^5 \times 3^2$ = 32 × 9 = 288.
That is, 288 is the smallest integer which is divisible by 96, 36 and 18 without leaving any remainder.

Example:- Find the LCM of 42 and 70
Solution:- 42 = 3 × 2 × 7
70 = 5 × 2 × 7
Hence, LCM is 2 × 3 × 5 × 7 = 210.

Example:- LCM of 6, 12, 8 ?
Solution:-
LCM = 2 × 2 × 3 × 2 = 24
HCF of 6, 12, 18

Firstly find out the factors of 6, 12, 18 and then multiply the common factors.



6 = 2 × 3, 12 = 2 × 2 × 3, 18 = 2 × 3 × 3
HCF = 2 × 3 = 6
Try finding HCF and LCM of 3, 6, 9, 12 yourself. 3, 6, 9, 12 HCF can also be found by Division method. It is useful when the numbers are bigger.

NOTE :-
(i). HCF of A, B and C is the highest divisor which can exactly divide A, B, and C.
(ii). LCM of A, B and C is the lowest dividend which is exactly divisible by A, B, and C.
There is one very important relationship, given below, between two numbers and their HCF and LCM. Many problems have appeared in various competitive exams based on this relationship.

Important Concepts:-
(1). LCM × HCF = 1st number × 2nd number
i.e. For numbers 8 and 12,
LCM = 24 and HCF = 4
Now, LCM × HCF = 24 × 4 = 96
also, 8 × 12 = 96

(2). HCF of some numbers is always a factor of LCM of the numbers.

(3).
LCM of Fraction = $\frac{LCM\ of\ numerator}{HCF\ of\ denominator}$

(4).
HCF of Fraction = $\frac{HCF\ of\ numerator}{LCM\ of\ denominator}$

Example :-
LCM and HCF of $\frac{1}{2}, \frac{2}{3}$ and $\frac{3}{4}$
Solution :-
LCM = $\frac{LCM\ of\ numerator}{HCF\ of\ denominator}$

$= \frac{LCM\ of\ 1,2,\ 3}{HCF\ of\ 2,3,4} = \frac{6}{1}$

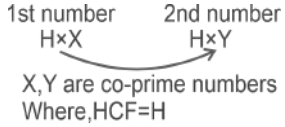
HCF = $\frac{HCF\ of\ numerator}{LCM\ of\ denominator}$

$= \frac{HCF\ of\ 1,2,\ 3}{LCM\ of\ 2,3,4} = \frac{1}{12}$

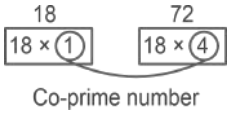
(5) Co- Prime numbers :
If the HCF of two numbers is 1 then they are called co-prime numbers.

(6) $\frac{LCM}{HCF} = Product;$
where LCM and HCF are of two numbers $N_1\ and\ N_2$. If we find two co-prime factors, $F_1\ and\ F_2$, of the Product as obtained above then:

(7).

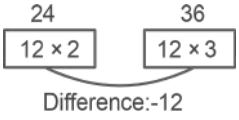


i.e.

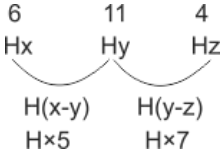


(8).
If 1st number = N_1 and 2nd number = N_2
HCF of N_1 = Hx
HCF of N_2 = Hy
And HCF of N_1 and N_2 = H
So ,
Difference between N_1 and N_2 = Hx - Hy
= H(x - y)

i.e. N_1 = 24 and N_2 = 36



Note :- HCF is always either the difference of two numbers or factors of difference of two numbers.



(9). When the second divisor is a factor of the first divisor, then the second remainder is obtained by dividing the first remainder by the second divisor.

Example:- When 29 is divided by 8, the remainder obtained is 5, then what will be the remainder when the same number is divided by 4 ?

Solution:- Here, the second divisor that is 4 is a factor of the first divisor that is 8. So, on dividing the first remainder that is 5 by the second divisor that is 4, we get our second remainder which is 1. So, the required answer is 1.

Variety Questions

Q.1. If the sum of two numbers is 60 and their HCF and LCM are 5 and 60, respectively, then the sum of the reciprocals of the numbers will be:
SSC CPO 05/10/2023 (3rd Shift)
(a) $\frac{1}{4}$ (b) $\frac{1}{5}$ (c) $\frac{1}{11}$ (d) $\frac{1}{6}$

Q.2. A person has three iron bars whose lengths are 20, 30 and 40 metres, respectively. He wants to cut pieces of the same length from each of the three bars. What is the least number of total pieces if he cuts without any wastage ?
SSC CPO 04/10/2023 (2nd Shift)
(a) 9 (b) 10 (c) 8 (d) 11

Q.3. The LCM and HCF of two numbers are 1105 and 5. If the LCM is 17 times the first number, then find the two numbers.
SSC CPO 04/10/2023 (2nd Shift)
(a) 55 and 85 (b) 65 and 75
(c) 60 and 80 (d) 65 and 85

Q.4. The least number which should be added to 1351 so that the sum is exactly divisible by 2,4,6 and 8 is:
SSC CPO 03/10/2023 (3rd Shift)
(a) 13 (b) 11 (c) 15 (d) 17

Q.5. Find the greatest possible length (in metres) that can be used to exactly measure the lengths 6 m, 5 m 25 cm and 12 m 50 cm.
SSC CPO 03/10/2023 (2nd Shift)
(a) 0.35 m (b) 0.90 m
(c) 0.75 m (d) 0.25 m

Q.6. What is the HCF of the polynomials $(x^3 - 8)$, $(x^3 - 6x^2 + 12x - 8)$ and $(x^3 - 4x^2 + x)$?
SSC MTS 12/09/2023 (3rd Shift)
(a) $(x - 1)$ (b) $(x - 2)$ (c) $(x - 8)$ (d) $(x - 4)$

Q.7. Radha, Pratima and Reena begin to jog around a circular path and they complete their revolutions in 50 seconds, 75 seconds and 100 seconds, respectively. After how much time (in minutes) will they meet together at the starting point for the first time?
SSC MTS 11/09/2023 (3rd Shift)
(a) 6 (b) 5 (c) 4 (d) 3

Q.8. Find the least number which when divided by 19, 36 and 54 leaves a remainder of 4 in each case.
SSC MTS 06/09/2023 (3rd Shift)
(a) 2056 (b) 1854 (c) 2172 (d) 1925

Q.9. What is the largest number that divides 627, 15630 and 3128 and leaves remainders of 2, 5 and 3, respectively?
SSC MTS 04/09/2023 (3rd Shift)
(a) 775 (b) 650 (c) 625 (d) 1225

Q.10. The least common multiple (LCM) of p and q is r . The LCM of p^2q and pq^2 is _____.
SSC MTS 04/09/2023 (2nd Shift)
(a) pqr^3 (b) pqr (c) pq (d) pqr^2

Q.11. If the LCM and the HCF of two numbers are 12 and 2 respectively, then find the mean proportional of these numbers.
SSC CGL 17/07/2023 (1st shift)
(a) $2\sqrt{6}$ (b) $\sqrt{14}$ (c) 2 (d) $\sqrt{6}$

Q.12. The largest number of four digits that is divisible by 12, 15 and 18 is _____ .
Selection Post 28/06/2023 (1st Shift)
(a) 9450 (b) 9900 (c) 9000 (d) 9750

Q.13. The HCF of two numbers is 11 and their LCM is 693. If one of the numbers is 77, find the other.
SSC CHSL Tier II (26/06/2023)
(a) 66 (b) 99 (c) 55 (d) 44

Q.14. The length, breadth, height of a room is 6 m, 4 m 80 cm and 3 m 60 cm respectively. Find the longest tape which can measure the dimensions of the room exactly.
SSC MTS 20/06/2023 (Evening)
(a) 1 m 40 cm (b) 1m 20 cm
(c) 1 m 80 cm (d) 1 m 50 cm

Q.15. Find the ratio of the LCM of 44, 10 and 5 to the HCF of 50 and 75.
SSC MTS 12/05/2023 (Afternoon)
(a) 15 : 2 (b) 45 : 7 (c) 50 : 3 (d) 44 : 5

Q.16. Find the LCM of reciprocals of 22 and 16.
SSC MTS 11/05/2023 (Evening)
(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{1}{4}$

Q.17. HCF of $\frac{3}{4}$, $\frac{15}{16}$, and $\frac{18}{5}$ is:
SSC MTS 04/05/2023 (Morning)
(a) $\frac{3}{80}$ (b) $\frac{18}{5}$ (c) $\frac{5}{16}$ (d) $\frac{15}{16}$

Q.18. Two numbers are in the ratio 11 : 6. If their HCF is 4, find the smallest number.
SSC MTS 02/05/2023 (Afternoon)
(a) 30 (b) 18 (c) 24 (d) 12

Q.19. What is the HCF of 3^{29} - 9 and 3^{38} - 9?
UPSC CDS - I (16/04/2023)
(a) 3^9 - 1 (b) 3^{11} - 1
(c) 3^{11} - 3 (d) 3^{11} - 9

Q.20. The product of two numbers is 2160 and their HCF is 12. If the sum of the squares of the two numbers is 4896, then what is the mean of the two numbers?
UPSC CDS - I (16/04/2023)
(a) 24 (b) 36 (c) 48 (d) 96

Q.21. The LCM of three different numbers is 240. Which of the following cannot be their HCF?
SBI PO Pre 19/12/2022 (2nd Shift)
(a) 8 (b) 12 (c) 24 (d) 35

Q.22. What is the largest common divisor of the numbers 1026, 2268 and 2430 ?
SSC CGL 02/12/2022 (1st Shift)
(a) 108 (b) 54 (c) 81 (d) 27

Q.23. A school has less than 5000 students and if the students are divided equally into teams of either 9 or 10 or 12 or 25 each, exactly 4 are always left out. However, if they are divided into teams of 11 each, no one is left out. The maximum number of teams of 12 each that can be formed out of the students in the school is
CAT 27/11/2022 (3rd Slot)
(a) 140 (b) 160 (c) 150 (d) 170

Q.24. If a and b are positive integers, then what is HCF of ($\frac{a}{HCF\ of\ (a,b)}$, $\frac{b}{HCF\ of\ (a,b)}$) equal to ?
SBI Clerk Pre 12/11/2022 (2nd Shift)
(a) a (b) b (c) 1 (d) $\frac{a}{HCF\ (a,\ b)}$

Q.25. What is the LCM of $a^3b - ab^3$, $a^3b^2 - a^2b^3$, $ab(a - b)$?
SSC CPO 11/11/2022 (Afternoon)
(a) $a^2b^2\ (a^2 + b^2)$ (b) $a^2b^2\ (a^2 - b^2)$
(c) $a^2b^3\ (a^2 + b^2)$ (d) $a^3b^2\ (a^2 - b^2)$

Q.26. The sides of a triangular field are 62 m, 186 m and 279 m. Find the greatest length of tape that would be able to exactly measure each of them without any fractions.
SSC CPO 10/11/2022 (Morning)
(a) 62 m (b) 93 m (c) 31 m (d) 30 m

Q.27. The sum of two numbers is 45 and the difference is one - ninth of the sum. Then their LCM is :
Haryana CET 05/11/2022 (1st Shift)
(a) 100 (b) 150 (c) 200 (d) 250

Q.28. Find the 4-digit smallest number which when divided by 12, 15, 25, 30 leaves no remainder?
IBPS PO Pre 15/10/2022 (1st Shift)
(a) 1020 (b) 1120 (c) 1200 (d) 1800
(e) None of these

Q.29. A tailor has 22 metres of cloth and he has to cut each metre of cloth into 5 pieces. How many pieces can he get from the 22 metres of cloth he has?
RRC Group D 11/10/2022 (Afternoon)
(a) 11 (b) 55 (c) 110 (d) 1110

Q.30. If a and b are two co-prime numbers, then their LCM is:
RRC Group D 11/10/2022 (Morning)
(a) a + b (b) a × b (c) $\frac{a-b}{a+b}$ (d) $a - b$

Q.31. The HCF of fractions is calculated as $\frac{HCF\ of\ the\ numerators}{LCM\ of\ the\ denominators}$. find the HCF of $\frac{2}{3}$, $\frac{4}{5}$ and $\frac{3}{2}$.
RRC Group D 29/09/2022 (Evening)
(a) $\frac{5}{30}$ (b) $\frac{3}{50}$ (c) $\frac{1}{30}$ (d) $\frac{1}{40}$

Q.32. Find the scale with the greatest possible length which can measure poles of length 3 m 96 cm, 5m 28 cm, and 7 m 92 em exact number of times.
RRC Group D 19/09/2022 (Afternoon)
(a) 3 m 21 cm (b) 33 cm
(c) 66 cm (d) 1 m 32 cm

Q.33. The traffic signals at three different road crossings change after every 45 seconds, 75 seconds and 90 seconds respectively. If they all change simultaneously at 9:30:00 a.m., then at what time will they next change again simultaneously?
RRC Group D 17/09/2022 (Afternoon)
(a) 9 : 39 : 20 a.m. (b) 9 : 38 : 00 a.m.
(c) 9 : 39 : 10 a.m. (d) 9 : 37 : 30 a.m.

