DAILY PRACTICE PROBLEM

Playing with Numbers DPP - 01

Multiple Choice Questions

1. A number for which the sum of all its factors equal to twice the number is called _____.

(1) Perfect number (2) Perfect square (3) Prime number (4) Composite number

2. 39 and 49 are

(1) Both prime numbers (2) Both composite numbers

(3) Both even numbers (4) Both perfect numbers.

3. Which of the following pairs of number are co-prime?

(1) 30, 415 (2) 17, 68 (3) 16, 81 (4) 15, 100

4. How many prime numbers are there up to 100?

(1) 20 (2) 22 (3) 23 (4) 25

5. Perfect numbers are

(1) 5,8 (2) 12,25 (3) 7,14 (4) 6,28

6. Reciprocal of the smallest prime number is _____.

(1) 0 (2) $\frac{1}{2}$ (3) 1 (4) 2

Subjective Questions

7. Is 10 a perfect number?

8. Tell whether each number is prime, composite or neither. 97, 105 and 109.

9. List all the prime numbers less than 25.

10. Write three examples of twin prime.

11. Which of the following pair of numbers are co-prime numbers?

(i) 336 and 443

(ii) 455 and 288

12. Two numbers x and y are relatively prime. What is the common factor of x and y?

13. Are any two prime numbers always co-prime number? Give examples.

14. Can any 3-digit number with 5 at one's place be a prime number? Given reason.

15. Which of the following are not twin- primes? Give reason.

(i) 3,5 (ii) 5,7 (iii) 35,39 (iv) 41,43

SOLUTIONS DPP-01

1. **Option (1)**

A number for which the sum of all its factors equal to twice the number is called perfect number.

2. **Option (2)**

Factors of 39 = 1, 3, 13, 39

Factors of 49 = 1, 7, 49

As both the numbers have more than 2 factors. Therefore, both are composite numbers.

3. **Option (3)**

16, 81

Factors of 16 = 1, 2, 4, 16

Factors of 81 = 1, 3, 9, 27, 81

16, 81 do not have any common factor other than one.

4. **Option (4)**

There are 25 prime numbers up to 100.

5. **Option (4)**

The numbers 6 and 28 are the perfect numbers. Because the sum of their factors is equal to twice the number.

6. **Option (2)**

Smallest prime number =2

Reciprocal =1/2

7. Factors of 10 are 1, 2, 5, 10

Sum of the factors = $1 + 2 + 5 + 10 = 18 \neq 2 \times 10$

As, sum of the factors is not equal to the twice of the number therefore 10 is not a perfect number.

8. Factors of 97 = 1 and 97.

As, 97 has exactly 2 unique factors i.e. 1 and the number itself therefore it is a prime number.

Factors of 105 = 1, 3, 5, 7, 15, 21, 35, 105.

As, 105 has more than 2 factors therefore it is a composite number.

Factors of 109 = 1 and 109

As 109 has exactly 2 unique factors i.e. 1 and the number itself therefore it is a prime number.

9. Prime numbers less than 25 are 2, 3, 5, 7, 11, 13, 17, 19, 23.

10. Twin prime numbers are two prime numbers that differ by 2.

Example:- (3,5), (5,7), (11,13)

11. (i) Factors of 336 = 1, 2, 3, 4, 6, 8, 7, 12, 14, 16, 21 etc. and factors of 443 = 1 and 443.

As both the numbers have only 1 as common factor therefore, they are co-prime numbers.

(ii) We know that $455 = 5 \times 7 \times 13$ and $288 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$. As both the numbers have only 1 common factor i.e. 1, therefore they are co-prime numbers.

12. Two numbers are said to be relatively prime if they have only 1 as a common factor. Therefore, if x and y are relatively prime numbers then their common factor will be 1.

13. Co-prime numbers are those numbers that have 1 as their common factor. Prime numbers are those numbers that have two unique factors i.e. 1 and the number itself. Therefore, a common factor between two prime numbers will always be 1. So yes, we can say that any two prime numbers are always co-prime numbers.

Example: - (7, 17) , (19, 23), (41, 43) etc.

14. Let 3-digit numbers with 5 at ones place be 105, 115, 125, 205, 295 etc.

Now, $\frac{105}{5}=21, \frac{115}{5}=23, \frac{125}{5}=25$

So, we can conclude that all the above numbers are divisible by 5 hence making 5 as a factor of all the numbers.

Therefore, any three-digit number with 5 at ones place can never be a prime number.

15. (i) 3, 5

Given numbers 3 and 5 are prime numbers.

And, 5 – 3 = 2.

Therefore yes, they are twin primes.

(ii) 5, 7

Given numbers 5 and 7 are prime numbers.

And 7 – 5 = 2.

Therefore, yes both are twin primes.

(iii) 35, 39

Given numbers 35 and 39 are not prime numbers.

Also, $39 - 35 = 4 \neq 2$.

Therefore, they are not twin primes.

(iv) 41, 43

Both the numbers are prime numbers.

And 43 – 41 = 2.

Therefore yes, they are twin primes.

DAILY PRACTICE PROBLEM

Playing with Numbers DPP-02

Multiple Choice Questions

1. The number which is not a multiple of 8 is

(1) 64 (2) 4 (3) 16 (4) 80

2. The number which is not a factor of 18 is

(1) 5 (2) 3 (3) 2 (4) 6

3. The number which is a factor of every number is

(1) 0 (2) 1 (3) 2 (4) both 1 & 0

4. All the factors of 25 are

(1) 1, 5, 25 (2) 1, 5, 15 (3) 1, 5, 20 (4) 1, 2, 4

5. Every number is a multiple of…….

(1) 0 (2) 1 (3) –1 (4) None of these

6. The correct option is

(1) factors are infinite. (2) multiples are finite.

(3) 1 is a factor of every number. (4) every number is not a multiple of itself.

7. The number of multiples of 50 are

(1) limit less (2) 200 (3) 150 (4) 100

8. Which of the following numbers is not a factor of 36?

(1) 2 (2) 4 (3) 18 (4) 8

9. Which of the following numbers is not a factor of 24?

(1) 2 (2) 3 (3) 4 (4) 5

10. Which of