Q.34. The LCM of two numbers is 588. Which of the following CANNOT be their HCF?
RRC Group D 16/09/2022 (Evening)
(a) 49 (b) 21 (c) 35 (d) 28

Q.35. Three numbers are in the ratio 5 : 6 : 8 and their LCM is 1200. The sum of the numbers is:
RRC Group D 14/09/2022 (Evening)
(a) 180 (b) 210 (c) 200 (d) 190

Q.36. A conference is being organized by an educational institution, where the participants will be teachers of different subjects. The number of participants in Physics, Chemistry and Mathematics are 112, 144 and 192 respectively. Equal number of participants are to be seated in each room, and all the participants sitting in a room should be teachers of the same subject. Find the minimum number of rooms required for the event.
RRC Group D 06/09/2022 (Afternoon)
(a) 35 (b) 23 (c) 32 (d) 28

Q.37. If the product of two numbers is 8410 and their HCF is 29, then their LCM is:
RRC Group D 05/09/2022 (Morning)
(a) 330 (b) 290 (c) 270 (d) 310

Q.38. Four bells ring at intervals of 4 minutes, 8 minutes, 12 minutes, and 24 minutes respectively. All the four bells rang together at 12 noon. How many times after 12 noon will all the four bells ring together in the next four hours, with the ringing at 4 p.m. being included?
RRC Group D 02/09/2022 (Afternoon)
(a) 10 times (b) 9 times
(c) 8 times (d) 11 times

Q.39. Find the greatest number by which when the numbers 57, 95 and 211 are divided, it leaves the same remainder in each case.
RRC Group D 26/08/2022 (Morning)
(a) 3 (b) 4 (c) 1 (d) 2

Q.40. Find the least number which when added to 2488, then number obtained will be completely divisible by 3, 4, 5 and 6.
RRC Group D 23/08/2022 (Evening)
(a) 34 (b) 28 (c) 42 (d) 32

Q.41. The HCF of 108 and 144 is
RRC Group D 18/08/2022 (Evening)
(a) 36 (b)16 (c) 24 (d) 12

Q.42. If K1 and K2 are two distinct prime numbers, then what is the product of the highest common factor and the least common multiple of K1 and K2?
SSC MTS 20/07/2022 (Afternoon)
(a) 1 (b) $\frac{k1}{k2}$ (c) k1 + k2 (d) k1 × k2

Q.43. P = $2^5 \times 3^8$ and Q = $2^3 \times 3^K$. If the highest common factor of P and Q is $2^3 \times 3^3$, then what is the value of K?
SSC MTS 15/07/2022 (Morning)
(a) 1 (b) 2 (c) 3 (d) 5

Q.44. The traffic lights at 3 different road crossings change after every 48 sec, 72 sec and 108 sec, respectively. If they all change simentionusly at 8 : 20 a.m., then at what will they next change again simultaneously?
SSC MTS 07/07/2022 (Morning)
(a) 8 : 27 : 12 a.m. (b) 8 : 33 : 32 a.m.
(c) 8 : 12 : 18 a.m. (d) 8 : 40 : 14 a.m.

Q.45. Find the HCF of $3x^2yz$, $5xy^2z$, $12x^2y^2z^3$.
NTPC CBT II (15/06/2022) 2nd Shift
(a) 180xyz (b) xyz
(c) $180x^5y^5z^5$ (d) $180x^2y^2z^3$

Q.46. A circus runs two shows, one with a lion and another with an elephant, separately. The show with the elephant runs for 80 minutes, and the show with the lion runs for 120 minutes. Both shows start at 6 pm. At what time will both shows start again at the same time?
NTPC CBT II (13/06/2022) 1st Shift
(a) 10 : 00 pm (b) 7 : 40 pm
(c) 7 : 00 pm (d) 8 : 20 pm

Q.47. What is the smallest cubic number, which is divisible by 72, 108 and 300 ?
NTPC CBT II (12/06/2022) 1st Shift
(a) 3375 (b) 27000 (c) 5400 (d) 21600

Q.48. What is the Five digit least number which when decreased by 7 is divisible by 15, 24, 28 and 32?
SSC CGL 13/04/2022 (Evening)
(a) 10097 (b) 10087 (c) 10067 (d) 10077

Q.49. A and B are two prime numbers such that A > B and their LCM is 209. The value of A^2 - B is ?
SSC CGL 12/04/2022(Evening)
(a) 350 (b) 372 (c) 361 (d) 339

Q.50. The sum of and difference between the LCM and HCF of two numbers are 512 and 496, respectively. If one number is 72, then the other number is
SSC CGL Tier II (29/01/2022)
(a) 40 (b) 64 (c) 56 (d) 80

Q.51. Find the greatest possible length which can be used to measure exactly the lengths 4m 95cm, 9m and 16m 65cm.
SBI PO Mains (02/01/2022)
(a) 15 cm (b) 35 cm (c) 45 cm (d) 54 cm

Q.52. A shopkeeper has 3 different qualities of Milk. 621 litres of 1st quality, 644 liters of 2nd quality and 690 litres of 3rd quality. Find the least possible number of bottles of equal size in which different Milk of different qualities can be filled without mixing?
UP S.I. 29/11/2021 (Morning)
(a) 65 (b) 23 (c) 35 (d) 85

Q.53. Find the smallest 4 digit number which is divided by 8, 10, 12, 15, 20 and leaves the remainder as 7.
UP S.I. 12/11/2021 (Afternoon)
(a) 1100 (b) 1073 (c) 1087 (d) 1080

Q.54. The least number of square tiles required to pave the ceiling of a room 12 m 95 cm long and 3 m 85 cm broad, is:
SSC MTS 11/10/2021 (Afternoon)
(a) 417 (b) 407 (c) 467 (d) 437

Q.55. Joseph visits the club on every 5th day, Harsh visits on every 24th day, while Sumit visits on every 9th day. If all three of them met at the club on a Sunday, then on which day will all three of them meet again ?
UPSC CSAT (10/10/2021)
(a) Monday (b) Wednesday
(c) Thursday (d) Sunday

Q.56. Find the HCF of the first 100 natural numbers.
RRB NTPC CBT - I 24/07/2021 (Evening)
(a) 1 (b) 10 (c) 2 (d) 100

Q.57. If x + y = 40 and x - y = 20, then the HCF of x and y is:
RRB NTPC CBT - I 24/07/2021 (Morning)
(a) 30 (b) 40 (c) 20 (d) 10

Q.58. What is the HCF of n and n + 1 where n is a natural number?
RRB NTPC CBT - I 22/02/2021 (Morning)
(a) 3 (b) 2 (c) 0 (d) 1

Q.59. If the LCM of a and b is c, then their HCF is:
RRB NTPC CBT - I 29/01/2021 (Evening)
(a) $\frac{bc}{a}$ (b) $\frac{ab}{c}$ (c) $\frac{ac}{b}$ (d) $\frac{c}{ab}$

Q.60. What is the LCM of $\sqrt[2]{169}$, $\sqrt[3]{27}$, $\sqrt[3]{64}$ and $\sqrt[2]{144}$?
RRB NTPC CBT - I 21/01/2021 (Morning)
(a) 468 (b) 156 (c) 321 (d) 182

Q.61. The HCF of 24 and 144 is '10p + 4', then the value of p is:
RRB NTPC CBT - I 20/01/2021 (Evening)
(a) 1 (b) 4 (c) 2 (d) 3

Q.62. The L.C.M of two consecutive positive integers x and x + 1 is:
RRB NTPC CBT - I 18/01/2021 (Evening)
(a) x (b) x(x + 1) (c) 1 (d) x + 1

Q.63. Determine the LCM of $\frac{2}{3}$, $\frac{4}{9}$, $\frac{8}{15}$ and $\frac{10}{21}$.
RRB NTPC CBT - I 13/01/2021 (Evening)
(a) $\frac{20}{3}$ (b) $\frac{3}{20}$ (c) $\frac{3}{40}$ (d) $\frac{40}{3}$

Q.64. What is the sum of the digits of the least number which when divided by 15, 18 and 36 leaves the same remainder 9 in each case and is divisible by 11?
SSC CPO 25/11/2020(Morning)
(a) 18 (b) 16 (c) 17 (d) 15

Q.65. The LCM of 165, 176, 385 and 495 is k. When k is divided by the HCF of the numbers, the quotient is p. What is the value of p?
SSC CPO 13/12/2019 (Morning)
(a) 2520 (b) 5040 (c) 6720 (d) 3360

Q.66. Find the HCF and LCM of $\frac{2}{3}$, $\frac{8}{9}$, $\frac{16}{81}$ and $\frac{10}{27}$
LIC Assistant Pre 31/10/2019 (1st Shift)
(a) $\frac{3}{82}$, $\frac{80}{3}$ (b) $\frac{2}{81}$, $\frac{80}{3}$
(c) $\frac{2}{81}$, $\frac{90}{3}$ (d) None of these

Q.67. Find the HCF of $a^3b^3c^3$, $a^2b^2c^2$, abc and a^2bc .
RRB JE 27/06/2019 (Evening)
(a) $a^4b^4c^4$ (b) $a^3b^3c^3$ (c) $a^2b^2c^2$ (d) abc

Q.68. Three numbers are in the ratio 1 : 2 : 3 and their highest common factor (HCF) is 12. What are the numbers?
Bihar Police Cons. 09/10/2012(2nd Shift)
(a) 12, 24, 36 (b) 5, 10, 15
(c) 4, 8, 12 (d) 10, 20, 30

Easy Section

SSC Previous Year Questions

Q.69. What is the LCM of 0.15, 0.18 and 0.45 ?
SSC CPO 05/10/2023 (2nd Shift)
(a) 0.6 (b) 0.9 (c) 0.81 (d) 0.09

Q.70. The HCF of 3888 and 3969 is:
SSC CPO 04/10/2023 (2nd Shift)
(a) 81 (b) 73 (c) 83 (d) 71

Q.71. Find the LCM of 15, 24, 35 and 54.
SSC CPO 03/10/2023 (1st Shift)
(a) 7650 (b) 7560 (c) 6570 (d) 5670

Q.72. The largest three-digit number which gives the same remainder 2 when divided by 3, 5 and 9 is _____.
SSC MTS 08/09/2023 (1st Shift)
(a) 980 (b) 992 (c) 995 (d) 990

Q.73. Two tankers contain 850 litres and 680 litres of oil. Find the maximum capacity of a container which can measure the oil of both tankers when used, an exact number of times.
SSC MTS 06/09/2023 (2nd Shift)
(a) 425 litres (b) 680 litres
(c) 340 litres (d) 170 litres

Q.74. What is the HCF of 513 and 1017?
SSC MTS 16/06/2023 (Evening)
(a) 15 (b) 8 (c) 9 (d) 13

Q.75. What will be the HCF of 0.25 and 1.25 ?
SSC MTS 15/06/2023 (Evening)
(a) 0.25 (b) 1.25 (c) 2.5 (d) 0.5

Q.76. What is the HCF of 2.7 and 20.25?
SSC MTS 15/06/2023 (Afternoon)
(a) 1.45 (b) 1.35 (c) 16.5 (d) 15.5

Q.77. What is the Highest Common Factor of $\frac{3}{8}$ and $\frac{4}{9}$?
SSC MTS 13/06/2023 (Evening)
(a) $\frac{1}{18}$ (b) $\frac{1}{108}$ (c) $\frac{1}{36}$ (d) $\frac{1}{72}$

Q.78. The product of two numbers 6552 and their HCF is 6. What is the LCM of those numbers?
SSC MTS 19/05/2023 (Afternoon)
(a) 1024 (b) 1224 (c) 1084 (d) 1092

Q.79. Three numbers are in the ratio 2 : 3 : 5 and their LCM is 60. What is the HCF of the numbers?
SSC MTS 16/05/2023 (Evening)
(a) 2 (b) 4 (c) 10 (d) 6

Q.80. The least number which when divided by 14, 18 and 36 and leaves 1 as remainder in each case is:
SSC MTS 16/05/2023 (Morning)
(a) 250 (b) 252 (c) 253 (d) 251

Q.81. LCM of $\frac{5}{33}, \frac{25}{11}, \frac{20}{55}$ and $\frac{15}{77}$ is :
SSC MTS 15/05/2023 (Morning)
(a) $\frac{300}{11}$ (b) $\frac{300}{77}$ (c) $\frac{25}{33}$ (d) $\frac{500}{11}$

Q.82. Which is the greatest number of four digits divisible by 12, 25 and 45?
SSC MTS 11/05/2023 (Morning)
(a) 9890 (b) 9999 (c) 9800 (d) 9900

Q.83. The product of two co-prime numbers is 483. Find the Least Common Multiple of both numbers.
SSC MTS 08/05/2023 (Afternoon)
(a) 483 (b) 21 (c) 1 (d) 23

Q.84. What is the HCF of 1.05 and 6.23?
SSC MTS 03/05/2023 (Evening)
(a) 0.89 (b) 0.21 (c) 0.07 (d) 0.35

Q.85. Three metal rods of length 77 cm, 110 cm and 121 cm are to be cut into parts of equal length. Each part must be as long as possible. What is the maximum number of pieces that can be cut?
SSC MTS 03/05/2023 (Morning)
(a) 18 (b) 28 (c) 11 (d) 21

Q.86. What is the HCF of two prime numbers X and Y ?
SSC MTS 02/05/2023 (Morning)
(a) 1 (b) 2 (c) Y (d) X

Q.87. The HCF of $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}$ and $\frac{7}{8}$ is:
SSC CGL 09/12/2022 (3rd Shift)
(a) $\frac{105}{2}$ (b) $\frac{1}{24}$ (c) $\frac{7}{24}$ (d) $\frac{1}{48}$

Q.88. The LCM of two numbers is 120 and the numbers are in the ratio 3 : 8. The sum of the numbers will be:
SSC CGL 03/12/2022 (3rd Shift)
(a) 48 (b) 55 (c) 45 (d) 60

Q.89. Two wires of lengths 10 m 54 cm and 11 m 56 cm are both cut into pieces of length x cm each, where x is an integer. Find the maximum value of x.
SSC MTS 21/07/2022 (Evening)
(a) 42 (b) 56 (c) 34 (d) 28

Q.90. Four runners started running simultaneously from a point on a circular track. They took 400 seconds, 600 seconds, 720 seconds and 900 seconds to complete one round. After how much time did they meet at the starting point for the first time since the race started?
SSC CHSL 03/06/2022(Morning)
(a) 4200 sec (b) 2400 sec
(c) 3600 sec (d) 1800 sec

Q.91. What is the largest number that divides 460, 491 and 553 and leaves the remainder 26 in each case ?
SSC MTS 06/08/2019 (Afternoon)
(a) 27 (b) 35 (c) 33 (d) 31

Q.92. What is the HCF of $2^3 \times 3^4$ and $2^5 \times 3^2$?
SSC MTS 02/08/2019 (Morning)
(a) $2^5 \times 3^3$ (b) $2^3 \times 3^4$
(c) $2^3 \times 3^2$ (d) $2^5 \times 3^4$

Q.93. The greatest number of four digits which is exactly divisible by 24, 36 and 54 is:
SSC CPO 15/03/2019 (Morning)
(a) 9990 (b) 9924 (c) 9936 (d) 9960

Railway Previous Year Questions

Q.94. The LCM of fractions is calculated as $\frac{LCM\ of\ the\ numerators}{HCF\ of\ the\ denominators}$. Find the LCM of $\frac{5}{6}, \frac{6}{5}$ and $\frac{3}{2}$.
RRC Group D 28/09/2022 (Afternoon)
(a) 25 (b) 30 (c) 15 (d) 20

Q.95. What is the highest common prime factor of 7140 and 13200?
RRC Group D 28/09/2022 (Afternoon)
(a) 5 (b) 3 (c) 11 (d) 2

Q.96. The LCM and the HCF of two numbers are given as 459 and 3, respectively. If one number is 51, then find the other number.
RRC Group D 13/09/2022 (Morning)
(a) 37 (b) 21 (c) 27 (d) 33

Q.97. Which of the following is a pair of co-prime numbers?
RRC Group D 12/09/2022 (Afternoon)
(a) 81, 16 (b) 363, 77
(c) 455, 49 (d) 52, 24

Q.98. The least 3-digit number that is completely divisible by 8 and 12 is:
RRC Group D 12/09/2022 (Morning)
(a) 120 (b) 144 (c) 108 (d) 124

Q.99. Which of the following pairs of numbers is co-prime?
RRC Group D 25/08/2022 (Afternoon)
(a) (17, 23) (b) (14, 21)
(c) (15, 25) (d) (12, 24)

Q.100. Find the least common multiple (LCM) of $2^3 \times 3^2 \times 5$, $2^2 \times 5^2 \times 7$ and $3^3 \times 5^2 \times 7^2$
RRC Group D 24/08/2022 (Afternoon)
(a) $2^3 \times 3^3 \times 5^2 \times 7^2$
(b) $2^3 \times 3^2 \times 5 \times 7^3$
(c) $2^3 \times 3^2 \times 5^3 \times 7^2$
(d) $2^3 \times 3^4 \times 5^2 \times 7$

Q.101. The ratio of the HCF to the LCM of the numbers $\sqrt{64}$ and 16 is:
RRB NTPC CBT - I 06/04/2021 (Morning)
(a) 1 : 2 (b) 1 : 4 (c) 1 : 1 (d) 2 : 1

Q.102. If the LCM of p and q is pq , then the numbers of p, q must be :
RRB NTPC CBT - I 12/02/2021 (Morning)
(a) even (b) odd
(c) prime (d) composite numbers

Q.103. The LCM of two co-prime numbers is 638. If one number is 29, then the other number is.
RRB NTPC CBT - I 11/02/2021 (Morning)
(a) 32 (b) 22 (c) 11 (d) 13

Q.104. The product of the LCM and HCF of two positive numbers is 36. The difference of the two numbers is 5. Find the numbers.
RRB NTPC CBT - I 09/02/2021 (Evening)
(a) 5 and 8 (b) 5 and 9
(c) 4 and 9 (d) 4 and 8

Q.105. The LCM of two numbers is 96 and their HCF is 8. If one of the two numbers is 32, then what is the other number?
RRB NTPC CBT - I 08/02/2021 (Evening)
(a) 28 (b) 16 (c) 48 (d) 24

Q.106. 18 apple trees, 21 mango trees

and 39 orange trees have to be planted in rows such that each row contains the same number of trees and all of the same variety only. The minimum number of rows in which the trees may be planted is:
RRB NTPC CBT - I 08/02/2021 (Morning)
(a) 26 (b) 28 (c) 24 (d) 22

Q.107. The LCM of $\sqrt{36}$ and $\sqrt{64}$ is:
RRB NTPC CBT - I 03/02/2021 (Morning)
(a) 640 (b) 72 (c) 360 (d) 24

Q.108. Find the smallest number that is exactly divisible by 7, 14, 28, 35 and 42.
RRB NTPC CBT - I 23/01/2021 (Morning)
(a) 450 (b) 430 (c) 410 (d) 420

Q.109. What is the product of LCM and HCF of 18 and 42?
RRB NTPC CBT - I 18/01/2021 (Evening)
(a) 746 (b) 736 (c) 756 (d) 766

Q.110. Find the HCF of $\frac{2}{3}, \frac{4}{9}, \frac{8}{15}, \frac{10}{21}$
RRB NTPC CBT - I 11/01/2021 (Morning)
(a) $\frac{315}{4}$ (b) $\frac{2}{315}$ (c) $\frac{4}{315}$ (d) $\frac{315}{2}$

Banking Questions (Memory Based Previous Year)

Q.111. The maximum number of students among whom 1001 pens and 819 pencils can be distributed in such a way that each students gets the same number of pens and same number of pencils is
SBI Clerk Mains (15/01/2023)
(a) 1001 (b) 91 (c) 910 (d) 1911

Q.112. Find the H.C.F. and L.C.M. of 0.63, 1.05 and 2.1.
SBI PO Pre 19/12/2022 (2nd Shift)
(a) 0.21 and 6.30 (b) 1.05 and 6.30
(c) 2.1 and 0.63 (d) 0.63 and 1.05

Q.113. Find the greatest number which will divide 321,428 and 642 exactly.
SBI Clerk Pre 12/11/2022 (1st Shift)
(a) 105 (b) 107 (c) 109 (d) 102
(e) None of these

Q.114. Product of two co-prime numbers is 119 . Their L.C.M. should be
SBI Clerk Pre 12/11/2022 (1st Shift)
(a) 101 (b) 109 (c) 112 (d) 119

Q.115. Three different containers contain different quantities of mixture milk and water, whose measurements are 372 Kg, 434 Kg and 465 Kg. What biggest measure must be there to measure all the different quantities exactly?
RRB Clerk Pre 07/08/2022 (1st Shift)
(a) 1 Kg (b) 7 Kg (c) 14 Kg (d) 31 Kg

Q.116. Three different containers contain different quantities of mixture milk and water, whose measurements are 403 Kg, 434 Kg and 496 Kg. What biggest measure must be there to measure all the different quantities exactly?
SBI PO Mains (02/01/2022)
(a) 11 Kg (b) 62 Kg (c) 15Kg (d) 31 Kg

Q.117. A rectangular courtyard 3.78 metres long and 5.25 metres 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?
LIC Assistant Mains (22/12/2019)
(a) 10 cm (b) 14 cm (c) 21 cm (d) 42 cm

Q.118. The number nearest to 43582 divisible by each of 25, 50 and 150 is
LIC Assistant Mains (22/12/2019)
(a) 43650 (b) 43600 (c) 43550 (d) 43500

Q.119. Three planets revolve round the Sun once in 200, 250 and 300 days, respectively in their own orbits. When do they all come relatively to the same position as at a certain point of time in their orbits ?
LIC Assistant Pre 31/10/2019 (1st Shift)
(a) After 3000 days (b) After 2000 days
(c) After 1500 days (d) After 1200 days

Q.120. What is the least number of cut pieces of equal length that can be cut of two lengths 10 m 857 mm and 15 m 87 mm ?
LIC Assistant Pre 30/10/2019 (1st Shift)
(a) 164 (b) 172 (c) 184 (d) 194

MBA Previous Year Questions

Q.121. The least number of square tiles required to pave the floor of a room 15 m 91 cm and 9 m 46 cm broad is
CMAT 04/05/2023 (1st Slot)
(a) 814 (b) 820 (c) 840 (d) 844

Defence Exams Previous Year Questions

Q.122. If x is the HCF and y is the LCM of $\frac{3}{5}, \frac{6}{25}, \frac{9}{20}, \frac{27}{50}$ then which one of the following is correct ?
UPSC CDS - II (04/09/2022)
(a) y = 90x (b) y = 180x
(c) y = 270x (d) y = 360x

Q.123. If P = ab^2 and Q = a^2b, where a and b are prime numbers then HCF & LCM of P and Q (respectively) are :
AFCAT 26/08/2022 (1st Shift)
(a) a^2b^2, ab (b) ab, a^2b^2
(c) ab, ab (d) a^2b^2, a^2b^2

Other Exams Previous Year Questions

Q.124. The smallest five digit number which is exactly divisible by 12, 15 and 18 is :
CUET UG 11/06/2023 (2nd shift)
(a) 10000 (b) 10020 (c) 10080 (d) 10260

Q.125. Three numbers are in the ratio of 3 : 4 : 5 and their HCF and LCM are 40 and 2400, respectively the largest number is.
UPPSC CSAT (14/05/2023)
(a) 360 (b) 40 (c) 240 (d) 200

Q.126. Five bells commence tolling together and toll at intervals of 5, 10, 15, 18 and 20 seconds, respectively. How many times do they toll together in 90 minutes?
DDA JE (Civil) 01/04/2023 (Evening)
(a) 36 (b) 32 (c) 30 (d) 35

Q.127. Two numbers, both greater than 47, have HCF 47 and LCM 2585. The sum of the numbers is:
DDA JE (Civil) 29/03/2023 (Evening)
(a) 752 (b) 564 (c) 846 (d) 658

Q.128. Three numbers are in the ratio 2 : 3 : 4. If their sum is 549, what will be their HCF?
DDA JE (Civil) 29/03/2023 (Afternoon)
(a) 73 (b) 59 (c) 47 (d) 61

Q.129. If the LCM of two prime numbers a and b(a> b) is 667, then the value of 5a - 6b is:
DDA JE (Civil) 29/03/2023 (Morning)
(a) -7 (b) 3 (c) -3 (d) 7

Q.130. The traffic lights at three different signal point change after every 45 seconds, 75 seconds and 90 seconds respectively. If all change simultaneously at 7 : 20 : 15 hours, then they all next change again simultaneously at:
Haryana CET 05/11/2022 (1st Shift)
(a) 7 : 28 : 00 hr (b) 7 : 27 : 45 hr
(c) 7: 27 : 30 hr (d) 7: 27 : 50 hr

Q.131. The LCM of 2 numbers is 80 and their HCF is 4. What is the other number if one number is 16?
Delhi Police H.C.M.17/10/2022(Morning)
(a) 10 (b) 24 (c) 8 (d) 20

Q.132. What is the smallest number greater than 1000 that when divided by any one of the numbers 6, 9, 12, 15, 18

leaves a remainder of 3?
UPSC CSAT (05/06/2022)
(a) 1063 (b) 1073 (c) 1083 (d) 1183

Q.133. What is the least number added to 2483 so that it is completely divisible by 3, 4 ,5 and 6?
SSC GD Constable 17/11/2021 (Morning)
(a) 37 (b) 23 (c) 22 (d) 30

Q.134. The H.C.F. (Highest Common Factor) of 2923 and 3239 is :
CUET PG 15/09/2021 (2nd shift)
(a) 37 (b) 47 (c) 73 (d) 79

Q.135. The smallest number which when increased by 5 is completely divisible by 8 ,11, and 24 is :
HCS CSAT (31/03/2019)
(a) 243 (b) 259 (c) 289 (d) 303

Q.136. The HCF and LCM of two numbers are 2 and 72 respectively. The bigger number is 2 more than twice the smaller number. Find the smaller number.
UP Constable 28/01/2019 (2nd Shift)
(a) 4 (b) 6 (c) 8 (d) 10

Q.137. A number is multiplied by 3,003 and then divided by the LCM of 7, 11 and 13 and then divided by itself. Find the result
UP Constable 27/01/2019 (1st Shift)
(a) 1 (b) 2 (c) 3 (d) 4

Q.138. Aditi, Govind and Pranav take 4 minutes, 5 minutes and 6 minutes respectively to go round a field. If they start walking at 10:00 am. Then at what time will they meet again together at the starting point?
Bihar Police Constable 19/10/2014
(a) 10:15 am (b) 10:30 am
(c) 11:00 am (d) 12:00 pm

Moderate Section

SSC Previous Year Questions

Q.139. The LCM of two prime numbers x and y (x > y) is 533. The value of 4y - x is:
SSC CPO 03/10/2023 (3rd Shift)
(a) 11 (b) 21 (c) 18 (d) 23

Q.140. The HCF and the LCM of two numbers are 5 and 175, respectively. If the ratio of the two numbers is 5 : 7, the larger of the two numbers is _____.
SSC CPO 03/10/2023 (1st Shift)
(a) 75 (b) 35 (c) 45 (d) 25

Q.141. Sanjay wants to exactly measure the lengths 7000 mm, 3850 mm and 12950 mm using a single measuring tape. What will be the greatest possible length (in cm) of the measuring tape?
SSC MTS 11/09/2023 (2nd Shift)
(a) 40 (b) 45 (c) 35 (d) 30

Q.142. The LCM of $\frac{1}{6}, \frac{5}{27}, \frac{4}{15}, \frac{8}{3}$ is:
SSC MTS 08/09/2023 (3rd Shift)
(a) $\frac{40}{3}$ (b) $\frac{3}{28}$ (c) $\frac{5}{28}$ (d) $\frac{40}{5}$

Q.143. Find the greatest two digit number which on dividing 219, 365, 511 leaves the remainders 3, 5, 7, respectively.
SSC MTS 01/09/2023 (3rd Shift)
(a) 63 (b) 82 (c) 53 (d) 72

Q.144. The HCF of two numbers is one-twentieth of their LCM. If one of the numbers is 96 and the difference of the LCM and the HCF is 456, then what is the other number ?
SSC CHSL Tier II (26/06/2023)
(a) 48 (b) 120 (c) 144 (d) 72

Q.145. What is the smallest perfect square which is divisible by both 8 and 12 ?
SSC MTS 20/06/2023 (Afternoon)
(a) 100 (b) 144 (c) 121 (d) 196

Q.146. What is that least perfect square, which is exactly divisible by each of 12, 84 and 24 ?
SSC MTS 15/06/2023 (Evening)
(a) 2304 (b) 7056 (c) 11664 (d) 1764

Q.147. The greatest number which when divides 456 and 553 leaves the remainder as 6 and 3 respectively is:
SSC MTS 12/05/2023 (Evening)
(a) 5 (b) 50 (c) 10 (d) 30

Q.148. What is that greatest four-digit number which when divided by 3 and 4 leaves remainder 2 in each case?
SSC MTS 09/05/2023 (Morning)
(a) 9994 (b) 9996 (c) 9998 (d) 9995

Q.149. The LCM of $x^2 - 8x + 15$ and $x^2 - 5x + 6$ is:
SSC CGL Tier II (03/03/2023)
(a) (x – 2) (x – 3) (x – 5)
(b) (x – 6)² (x + 1) (x – 3)
(c) (x – 6) (x + 1) (x – 3)
(d) (x + 6) (x + 1) (x – 3)

Q.150. The product of the two numbers is 1500 and their HCF is 10. The number of such possible pairs is/are:
SSC CGL Tier II (02/03/2023)
(a) 1 (b) 3 (c) 4 (d) 2

Q.151. What will be the least number which when doubled will be exactly divisible by 15, 18, 25 and 32 ?
SSC CGL 02/12/2022 (2nd Shift)
(a) 3600 (b) 7200 (c) 6400 (d) 3200

Q.152. What is the ratio between the HCF and LCM of the numbers whose LCM is 48 and the product of the numbers is 384 ?
SSC CGL 01/12/2022 (2nd Shift)
(a) 1 : 4 (b) 1 : 6 (c) 1 : 3 (d) 2 : 5

Q.153. The least common multiple of a and b is 42. The LCM of 5a and 11b is :
SSC CPO 09/11/2022 (Morning)
(a) 2310 (b) 4620 (c) 210 (d) 462

Q.154. Six bells commence tolling together at 7 : 59 am. They toll at intervals of 3, 6, 9, 12 and 15 seconds respectively . How many times will they toll together till 8 : 16 am? (excluding the toll at 7 : 59 am)
SSC MTS 25/07/2022 (Evening)
(a) 5 (b) 6 (c) 3 (d) 4

Q.155. 120 apples, 240 oranges and 150 pears are packed in cartons in such a way that each carton has the same number of fruits, each carton contains only one type of fruit and fruit is left unpacked. What is the smallest possible number of cartons needed for the purpose ?
SSC MTS 08/07/2022 (Evening)
(a) 50 (b) 40 (c) 17 (d) 30

Q.156. If $P = 2^8 \times 3^5, Q = 2^3 \times 3^4$, and $R = 3^5 \times 2^7$, then what is the highest common factor of P, Q and R?
SSC MTS 06/07/2022 (Afternoon)
(a) $2^3 \times 3^4$ (b) $2^8 \times 3^5$
(c) $2^2 \times 3^2$ (d) $2^4 \times 3^5$

Q.157. LCM and HCF of two numbers are 90 and 15, respectively. If the sum of the two numbers is 75, find the greater number ?
SSC CGL 21/04/2022 (Evening)
(a) 45 (b) 90 (c) 75 (d) 60

Q.158. Three number are in the proportion of 3 : 8 : 15 and their LCM is 8280. What is their HCF?
SSC CGL 19/04/2022 (Morning)
(a) 60 (b) 69 (c) 75 (d) 57

Q.159. The sum of two numbers is 1215 and their HCF is 81. If the numbers lie between 500 and 700, then the sum of reciprocals of the numbers is
SSC CPO 13/12/2019(Evening)
(a) $\frac{5}{1512}$ (b) $\frac{5}{378}$ (c) $\frac{5}{702}$ (d) $\frac{5}{1188}$

Q.160. Which is the largest six digit number , which when divided by 12, 15, 20, 24 and 30 , leaves the remainder 8,

11, 16, 20 and 26 respectively.
SSC CPO 09/12/2019 (Morning)
(a) 999956 (b) 999960
(c) 999964 (d) 999982

Q.161. The LCM of two numbers x and y is 204 times their HCF. If their HCF is 12 and the difference between the numbers is 60, then x + y = ?
SSC CGL Tier II (13/09/2019)
(a) 660 (b) 426 (c) 852 (d) 348

Q.162. The product of two numbers is 6760 and their HCF is 13. How many such pairs of numbers can be formed?
SSC CPO 16/03/2019 (Evening)
(a) 2 (b) 3 (c) 1 (d) 4

Q.163. An oil merchant has 3 varieties of oil of volumes 432, 594 and 702 respectively. The number of cans of equal size that would be required to fill the oil separately is:
SSC CPO 16/03/2019 (Afternoon)
(a) 13, 15, 17 (b) 8, 11, 13
(c) 8, 13, 15 (d) 6, 9, 11

Railway Previous Year Questions

Q.164. The HCF of $(X^4 - Y^4)$, $(X^8 - Y^8)$ and $(X^2 - Y^2)$ is:
RRC Group D 08/09/2022 (Evening)
(a) (X – Y) (X + Y)
(b) (X - Y) (X + Y) (X - Y) (X + Y)
(c) (X - Y) (X + Y) (X + Y)
(d) (X + Y) (X + Y)

Q.165. The number of students in grades 10,11 and 12 of a school are 384, 256 and 480 respectively . All students were divided into different groups, with no group having students from more than one grade. What is the minimum number of groups that would be formed if all the groups have the same number of students?
NTPC CBT II (16/06/2022) 2nd Shift
(a) 36 (b) 30 (c) 32 (d) 35

Q.166. k is the greatest number which, when divides 2996, 4752 and 7825, the remainder in each case is the same. The product of the digit of k is
NTPC CBT II (10/06/2022) 1st Shift
(a) 12 (b) 84 (c) 72 (d) 108

Q.167. Find the least number which when divided by 20,25,35 and 40 leaves remainders 15,20,30 and 35 respectively.
RRB NTPC CBT - I 31/07/2021 (Evening)
(a) 1240 (b) 1860 (c) 1395 (d) 7265

Q.168. The sum of the digits of the smallest number which, when divided by 18,21,25 and 39 leaves a remainder of 3 in each case is:
RRB NTPC CBT - I 08/03/2021 (Evening)
(a) 21 (b) 18 (c) 39 (d) 25

Q.169. Six bells commence tolling together and toll at the intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In the first 10 minutes, how many times would they have tolled together?
RRB NTPC CBT - I 27/02/2021 (Evening)
(a) 5 times (b) 4 times
(c) 2 times (d) 6 times

Q.170. The HCF and LCM of two numbers is 10^8 and $10^{12}7^3$ Respectively. If one of the numbers is 10^{12}, then the other number is _____.
RRB NTPC CBT - I 11/02/2021 (Evening)
(a) 10×7^3 (b) $10^{10} \times 7^3$
(c) $10^{12} \times 7^3$ (d) $10^8 \times 7^3$

Q.171. Find the greatest number, which when divides 76, 151 and 226 leaves same remainder.
RRB NTPC CBT - I 28/01/2021(Morning)
(a) 75 (b) 78 (c) 70 (d) 76

Q.172. Find three numbers such that their ratio is 3 : 4 : 5 and their HCF is 7.
RRB NTPC CBT - I 16/01/2021 (Morning)
(a) 12; 16; 20 (b) 6; 8 ; 10
(c) 21; 28; 35 (d) 24; 32; 40

Q.173. The greatest number of four digits which is divisible by 15, 20, 25 and 45 is..
RRB NTPC CBT - I 13/01/2021 (Morning)
(a) 9990 (b) 9000 (c) 9900 (d) 9090

Q.174. The largest number which divides 55, 72 and 123 leaving the remainder 3, 7 and 6 respectively are:
RRB NTPC CBT - I 09/01/2021 (Evening)
(a) 13 (b) 117 (c) 66 (d) 26

Q.175. The least number that when divided by 144,108 and 72 leaves the remainder 3 in each case is.
RRB NTPC CBT - I 29/12/2020 (Evening)
(a) 432 (b) 435 (c) 72 (d) 429

Q.176. Find the HCF of $(a^3 + b^3)$, $(a + b)^2$ and $(a^2 - b^2)$
RRB JE 31/05/2019 (Evening)
(a) (a + b) (b) (a - b)
(c) (a + b) (a - b) (d) $(a^3 + b^3)$ $(a^2 - b^2)$

Banking Questions (Memory Based Previous Year)

Q.177. The ratio of two numbers is 3 : 4 and their L.C.M is 144. The sum of number is
SBI Clerk Mains (15/01/2023)
(a) 84 (b) 35 (c) 140 (d) 105

Q.178. A gardener had a number of shrubs to plant in rows. At first he tried to plant 8,then 12 and then 16 in a row but he had always 3 shrubs left with him. On trying 7 he had none left. Find the total number of shrubs.
IBPS PO Pre 15/10/2022 (2nd Shift)
(a) 154 (b) 147 (c) 137 (d) 150
(e) None of these

Q.179. Three girls start jogging from the same point around a circular track and each one completes one round in 24 seconds, 36 seconds and 48 seconds respectively. After how much time will they meet at one point?
IBPS PO Pre 15/10/2022 (2nd Shift)
(a) 2 minutes 20 seconds
(b) 2 minutes 24 seconds
(c) 3 minutes 36 seconds
(d) 4 minutes 12 seconds

Q.180. In a school, 442 boys and 374 girls have been divided into the largest possible equal classes, so that each class of boys numbers the same as each class of girls. What is the number of classes?
RRB Clerk Mains (24/09/2022)
(a) 16 (b) 18 (c) 20 (d) 24

Q.181. A merchant has 140 litres, 260 litres, 320 litres of three kinds of oil. He wants to sell the oil by filling the three kinds separately in tins of equal volume. The volume of such a tin will be
RRB Clerk Pre 13/08/2022 (1st Shift)
(a) 13 litres (b) 16 litres
(c) 20 litres (d) 70 litres

Defence Exams Previous Year Questions

Q.182. Let L be the LCM and H be the HCF of two given numbers. L and H are in the ratio 3 : 2. If the sum of the two numbers is 45, then what is the product of the numbers?
UPSC CDS - II (03/09/2023)
(a) 243
(b) 486
(c) 504
(d) Cannot be determined due to insufficient data

Q.183. What is the LCM of $x^4 + x^2y^2 + y^4, x^3 + y^3, x^3 - y^3$?
UPSC CDS - II (03/09/2023)
(a) $(x^2 - y^2)$ $(x^4 + x^2y^2 + y^4)^2$
(b) $(x^2 - y^2)$ $(x^4 + 2x^2y^2 + y^4)$

(c) $(x^6 - y^6)$
(d) $(x^6 + y^6)$

Q.184. If (x + k) is the HCF of $x^2 + px + q$ and $x^2 + qx + p$, where $p \neq q$, then what is the value of k ?
UPSC CDS - II (04/09/2022)
(a) - 1 (b) 0 (c) $\frac{1}{2}$ (d) 1

Q.185. If the speed of A, B, and C starts walking on a circular ground with 36 km/h, 54km/h, and 18 km/h respectively. If the length of the circular ground is 1200 m then find after how much time they meet at the starting point again.
AFCAT 20/02/2021 (1st Shift)
(a) 120 seconds (b) 240 seconds
(c) 180 seconds (d) 360 seconds

Other Exams Previous Year Questions

Q.186. There are three traffic signals. Each signal changes colour from green to red and then from red to green. The first signal takes 25 seconds, the second signal takes 39 seconds and the third signal takes 60 seconds to change the colour from green to red. The durations for green and red colours are same. At 2:00 p.m, they together turn green. At what time will they change to green next, simultaneously?
UPSC CSAT (28/05/2023)
(a) 4:00 p.m. (b) 4:10 p.m.
(c) 4:20 p.m. (d) 4:30 p.m.

Q.187. HCF of two numbers is 25 and other factors of their LCM are 14 and 15. Sum of the numbers is -
UPPSC CSAT (14/05/2023)
(a) 750 (b) 725 (c) 775 (d) 700

Q.188. The LCM of two numbers is 45 times their HCF and the sum of the LCM and HCF is 1518. If one of the numbers is divided by 16, the quotient is 18 and the remainder is 9. What is the other number?
SSC GD Constable 24/11/2021 (Afternoon)
(a) 495 (b) 363 (c) 330 (d) 165

Q.189. x is the smallest number between 1400 and 1800 which when divided by 5,6,8,9 and 12 leaves the remainder 3 in each case. What will be the remainder if x is divided by 11 ?
Delhi Police Exe. 07/12/2020 (Evening)
(a) 5 (b) 3 (c) 2 (d) 1

Q.190. If the sum of two numbers is 55 and the HCF and LCM of these numbers are 5 and 140 respectively, then what is the sum of the reciprocals of the numbers?
Delhi Police Exe. 28/11/2020 (Afternoon)
(a) $\frac{11}{700}$ (b) $\frac{11}{140}$ (c) $\frac{5}{28}$ (d) $\frac{11}{28}$

Q.191. A milk seller has three types of milk whose volumes are 276, 322 and 414 liters respectively. The seller wants to keep them in minimum number of containers of same capacity without mixing them. Find the capacity of each container and the number of containers required.
DMRC JEE 26/02/2020 (3rd shift)
(a) 46 liters and 22 containers
(b) 276 liters and 22 containers
(c) 322 liters and 46 containers
(d) 46 liters and 23 containers

Q.192. Find the least number of square tiles required to completely pave the floor of a room of 15 m 17 cm long and 9 m 2 cm broad .
DMRC CRA 17/02/2020 (2nd shift)
(a) 824 (b) 784 (c) 764 (d) 814

Q.193. Let x be the greatest number that will divide 703, 1803 and 1473 leaving in each case the same remainder y, the value of $|x - y|$ is:
LMRC JE 16/04/2018 (2nd shift)
(a) 43 (b) 54 (c) 67 (d) 110

Tough Section

SSC Previous Year Questions

Q.194. The LCM of x^2 - 8x + 15 and x^2 - 5x + 6 is:
SSC CPO 05/10/2023 (2nd Shift)
(a) (x + 5)(x + 2)(x + 3)
(b) (x - 5)(x - 2)(x - 3)
(c) (x + 5)(x - 2)(x - 3)
(d) (x - 2)$(x - 3)^2$(x - 5)

Q.195. What is the HCF of $(x^6 + 1)$ and $(x^4 - 1)$?
SSC CPO 05/10/2023 (1st Shift)
(a) $(1+ x^2)$ (b) (1 + x) (c) 1 (d) $(1- x^2)$

Q.196. If the HCF of 45 and 55 is expressible in the form of 55 × 5 + 45m, then what is the value of m?
SSC CPO 04/10/2023 (3rd Shift)
(a) 5 (b) −6 (c) −5 (d) 6

Q.197. If the highest common factor (HCF) of x and y is 15, then the HCF of $36x^2 - 81y^2$ and $81x^2 - 9y^2$ is divisible by
SSC CGL Tier II (06/03/2023)
(a) 135 (b) 120 (c) 180 (d) 90

Q.198. If the sum of two numbers is 126 and their HCF and LCM are 7 and 180, respectively, then the sum of the reciprocals of the two numbers is:
Selection Post 01/08/2022 (3rd Shift)
(a) $\frac{1}{11}$ (b) $\frac{1}{10}$ (c) $\frac{1}{9}$ (d) $\frac{1}{12}$

Q.199. Find the smallest natural number 'x' that must be subtracted from 1800 so that (1800 - x), when divided by 7, 11 and 23, will leave 5 as the remainder in each case.
SSC MTS 26/07/2022 (Evening)
(a) 24 (b) 25 (c) 26 (d) 20

Q.200. Find the HCF of $(4^{315} - 1)$ and $(4^{25} - 1)$.
SSC MTS 26/07/2022 (Morning)
(a) 1 (b) $(4^{25} - 1)$ (c) 1024 (d) 1023

Q.201. The ratio of the LCM of two numbers to the sum of the same two numbers is 12 : 7.If their HCF is 4, what is the product of these two numbers?
SSC MTS 14/07/2022 (Morning)
(a) 192 (b) 172 (c) 196 (d) 169

Q.202. When 1062, 1134 and 1182 are divided by the greatest number x, the reminder in case is y. What is the value of (x - y) ?
SSC CGL Tier II (15/11/2020)
(a) 19 (b) 17 (c) 16 (d) 18

Q.203. Let x be the least number of four digits that when divided by 2, 3, 4, 5, 6 and 7 leaves a remainder of 1 in each case. If x lies between 2000 and 2500, then what is the sum of the digits of x?
SSC CPO 11/12/2019 (Morning)
(a) 9 (b) 15 (c) 10 (d) 4

Q.204. The Highest Common Factor and Lowest Common Multiple of two numbers p and q are A and B respectively. IF A + B = p + q, then the value of $A^3 + B^3$ is :
SSC MTS 09/08/2019 (Evening)
(a) p^3 (b) q^3 (c) $p^3 + q^3$ (d) $p^3 - q^3$

Railway Previous Year Questions

Q.205. While packing birthday caps for a party in packs of 8 or 10, one cap was always left out. How many caps were there if there were more than 250 but less than 300 caps in the lot?
RRC Group D 11/10/2022 (Evening)
(a) 275 (b) 268 (c) 281 (d) 261

Q.206. The LCM and the HCF of two numbers are 5005 and 77, respectively. When one of the two numbers is divided

by 55, the quotient is 18 and the remainder is 11. The other number is:
RRC Group D 26/09/2022 (Evening)
(a) 330 (b) 385 (c) 418 (d) 440

Q.207. The greatest number, which divides 2000 and 2200 to leave 22 and 38 respectively as remainders, is:
RRC Group D 18/09/2022 (Afternoon)
(a) 36 (b) 42 (c) 39 (d) 46

Q.208. If GCD(108, 36) = GCD (x, 72) then what is the minimum possible value of x?
RRC Group D 29/08/2022 (Morning)
(a) 72 (b) 36 (c) 12 (d) 24

Q.209. Find the HCF of (a - b)(a + 2b), $(a^2 - b^2)$(a + 2b), (a + b), $(a^2 - b^2)$, where a > b > 0
NTPC CBT II (17/06/2022) 1st Shift
(a) a + b (b) a + 2b (c) a - 2b (d) a - b

Q.210. Find the HCF of $(3^{45} - 1)$ and $(3^{55} - 1)$.
RRB NTPC CBT - I 17/01/2021 (Morning)
(a) 728 (b) 81 (c) 80 (d) 242

Q.211. The product of the LCM and HCF of two positive numbers is 28 and their difference is 3. The numbers are:
RRB NTPC CBT - I 08/03/2021 (Evening)
(a) 7 and 5 (b) 3 and 5
(c) 4 and 7 (d) 5 and 6

Q.212. Find the least number which when divided by 5 leaves no remainder, when divided by 4 leaves a remainder of 1 but when divided by 6 or 7 leaves a remainder of 5.
RRB NTPC CBT - I 15/02/2021 (Evening)
(a) 400 (b) 450 (c) 425 (d) 430

Banking Questions (Memory Based Previous Year)

Q.213. In a seminar the number of participants in Technology, Economics and Science are 150, 90 and 180 respectively. Find the minimum number of rooms required, where in each room the same number of participants are to be seated and all of them being in the same subject.
IBPS PO Pre 15/10/2022 (1st Shift)
(a) 27 (b) 32 (c) 30 (d) 14
(e) None of these

Q.214. The HCF and LCM of two numbers are 21 and 84 respectively. If the ratio of the two numbers is 1 : 4, then the larger of the two numbers is
RRB Clerk Mains (24/09/2022)
(a) 48 (b) 84 (c) 92 (d) 96

Defence Exams Previous Year Questions

Q.215. What is the HCF of $acx^3 + bcx^2 + adx^2 + acdx + bdx + bcd$ and $adx^3 + acx^2 + bdx^2 + bcx + acdx + bcd$ if HCF (c, d) = 1, c ≠d
UPSC CDS - II (03/09/2023)
(a) bx + c (b) cx + d (c) ax + d (d) ax + b

Other Exams Previous Year Questions

Q.216. The HCF and LCM of two polynomials are (3x + 1) and $(22x^3 - 15x^2 - 9x + 2)$ respectively. If one polynomial is $(6x^2 + 5x + 1)$, then what is the other polynomial?
CGPSC CSAT (13/02/2022)
(a) $11x^2 - 13x + 2$ (b) $11x^2 - 13x - 2$
(c) $11x^2 + 13x + 2$ (d) $11x^2 + 13x - 2$

Answer Key :-

1.(b)	2.(a)	3.(d)	4.(d)
5.(d)	6.(b)	7.(b)	8.(a)
9.(c)	10.(b)	11.(a)	12.(b)
13.(b)	14.(b)	15.(d)	16.(a)
17.(a)	18.(c)	19.(d)	20.(c)
21.(d)	22.(b)	23.(c)	24.(c)
25.(b)	26.(c)	27.(a)	28.(c)
29.(c)	30.(b)	31.(c)	32.(d)
33.(d)	34.(c)	35.(d)	36.(d)
37.(b)	38.(a)	39.(d)	40.(d)
41.(a)	42.(d)	43.(c)	44.(a)
45.(b)	46.(a)	47.(b)	48.(b)
49.(a)	50.(c)	51.(c)	52.(d)
53.(c)	54.(b)	55.(b)	56.(a)
57.(d)	58.(d)	59.(b)	60.(b)
61.(c)	62.(b)	63.(d)	64.(a)
65.(b)	66.(b)	67.(d)	68.(a)
69.(b)	70.(a)	71.(b)	72.(b)
73.(d)	74.(c)	75.(a)	76.(b)
77.(d)	78.(d)	79.(a)	80.(c)
81.(a)	82.(d)	83.(a)	84.(c)
85.(b)	86.(a)	87.(b)	88.(b)
89.(c)	90.(c)	91.(d)	92.(c)
93.(c)	94.(b)	95.(a)	96.(c)
97.(a)	98.(a)	99.(a)	100.(a)
101.(a)	102.(c)	103.(b)	104.(c)
105.(d)	106.(a)	107.(d)	108.(d)
109.(c)	110.(b)	111.(b)	112.(a)
113.(b)	114.(d)	115.(d)	116.(d)
117.(c)	118.(a)	119.(a)	120.(c)
121.(a)	122.(d)	123.(b)	124.(c)
125.(d)	126.(c)	127.(a)	128.(d)
129.(d)	130.(b)	131.(d)	132.(c)
133.(a)	134.(d)	135.(b)	136.(c)
137.(c)	138.(c)	139.(a)	140.(b)
141.(c)	142.(a)	143.(d)	144.(b)
145.(b)	146.(b)	147.(b)	148.(c)
149.(a)	150.(d)	151.(a)	152.(b)
153.(a)	154.(a)	155.(c)	156.(a)
157.(a)	158.(b)	159.(a)	160.(a)
161.(d)	162.(a)	163.(b)	164.(a)
165.(d)	166.(d)	167.(c)	168.(a)
169.(d)	170.(d)	171.(a)	172.(c)
173.(c)	174.(a)	175.(b)	176.(a)
177.(a)	178.(b)	179.(b)	180.(d)
181.(c)	182.(b)	183.(c)	184.(a)
185.(b)	186.(b)	187.(b)	188.(d)
189.(c)	190.(b)	191.(a)	192.(d)
193.(c)	194.(b)	195.(a)	196.(b)
197.(a)	198.(b)	199.(a)	200.(d)
201.(a)	202.(d)	203.(d)	204.(c)
205.(c)	206.(b)	207.(d)	208.(b)
209.(d)	210.(d)	211.(c)	212.(c)
213.(d)	214.(b)	215.(d)	216.(a)

Solutions :-

Sol.1.(b) Let numbers be a and b
$a \times b$ = HCF × LCM
$a \times b$ = 5 × 60 -----(1)
$a + b$ = 60 -----(2)
Now,
$$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} \Rightarrow \frac{60}{5 \times 60} = \frac{1}{5}$$

Sol.2.(a) According to the question,
HCF of 20, 30 and 40 will be 10
So the required no. of pieces will be
$$= \frac{20}{10} + \frac{30}{10} + \frac{40}{10} = 9$$

Sol.3.(d) According to the question,
1105 = 17 × 1st number
1st number = 65
Formula:- 1st no. × 2nd no. = LCM × HCF
65 × 2nd no. = 1105 × 5
2nd no. = 85
So the no. will be 65 and 85

Sol.4.(d) L.C.M of 2,4,6 and 8 = 24
When we divide 1351 by 24 we get 7 as remainder.
So, the required number = 24 - 7 = 17

Sol.5.(d) According to the question,
1 m = 100 cm
HCF of (600, 525,1250)= 25 cm or 0.25 m
So the greatest possible length will be 0.25 m

Sol.6.(b) $(x^3 - 8) = (x - 2)(x^2 + 2x + 4)$
$(x^3 - 6x^2 + 12x - 8) = (x - 2)^3$
and $(x^3 - 4x^2 + 4x) = x(x - 2)^2$
HCF of $(x^3 - 8)$, $(x^3 - 6x^2 + 12x - 8)$ and $(x^3 - 4x^2 + 4x) = (x - 2)$

Sol.7.(b) Required time = LCM of 50 , 75 and 100 ⇒ 300 = 5 minutes

Sol.8.(a) Required least number
= LCM (19, 36, 54) + 4 = 2052 + 4 = 2056

Sol.9.(c) According to the question,
1st number = 627 - 2 = 625
2nd number = 15630 - 5 = 15625
3rd number = 3128 - 3 = 3125
HCF of 625, 15625 and 3125 = 625
So the required number will be 625.

Sol.10.(b) LCM of pq = r
LCM of p^2q and $pq^2 = p^2q^2$
⇒ pq × pq = pqr ∵ (pq = r)

Sol.11.(a) According to the question,
LCM × HCF = 1st number × 2nd number
1st number × 2nd number = 12 × 2 = 24
Mean proportional of numbers
$= \sqrt{24} = 2\sqrt{6}$

Sol.12.(b) LCM(12, 15, 18) = 180
Largest 4 digit number = 9999
$\frac{9999}{180}$ → Remainder = 99
So, largest 4 - digit number divisible by 12, 15, 18 → 9999 − 99 = 9900

Sol.13.(b)
L.C.M. × H.C.F. = 1st no. × 2nd no.
693 × 11 = 77 × 2nd no.
2nd no. = $\frac{693 \times 11}{77}$ = 99

Sol.14.(b) According to the question,
Length of the room = 600 cm
Breadth of the room = 480 cm
Height of the room = 360 cm
HCF of 600, 480 and 360 = 120 cm
So the length of highest tape will be 120 cm (1m 20 cm)

Sol.15.(d) LCM (44 , 10 , 5) = 220
HCF(50 , 75) = 25
According to question,
Required ratio = 220 : 25 = 44 : 5

Sol.16.(a) According to the question,
LCM of $\frac{1}{22}, \frac{1}{16} = \frac{1}{2}$

Sol.17.(a)
HCF of fraction = $\frac{HCF\ of\ numerator}{LCM\ of\ denominator}$
HCF$(\frac{3}{4}, \frac{15}{16}, \frac{18}{5}) = \frac{HCF(3,15,18)}{LCM(4,16,5)} = \frac{3}{80}$

Sol.18.(c)
Smallest number will be ⇒ 6 × 4 = 24

Sol.19.(d) the prime factorization.
HCF of $(a^m - 1)$ and $(a^n - 1)$ is
$[(a^{HCF(m,n)} - 1)]$...e.q(1)
Here,
$(3^{29} - 9) = 3^2(3^{27}\text{-}1), (3^{38} - 9)$
$= 3^2(3^{36}\text{-}1)$
From equation...(1)
$= 3^2[(3^{HCF\,(27,36)}\text{-}1)]$
HCF (27, 36) = 9
Now, HCF = $3^2(3^9 - 1) = (3^{11} - 9)$

Sol.20.(c) LCM × HCF = First number × Second number
LCM × 12 = 2160 ⇒ LCM = 180
Let the two numbers are $12a$ and $12b$
LCM of two numbers = $12ab$
$12ab = 180 \Rightarrow ab = 15$
Possible value of a and b = (3 , 5) and (1 , 15)
Hence, numbers are $12a = 12 \times 3 = 36$ and $12b = 12 \times 5 = 60$
$(36^2 + 60^2) = 4896$
Required mean = $\frac{(36 + 60)}{2}$ = 48

Sol.21.(d) As we know,
HCF and LCM of any numbers has one common factor
So, answer should be factor of 240
Hence, required answer = 35

Sol.22.(b) 1026 = 2 × 3 × 3 × 3 × 19
2268 = 2 × 2 × 3 × 3 × 3 × 7 × 3
2430 = 2 × 3 × 3 × 3 × 3 × 3 × 5
Now, Largest common divisor
= 2 × 3 × 3 × 3 = 54

Sol.23.(c) LCM of (9, 10, 12, 25) = 900
It is given that total no of students when divided by either 9 or 10 or 12 or 25 each such that exactly 4 are always left out.
So, it will be in the form of 900k + 4, where k is constant.
Also, it is given that when dividing the students into teams of 11 each, no one is left out.
It implies that 900k + 4, must be divisible by 11.
Putting k = 2 , we get 900 × 2 + 4 = 1804, divisible by 11.
Therefore,
No of 12 students group = $\frac{1804}{12}$ = 150

Sol.24.(c) Let the two positive integers be a = 2, and b = 3
Now, on putting the respective values of a & b in the given equation, we get
HCF of $(\frac{2}{HCF\ of\ (2,3)}, \frac{3}{HCF\ of\ (2,3)})$
HCF of $(\frac{2}{1}, \frac{3}{1})$ ⇒ HCF of (2, 3) = 1
Hence, required answer = 1

Sol.25.(b)
LCM of $a^3b - ab^3$,$a^3b^2 - a^2b^3$, ab (a - b)
$a^3b - ab^3 = ab(a^2 - b^2)$
$a^3b^2 - a^2b^3 = a^2b^2(a - b)$
ab (a - b) = $ab(a - b)$
Hence, L.C.M = $a^2b^2(a^2 - b^2)$

Sol.26.(c) The greatest length of tape = HCF of 62, 186 and 279
Prime factorization of the given no's :
62 = **31** × 2, 186 = **31** × 6, 279 = **31** × 9
So, the HCF of the given no's is 31

Sol.27.(a) Let the numbers be a and b
According to question,
(a + b) = 45 .....(1)
(a − b) = $\frac{45}{9}$ = 5 .....(2)
After solving both equations, we get
a = 25 and b = 20
Therefore,
L.C.M(25, 20) = 100

Sol.28.(c) LCM (12, 15, 25 and 60) = 300 then, least four digit number which is divided by 300 is 1200

Sol.29.(c) Given, tailor has 22 m cloth
As per question 1 meter cloth has
= 5 pieces
So 22 meter cloth has = 5 × 22
= 110 pieces.

Sol.30.(b) If a and b are co-prime then LCM = a × b

Sol.31.(c) HCF of numerators
(2, 4 and 3) = 1
LCM of the denominators(3,5 and 2) = 30
HCF of $\frac{2}{3}, \frac{4}{5}$ and $\frac{3}{2} = \frac{1}{30}$

Sol.32.(d)
3 m 96 cm , 5 m 28 cm and 7 m 92 cm
Or 396 cm , 528 cm and 792 cm
H.C.F of 396 , 528 and 792
396 = 2 × 2 × 3 × 3 × 11
528 = 2 × 2 × 2 × 2 × 3 × 11
792 = 2 × 2 × 2 × 3 × 3 × 11
H . C .F. = 2 × 2 × 3 × 11 = 132
Hence, the required greatest possible scale length = 1 m 32 cm

Sol.33.(d) LCM of 45, 75 and 90 = 450
450 second = 7.5 min
So, next change = 9:30 + 7.5 min
= 9 : 37 : 30 am

Sol.34.(c) 588 = 2 × 2 × 3 × 7 × 7
Now, by options 35 cannot be the H.C.F of 588 because 5 is not a factor of 588.

Sol.35.(d)
Let the numbers are 5x, 6x and 8x.
120x = 1200 ⇒ $x = 10$
Sum of the numbers = 5x + 6x + 8x
= 50 + 60 + 80 = 190

Sol.36.(d) HCF of the number of teachers (112 , 144 and 192) = 16
ATQ,
Minimum number of rooms
$= \frac{112}{16} + \frac{144}{16} + \frac{192}{16} \Rightarrow 7 + 9 + 12 = 28$

Sol.37.(b)
L.C.M × H.C.F = Product of two number
⇒ L.C.M = $\frac{8410}{29}$ = 290

Sol.38.(a)
L.C.M of 4 , 8 , 12, and 24 = 24 minutes
After every 24 minutes four bells will ring together .
Now , no. of times they will ring in 4 hr
$= \frac{4 \times 60}{24}$ = 10 times

Sol.39.(d) For same remainder, we have to find the HCF of the difference between the given numbers.
95 - 57 = 38 , 211 - 95 = 116 ,
211 - 57 = 154
HCF of 38 , 116 and 154 = 2
Therefore option (d) will be the right answer.

Sol.40.(d) L.C.M of 3, 4, 5, 6 = 60

```
60 ) 2488 ( 41
    -240
     88
    -60
     28
```

60 - 28 = 32
32 must be added to 2488.

Sol.41.(a) 108 = 3 × 4 × 9
144 = 4 × 4 × 9
H.C.F of 108 and 144 = 4 × 9 = 36

Sol.42.(d) A number that is divisible only by itself and 1 is called prime number
Highest common factor (HCF) of K1 and K2 = 1
And least common multiple (LCM)
= K1 × K2
Then the product = K1 × K2

Sol.43.(c) P = $2^5 \times 3^8$ and $Q = 2^3 \times 3^K$
H.C.F is $2^3 \times 3^3$ So, K = 3

Sol.44.(a) The time when the traffic lights changed simultaneously after every interval = LCM of 48, 72, 108 = 432 sec = 7 min 12 sec
So, the required time -
= 8 : 20 + 7 min 12 sec = 8 : 27 : 12 a.m

Sol.45.(b)
H.C.F of $3x^2yz$, $5xy^2z$, $12x^2y^2z^3 = xyz$

Sol.46.(a) LCM of 80 and 120 = 240 min
So, they will meet after 240 min or 4 hours
So, required time = 6 pm + 4 hr. = 10 pm

Sol.47.(b) 72 = 2 × 2 × 2 × 3 × 3
108 = 2 × 2 × 3 × 3 × 3
300 = 2 × 2 × 3 × 5 × 5
LCM = $2^3 \times 3^3 \times 5^2$
We should multiply above LCM by 5 to get the smallest perfect cube.
LCM = $2^3 \times 3^3 \times 5^2 \times 5 = 27000$

Sol.48.(b) LCM (15, 24, 28, 32) = 3360
3360 × 3 = 10080
Required number = 10080 + 7 = 10087

Sol.49.(a) since, the given no's are prime no's. So, the HCF of (A, B) = 1 and LCM of (A, B) = A × B = AB
According to the question,
A × B = 209 = 19 × 11
So, A = 19 and B = 11 (∵ A > B)
Hence, $A^2 - B = 19^2 - 11 = 361 - 11 = 350$

Sol.50.(c) Let the LCM and HCF of the two no's be L and H respectively
Then, L + H = 512 ---------(1)
and, L - H = 496 ---------(2)
Adding eqn (1) and (2) we have :
L = $\frac{512 + 496}{2} = \frac{1008}{2}$ = 504
Now, putting the value of L in equation (1),
H = 512 - 504 = 8
Product of two numbers = LCM × HCF
⇒ 72 × y = 8 × 504
⇒ y = $\frac{8 \times 504}{72}$ = 56

Sol.51.(c) Required length = H.C.F. of 495 cm, 900 cm, and 1665 cm.
495 = $3^2 \times 5 \times 11$, 900 = $3^2 \times 2^2 \times 5^2$, 1665 = $3^2 \times 5 \times 37$
H.C.F. ($3^2 \times 5$) = 45.
Hence, required length = 45cm.

Sol.52.(d) H.C.F (621, 644, 690) = 23
Required number of bottles
$= \frac{621 + 644 + 690}{23} = \frac{1955}{23}$ = 85

Sol.53.(c) LCM(8, 10, 12, 15, 20) = 120
When we divide 1000 by 120 we get reminder 40
Then , Smallest four digit number which is divisible by 8,10,12,15 and 20)
⇒ 1000 + 120 − 40 = 1080
Therefore , Smallest four digit number which is divisible by 8, 10, 12, 15 and 20 and leaves the remainder 7
⇒ 1080 + 7 = 1087

Sol.54.(b) HCF of (1295, 385) = 35
Area of each square tile = (35 × 35) cm^2
So,
least number of square tiles required
$= \frac{1295 \times 385}{35 \times 35}$ = 407

Sol.55.(b) Total number of odd days
= LCM (5, 24, 9) = 360 days
Net odd days = 360 - (51 × 7) = 360 - 357 = 3 odd days .....(As 7 odd days makes a week)
So, the day of week on which all three of them will meet again = Sunday + 3 odd days = Wednesday.

Sol.56.(a) The HCF of the first 100 natural numbers is 1 .
[because there are prime numbers 2, 3, 5, ..which can't have factors other than 1]

Sol.57.(d) X + Y = 40 ------ (i)
X - y = 20 ----- (ii)
From equation (i) & (ii)
X = 30 and Y = 10
Then HCF of 30 and 10 = 2 × 5 = 10

Sol.58.(d) HCF of any two consecutive natural number = 1

Sol.59.(b)
LCM × HCF = Product of two numbers
⇒ c × HCF = a × b ⇒ HCF = $\frac{ab}{c}$

Sol.60.(b)
$\sqrt[2]{169} = 13$, $\sqrt[3]{27} = 3$, $\sqrt[3]{64} = 4$, $\sqrt[2]{144} = 12$
LCM of (13, 3, 4, 12) = 156

Sol.61.(c) H.C.F. of 24 and 144 = 24
A/Q, 10p + 4 = 24 ⇒ 10p = 20 ⇒ p = 2

Sol.62.(b) The L.C.M of any two consecutive positive integers x and x + 1 is always the multiple of those two numbers = x(x + 1);
Example- the L.C.M of 6, 7 = 42.

Sol.63.(d) LCM of $\frac{2}{3}$, $\frac{4}{9}$, $\frac{8}{15}$ and $\frac{10}{21}$.
$= \frac{LCM\ of\ 2\ ,\ 4\ ,\ 8\ ,\ 10}{HCF\ of\ 3\ ,\ 9\ ,\ 15\ ,\ 21} = \frac{40}{3}$

Sol.64.(a) LCM of (15, 18, 36) = 180
Number can be written as 180k + 9,which is divisible by 11.
Now, putting K = 6 we get :
180 × 6 + 9 = 1080 + 9 = 1089
∴ Required Sum = 1 + 0 + 8 + 9 = 18

Sol.65.(b) 165 = 11 × 5 × 3
176 = 11 × 16 , 385 = 11 × 5 × 7

and 495 = 11 × 5 × 9
LCM of the given no's =
k = 11 × 16 × 5 × 7 × 9 = 55,440
And the HCF of no's = 11
When 55,440 is divided by 11(HCF of the given no's), the quotient is 5040.

Sol.66.(b) HCF of $\frac{2}{3}, \frac{8}{9}, \frac{16}{81}$ and $\frac{10}{27}$
$= \frac{HCF\ OF\ (2, 8, 16, 10)}{LCM\ OF\ (3, 9, 81, 27)} = \frac{2}{81}$
LCM of $\frac{2}{3}, \frac{8}{9}, \frac{16}{81}$ and $\frac{10}{27}$
$= \frac{LCM\ \ OF\ (2, 8, 16, 10)}{HCF\ \ OF\ (3, 9, 81, 27)} = \frac{80}{3}$
Hence, HCF and LCM of the fractions be $\frac{2}{81}$ and $\frac{80}{3}$

Sol.67.(d) H.C.F.
$\left(a^3b^3c^3,\ a^2b^2c^2,\ abc, a^2bc\right)$ = abc

Sol.68.(a) Let the numbers be
$1x$, $2x$ and $3x$ (x = HCF) So, numbers be
1 × 12 = 12, 2 × 12 = 24, 3 × 12 = 36

Sol.69.(b) According to the question,
LCM of
$\frac{15}{100}, \frac{18}{100}, \frac{45}{100} = \frac{90}{100} = 0.9$

Sol.70.(a) According to the question,
3888 = 81 × 12 × 4, 3969 = 81 × 7 × 7
So the HCF of 3888 and 3969 will be 81

Sol.71.(b) 15 = 3 × 5, 24 = 2 × 2 × 2 × 3,
35 = 5 × 7, 54 = 2 × 3 × 3 × 3
L.C.M of 15, 24, 35, 54
$= 2^3 \times 3^3 \times 5 \times 7 = 7560$

Sol.72.(b) LCM (3, 5, 9) = 45
Now, remainder = $\frac{999}{45} = 9$
So, required largest three digit number
= (999 − 9) + 2 = 992

Sol.73.(d) Maximum capacity of container = HCF (850, 680) = 170 litres

Sol.74.(c) 513 = 3 × 3 × 57
1017 = 3 × 3 × 113
So, H.C.F.(513, 1017) = 3 × 3 = 9

Sol.75.(a) According to question,
HCF(0.25, 1.25) = HCF$\left(\frac{1}{4}, \frac{5}{4}\right)$
$= \frac{HCF\ of\ numerator}{LCM\ of\ denominator} = \frac{1}{4} = 0.25$

Sol.76.(b) HCF of 2.7 and 20.25,
= HCF of $\frac{270}{100}, \frac{2025}{100} = \frac{135}{100} = 1.35$

Sol.77.(d)
HCF$\left(\frac{3}{8}, \frac{4}{9}\right) = \frac{HCF\ of\ 3\ and\ 4}{LCM\ of\ 8\ and\ 9} = \frac{1}{72}$

Sol.78.(d) **Formula :-**
1st number × 2nd number = LCM × HCF
6552 = LCM × 6 ⇒ LCM = 1092

Sol.79.(a) Let numbers be $2x$, $3x$ and $5x$
According to the question,
$(2 \times 3 \times 5)x = 60 \Rightarrow x = 2$
∴ Numbers = 4, 6 and 10
HCF(4, 6, 10) = 2

Sol.80.(c) The number which is divided by 14, 18 and 36 → LCM(14, 18, 36) = 252
Remainder = 1{given}
So, Required number = 253

Sol.81.(a) LCM of $\frac{5}{33}, \frac{25}{11}, \frac{20}{55}, \frac{15}{77}$
$\Rightarrow \frac{LCM\ of\ 5, 25, 20, 15}{HCF\ of\ 33, 11, 55, 77} = \frac{300}{11}$

Sol.82.(d) LCM(12, 25, 45) = 900
Remainder $\frac{9999}{900} = 99$
Required number = 9999 − 99 = 9900

Sol.83.(a)
Product of two co - prime number = 483
HCF of co - prime numbers always be 1
So, least common multiple of both numbers = 1 × 483 = 483

Sol.84.(c) 1.05 = 0.07 × 3 × 5
6.23 = 0.07 × 89
HCF(1.05, 6.23) = 0.07

Sol.85.(b) H.C.F of 77, 110 and 121 = 11
So the maximum number of pieces
$= \frac{77}{11} + \frac{110}{11} + \frac{121}{11} = 7 + 10 + 11 = 28$

Sol.86.(a) The HCF of two prime numbers is always 1.

Sol.87.(b) HCF of $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}$ and $\frac{7}{8}$
$\Rightarrow \frac{HCF\ of\ (1, 3, 5, 7)}{LCM\ of\ (2, 4, 6, 8)} = \frac{1}{24}$

Sol.88.(b) Let the number be 3x and 8x, then the L.C.M. will be 3 × 8 × x.
According to the question,
120 = 24 x ⇒ x = 5
Now, sum of the number = 3x + 8x
= 11x = 11 × 5 = 55

Sol.89.(c)
wires in cm = 1054cm and 1156cm
HCF of 1054 and 1156 = 34
Therefore, maximum value of x = 34

Sol.90.(c) First time of meeting of all of them running on a circular track = LCM of (400, 600, 720,900)
$400 = 2^4 \times 5^2, 600 = 2^3 \times 3 \times 5^2$
$720 = 2^4 \times 3^2 \times 5, 900 = 3^2 \times 5^2 \times 2^2$
LCM of (400, 600, 720, 900)
$= 2^4 \times 3^2 \times 5^2 = 3600$ sec

Sol.91.(d) 460 - 26 = 434, 491 - 26 = 465
553 - 26 = 527
Now, HCF of 434, 465 and 527
434 = 2 × 7 × 31, 465 = 3 × 5 × 31
527 = 17 × 31, So, the required HCF = 31

Sol.92.(c) Lowest power of 2 is 3 and lowest power of 3 is 2 so, the highest common factor of $2^3 \times 3^4$ and $2^5 \times 3^2$ is $2^3 \times 3^2$.

Sol.93.(c) LCM of (24, 36, 54) = 216
When the greatest 4-digit no i.e.9999 is divided by 216 leaves remainder 63.

```
216)9999(46
   -864
   1359
  -1296
     63
```

Required number = 9999 - 63 = 9936

Sol.94.(b) $\frac{5}{6}, \frac{6}{5}$ and $\frac{3}{2}$
L.C.M = $\frac{L.C.M\ of\ numerators}{H.C.F\ of\ denominators} = 30$

Sol.95.(a) 7140 = 3 × 4 × 5 × 7 × 17
13200 = 2 × 2 × 2 × 2 × 3 × 5 × 5 × 11
So, the highest common prime factor is 5.

Sol.96.(c) Other number
$= \frac{L.C.M \times H.C.F}{first\ number} = \frac{459 \times 3}{51} = 27$

Sol.97.(a) A pair of number whose HCF is 1 called the pair of co-prime numbers
HCF of 81 and 16 = 1
therefore, option (a) is the right answer

Sol.98.(a) The least number will be LCM of 8 and 12
So LCM of 8 and 12 = 24
Required value = 24 × 5 = 120

Sol.99.(a) Co-prime numbers are those whose H.C.F is 1
By options, H.C.F. of (17, 23) = 1

Sol.100.(a) $2^3 \times 3^2 \times 5$, $2^2 \times 5^2 \times 7$ and $3^3 \times 5^2 \times 7^2$
L.C.M = $2^3 \times 3^3 \times 5^2 \times 7^2$

Sol.101.(a) The HCF of $\sqrt{64}$ and 16 = 8
The LCM of $\sqrt{64}$ and 16 = 16
The ratio of the HCF to the LCM of the numbers $\sqrt{64}$ and 16 = $\frac{8}{16} = \frac{1}{2} = 1 : 2$

Sol.102.(c) LCM of prime numbers
= product of numbers
So, the LCM of p and q is pq, then the numbers of p, q must be prime.

Sol.103.(b) HCF of co prime numbers =1
Product of two numbers = LCM × HCF
29 × 2nd number = 638 × 1

2nd number = $\frac{638}{29}$ = 22

Sol.104.(c) Product of two numbers = HCF $\times LCM$ = 36
Let the numbers be a and b
ab = 36
And a - b = 5 ⇒ a = 5 + b
Put the value of 'a' in the first equation
(5 + b) b = 36 = 9 × 4
On comparing both sides, we get
b = 4 , a = 5 + 4 = 9

Sol.105.(d)
Product of two numbers = HCF × LCM
32 × 2nd number = 8 × 96
2nd number = $\frac{8 \times 96}{32} = 24$

Sol.106.(a) 18 apple trees, 21 mango trees and 39 orange trees
Total number of trees = 78
HCF (18 , 21 , 39) = 3
Now ,
minimum number of rows = $\frac{78}{3}$ = 26

Sol.107.(d) LCM of $\sqrt{36}$ and $\sqrt{64}$
= LCM of 6 and 8 = 24

Sol.108.(d)
LCM of (7, 14, 28, 35, 42) = 420

Sol.109.(c) As we know product of any two numbers = product of LCM and HCF of those two numbers ;
So, the product of LCM and HCF of 18 and 42 = 18 × 42 = 756

Sol.110.(b)
HCF = $\frac{HCF\ of\ (2,4,8,10)}{LCM\ of\ (3,9,15,21)} = \frac{2}{315}$

Sol.111.(b) 1001 = 7 × 11 × 13
819 = 7 × 3 × 3 × 13
Required number of students = H.C.F. of 1001 and 819 = 91.

Sol.112.(a)
Numbers be 0.63, 1.05 and 2.1
Multiplying each number by 100
Then, numbers = 63 , 105 , 210
63 = 3 × 3 × 7 , 105 = 3 × 5 × 7,
210 = 2 × 3 × 5 × 7
Now, LCM(63 , 105 , 210)
= 2 × 3 × 3 × 5 × 7 = 630
Then , LCM (0.63 , 1.05 , 2.10) = 6.30
And , HCF (63 , 105 , 210) = 3 × 7 = 21
Then , HCF (0.63 , 1.05 , 2.10) = 0.21
Hence, HCF and LCM be 0.21 and 6.30 respectively

Sol.113.(b) 321 = 107 × 3,
428 = 107 × 2 × 2 , 642 = 107 × 2 × 3
Required No. = HCF(321, 428, 642) = 107

Sol.114.(d)
HCF OF co prime number always be 1
So, LCM = 1 × 119 = 119

Sol.115.(d) Biggest measure = H.C.F. of (372, 434, 465) = 31 kg.

Sol.116.(d) Biggest measure = H.C.F. of (403, 434, 465) = 31 kg.

Sol.117.(c) Largest size of the tile = H.C.F of 378 cm and 525 cm = 21 cm.

Sol.118.(a) LCM (25 , 50 , 75) = 150
Now, on dividing $\frac{43582}{150}$, quotient be 290 and remainder 82
Hence, required number
= 291 × 150 = 43650
Or
= 43582 + (150 - 82) = 43650

Sol.119.(a) Required time = LCM of (200, 250 and 300) = 3000 days
Hence, after 3000 days they all come relatively to the same position as at a certain point of time in their orbits.

Sol.120.(c)
H.C.F. of 10857 and 15087 is 141
Required , Least number of pieces
= $\frac{10857}{141} + \frac{15087}{141}$ = 77 + 107 = 184

Sol.121.(a)
Length of room = 15m 91cm = 1591 cm
Breadth of room = 9 m 46 cm = 946 cm
Now , HCF of 1591 and 946 = 43
Area of square tiles = 43 × 43
Area of room = 1591 × 946
So, the required no. of square tiles
= $\frac{1591 \times 946}{43 \times 43}$ = 814

Sol.122.(d) According to the question
HCF of $\frac{3}{5}, \frac{6}{25}, \frac{9}{20}, \frac{27}{50} = \frac{3}{100}$ ⇒ x
LCM of $\frac{3}{5}, \frac{6}{25}, \frac{9}{20}, \frac{27}{50} = \frac{54}{5}$ ⇒ y
After going through all the option, option (d) satisfied the given value
Hence, y = 360x

Sol.123.(b) According to the question
If a and b are prime number than
HCF of P and Q (ab^2 and a^2b) = ab
LCM of P and Q (ab^2 and a^2b) = a^2b^2

Sol.124.(c) LCM(12, 15 , 18) = 180
Now, remainder = $\frac{10000}{180}$ = 100
So, required number
= 10000 + (180 - 100) = 10080

Sol.125.(d) Let the number be 3x, 4x and 5x and their L.C.M. will be 60x
ATQ,
60x = 2400, ⇒ x = 40
Then the largest number = 5x ⇒ 200

Sol.126.(c) LCM(5, 10, 15, 18, 20) = 180
90 min. = 5400 second
So, bells tolling together in 90 min.
= $\frac{5400}{180}$ = 30 times

Sol.127.(a)
Let the numbers = 47a, and 47b
then, 47a × 47b = 47 × 2585
ab = 55
Now, co-primes with product 55 are (11, 5)
So the numbers are (11 × 47) and (5 × 47)
Sum of numbers = 517 + 235 = 752

Sol.128.(d) Let the H.C.F x
Then, the number be $2x$, $3x$ and $4x$
According to question,
$2x + 3x + 4x = 549$
H.C.F. $(x) = 61$

Sol.129.(d) L.C.M. of prime numbers = product of numbers
ab = 667
⇒ Prime factor of 667 = 23, 29
a = 29 and b = 23 { ∵ (a > b)
5a - 6b = (5 × 29) - (6 × 23) = 7

Sol.130.(b) According to the question,
L.C.M (45, 75, 90) = 450 sec
= 7 min 30 sec
Required time = 7 : 27 : 45 hours

Sol.131.(d) Let the other no be x
ATQ,
80 × 4 = 16 × x
320 = 16x ⇒ $x = \frac{320}{16}$ = 20

Sol.132.(c) LCM (6, 9, 12, 15, 18) = 180
So, required smallest number
= 180 × 6 + Remainder = 1080 + 3 = 1083

Sol.133.(a) LCM of (3, 4, 5, 6) = 60
When 2483 is divided by 60 leaves remainder 23
So, the required no = 60 - 23 = 37

Sol.134.(d) 2923 = 37 × 79 ,
3239 = 41 × 79
So, HCF (2923 , 3239) = 79

Sol.135.(b) LCM (8, 11, 24) = 264
Hence, the required smallest number
= 264 - 5 = 259

Sol.136.(c) Let the smaller number = x
Bigger number = $2x + 2$
L.C.M × H.C.F= 1st number × 2nd number
72 × 2 = x × $(2x + 2)$
$144 = 2x^2 + 2x \Rightarrow 2x^2 + 2x - 144 = 0$
$2x\ (x + 9) - 16(x + 9) = 0 \Rightarrow x = \frac{16}{2} = 8$
So the smaller number (x) = 8

Sol.137.(c) Let the number = x,

After multiplying by 3003 = $3003x$
LCM of 7, 11, 13 = 1001
According to the question,
$\frac{3003x}{1001}$ = 3x, When 3x divided by x then result will be = 3

Sol.138.(c) According to question,
L.C.M (4, 5, 6) = 60 min
Required time = 11 : 00 am

Sol.139.(a) L.C.M = 533
As we know that L.C.M of two prime numbers is always the product of the two prime numbers
So, numbers = 13 and 41
Hence, 4y - x = 13 × 4 - 41 = 52 - 41 = 11

Sol.140.(b) Let the numbers are 5x and 7x
According to question, H.C.F = x
H.C.F = 5 (given)
So, larger number = 5 × 7 = 35

Sol.141.(c)
HCF of 7000, 3850 and 12950
7000 = 350 × 20 , 3850 = 350 × 11
12950 = 350 × 37
So the maximum length will be
= 350 mm or 35 cm

Sol.142.(a) Given :-
$\frac{1}{6}, \frac{5}{27}, \frac{4}{15}, \frac{8}{3}$
LCM of $(\frac{1}{6}, \frac{5}{27}, \frac{4}{15}, \frac{8}{3})$
$= \frac{LCM\ of\ 1, 5, 4, 8}{HCF\ of\ 6, 27, 15, 3} = \frac{40}{3}$

Sol.143.(d) (219 − 3) , (365 − 5) , (511 − 7) will be exactly divisible by that two digit number
Required number = HCF of 216, 360, 504
= 72

Sol.144.(b) Let ,
L.C.M. be 20 units then H.C.F. be 1 unit.
According to the question ,
Difference (19 units) = 456 ⇒ 1 unit = 24
Now , L.C.M. × H.C.F. = 1st no. × 2nd no.
$(20 \times 24) \times (1 \times 24)$ = 96 × 2nd no.
⇒ 2nd no. = $\frac{(20 \times 24) \times (1 \times 24)}{96}$ = 120

Sol.145.(b) Smallest number that is divisible by 8 and 12 will be 24
Required number = 24 × 6 = 144

Sol.146.(b) According to question,
LCM(12, 84, 24) = 168 = 7 × 2 × 2 × 2 × 3
To make it a perfect square it must be multiplied by 7 × 2 × 3 = 42
Then least perfect square= 168 × 42 = 7056

Sol.147.(b) According to the question,
Number that completely divisible,
456 − 6 = 450
553 − 3 = 550
According to the option 50 is the largest number that divides 450 and 550 completely.

Sol.148.(c) LCM(3, 4) = 12
Remainder = $\frac{9999}{12}$ = 3
Greatest four digit number which is completely divisible by 12
= 9999 − 3 = 9996
Now, greatest four-digit number which when divided by 3 and 4 leaves remainder 2
So, required number = 9996 + 2 = 9998

Sol.149.(a)
$x^2 - 8x + 15 = (x-3)(x-5)$
$x^2 - 5x + 6 = (x-3)(x-2)$
Hence , Required L.C.M.
$= (x-3)(x-5)(x-2)$

Sol.150.(d) Let the numbers be 10x and10y
Then , $10x \times 10y$ = 1500 ⇒ xy = 15
Possible value of x and y are
⇒ (1 , 15) and (3 , 5)

Sol.151.(a) Least number which when double is divisible by 15 , 18 , 25 and 32
$= \frac{L.C.M.\ (15, 18, 25, 32)}{2} = \frac{7200}{2}$ = 3600

Sol.152.(b) LCM = 48
Product of numbers = 384
Formula :-
Product of numbers = L.C.M. × H.C.F.
384 = 48 × H.C.F. ⇒ H.C.F. = 8
∴ H.C.F. : L.C.M. = 8 : 48 = 1 : 6

Sol.153.(a) LCM of a and b = 42
Then,
LCM of 5a, 11b = 55ab
= 55 × 42 = 2310

Sol.154.(a) LCM of 3,6,9,12 and 15 = 180 sec = 3 min
So, they will toll 5 times till 8 : 16am.

Sol.155.(c) HCF of 120 , 240 , 150 = 30
30 fruits can be packed in a carton of each fruits,
Then the minimum number of cartons is,
Carton of apples = $\frac{120}{30}$ = 4
Catron of oranges = $\frac{240}{30}$ = 8
carton of pears = $\frac{150}{30}$= 5
Then the minimum number of cartons is-
= 4 + 8 + 5 = 17

Sol.156.(a) P = $2^8 \times 3^5$, Q = $2^3 \times 3^4$,
R = $3^5 \times 2^7$
HCF of P, Q and R = $2^3 \times 3^4$

Sol.157.(a) Let, the two numbers be 15a and 15b Then, 15a + 15b = 75
⇒ a + b = 5 ------ (1)
and, 15 × ab = 90, ⇒ ab = 6
Now, $(a-b)^2 = (a+b)^2 - 4ab$
a - b = $\sqrt{5^2 - 4 \times 6}$
= $\sqrt{25 - 24}$ = 1 ----- (2)
Solving Eqn. (1) and (2), we have :
a = 3 and b = 2
So, the no are 15 × 3 = 45 and 15 × 2 = 30
Hence. the greater number = 45

Sol.158.(b) Let the three numbers be 3x, 8x and 15x
LCM of (3x , 8x , 15x) = 120x
HCF of (3x , 8x , 15x) = x
According to the question
LCM = 120x = 8280 ⇒ x = 69
Now , HCF = x = 69

Sol.159.(a) Let numbers be 81x and 81y.
81[x + y] = 1215 ⇒ x + y = 15
Since numbers lie between 500 and 700, the values of x and y are 8 and 7.
So, the no's are 81×8 and 81 × 7
Now, $\frac{1}{81 \times 8} + \frac{1}{81 \times 7}$
$= \frac{1}{81}[\frac{1}{8} + \frac{1}{7}] = \frac{1}{81}[\frac{7+8}{56}]$
$= \frac{1}{81}[\frac{15}{56}] = \frac{5}{1512}$

Sol.160.(a)
(12 - 8) = (15 - 11) = (20 - 16) = 4
Now, the LCM of (12, 15, 20, 24 and 30) = 120.
When we divide the largest 6-digit i.e. 999999 by 120, it leaves remainder 39
⇒ Required number = (999999 - 39) - 4
= 999956

Sol.161.(d)
Let the two no's be 12x and 12y
ATQ,
12x - 12y = 60 ⇒ x - y = 5
And, 12 × xy = 204 × 12 ⇒ xy = 204
Now, $(x+y) = \sqrt{5^2 + 204 \times 4}$
= $\sqrt{25 + 816}$ = 29
So, the required sum = 12(x + y)
= 12 × 29 = 348

Sol.162.(a) Let the numbers be 13x and 13y. According to question
13x × 13y = 6760 ⇒ 169xy = 6760
⇒ xy = 40
Required number of pairs are (1,40) and (5, 8)

Sol.163.(b) 432 = $2^4 \times 3^3$,
594 = $2 \times 3^3 \times 11$, 702 = $2 \times 3^3 \times 13$,
HCF = 2×3^3 = 54
Cans for first variety of oil = $\frac{432}{54}$ = 8
Cans for 2nd variety of oil = $\frac{594}{54}$ = 11

Cans for 3rd variety of oil = $\frac{702}{54}$ = 13

Sol.164.(a)
$(X^4 - Y^4)$, $(X^8 - Y^8)$ and $(X^2 - Y^2)$
$\Rightarrow X^4 - Y^4 = (X^2 - Y^2)(X^2 + Y^2)$
$= (X + Y)(X - Y)(X^2 + Y^2)$
$\Rightarrow X^8 - Y^8 = (X^4 - Y^4)(X^4 + Y^4)$
$= (X^2 - Y^2)(X^2 + Y^2)(X^4 + Y^4)$
$= (X + Y)(X - Y)(X^2 + Y^2)(X^4 + Y^4)$
$\Rightarrow X^2 - Y^2 = (X + Y)(X - Y)$
Hence, H.C.F = $(X + Y)(X - Y)$

Sol.165.(d) H.C.F of 384, 256 and 480 = 32
Now, $\frac{384}{32} + \frac{256}{32} + \frac{480}{32}$
$= 12 + 8 + 15 = 35$

Sol.166.(d) By difference method
4756 - 2996 = 1756 = 439 × 4
7825 - 4752 = 3073 = 439 × 7
here highest common factor is 439
4 × 3 × 9 = 108

Sol.167.(c)
LCM of (20, 25, 35, 40) = 1400
20 - 15 = 25 - 20 = 35 - 30 = 40 - 35 = 5
Required least number = 1400 - 5 = 1395

Sol.168.(a)
LCM of 18 , 21 , 25 , and 39 = 40950
Remainder = 3
Required number = 40950 + 3 = 40953
Sum of the digits = 4 + 0 + 9 + 5 + 3 = 21

Sol.169.(d)
LCM of 2 ,4,6,8,10 and 12 = 120 sec
10 min = 10 × 60 = 600
They have tolled together = $\frac{600}{120}$ = 5
In starting all bells are tolling together
So, 5 + 1 = 6 times

Sol.170.(d)
Product of two numbers = $LCM \times HCF$
10^{12} × 2nd number = $10^8 \times 10^{12}7^3$
$\Rightarrow$ 2nd number = $\frac{10^8 \times 10^{12}7^3}{10^{12}} = 10^8 \times 7^3$

Sol.171.(a) HCF [(a - b),(b - c)] will be the greatest number that gives the same remainder when we divide a, b and c by the greatest number. So,
Greatest no. = HCF [(226 - 151),(151 - 76)]
HCF = [75 , 75] = 75
Hence, 75 will be the greatest number such that when 76, 151 and 226 are divided by it, The remainder is alike.

Sol.172.(c) 1st Number = 3 × 7 = 21
2nd Number = 4 × 7 = 28
3rd Number = 5 × 7 = 35

Sol.173.(c) LCM of 15, 20, 25, 45 = 900
Greatest number of 4 digit = 9999
When we divide 9999 by 900 we get 99 as remainder.
The required 4 digit number
= 9999 - 99 = 9900

Sol.174.(a) 55 - 3 = 52 , 72 - 7 = 65
123 - 6 = 117
The required number is the
HCF of (52 , 65 , 117) = 13

Sol.175.(b) The least number that which is divisible by 144,108 and 72 is its LCM = 432
So, the least number that when divided by 144,108 and 72 leaves the remainder 3 in each case is $\Rightarrow$ (432 + 3) = 435

Sol.176.(a) We know that
$(a^3 + b^3) = (a + b)(a^2 - ab + b^2)$
$(a + b)^2 = (a + b)(a + b), (a^2 - b^2)$
$= (a + b)(a - b) \Rightarrow$Their HCF is $(a + b)$

Sol.177.(a) Let the numbers be $3x$ and $4x$
LCM($3x$, $4x$) = $12x$
According to the question,
$12x = 144 \Rightarrow x = 12$
So, numbers = 36 and 48
Hence, sum of numbers = 36 + 48 = 84

Sol.178.(b) LCM (8 , 12 , 16) = 48
So, number of tree = 48k + 3
Now, on trying 7 times he had none of the shrubs left
Therefore, k = 3
i.e. 48 × 3 + 3 = 147 is divisible by 7
Hence , required number = 147

Sol.179.(b) LCM (24 , 36 , 48) seconds = 144 seconds
Hence, they meet at one place at 2 min 24 seconds

Sol.180.(d) Number of boys = 442; Number of girls = 374
As the number of boys in the class is same as that of girls.
Strength of one class = HCF of 442 and 374 = 34
$\therefore$ Number of classes of boys = $\frac{442}{34}$ = 13
Number of classes of girls = $\frac{374}{34}$ = 11
$\therefore$ Required number of classes = 13 + 11 = 24.

Sol.181.(c) HCF of 140, 260 and 320 = 20 or volume of each tin = 20 litres.

Sol.182.(b) LCM × HCF = First number × Second number
Let numbers be $3x$ and $2x$
According to the question
$3x \times 2x$ = First number × Second number
$(3x + 2x) = 45 \Rightarrow 5x = 45 \Rightarrow x = 9$
Product of the numbers = $6x^2$
$\Rightarrow 6 \times 9 \times 9 = 486$

Sol.183.(c) $x^4 + x^2y^2 + y^4$
$= (x^2 + xy + y^2)(x^2 - xy + y^2)$
$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$
$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$
LCM of $x^4 + x^2y^2 + y^4, x^3 + y^3, x^3 - y^3$
$= (x^2 + xy + y^2)(x^2 - xy + y^2)$
$(x + y)(x - y)$
$\Rightarrow (x^3 - y^3)(x^3 + y^3) = (x^6 - y^6)$

Sol.184.(a) Let A(x) = x^2 + px + q and B(x) = x^2 + qx + p
Since , (x + k) is HCF (common prime factor) of A(x) & B(x)
A(k) = $k^2 - kp + q = 0$
$k^2 = kp - q$ ....eq .(1)
B(k) = $k^2 - kq + p = 0$
$k^2 = kq - p$ ....eq .(2)
From equation 1 and 2
$kp - q = kq - p$
$k(p - q) = (q - p) \Rightarrow k = -1$

Sol.185.(b)
Time taken by A to cover the 1.2 km
distance = $\frac{1.2}{36} = \frac{1}{30}$ hours
$\Rightarrow$ 120 seconds
Time taken by B to cover the 1.2 km
distance = $\frac{1.2}{54} = \frac{1}{45}$ hours
$\Rightarrow$ 80 seconds
Time taken by C to cover the 1.2 km
distance = $\frac{1.2}{18} = \frac{1}{15}$ hours
$\Rightarrow$ 240 seconds
They will meet at the starting point again = LCM of 120, 80 and 240 seconds
$\Rightarrow$ 240 seconds

Sol.186.(b) The three traffic signals turn from green to red at an interval of 25 seconds, 39 seconds and 60 seconds.
Time after which all the three traffic signals will turn red from green together = LCM of 25 seconds, 39 seconds and 60 seconds = 3900 seconds = 65 minutes = 1 hour 5 minutes
Now, durations for green and red colours are same.
So, the time after which all the three traffic signals will turn green from red together = 1 hour 5 minutes
So, the total time taken by all the three traffic signals to turn green together = 1 hour 5 minutes +1 hour 5 minutes = 2 hours 10 minutes
Thus, the time after which all the three traffic signals will simultaneously change to green again = 2:00 p.m. +2 hours 10 minutes = 4:10 p.m.
Hence, option (b) is correct.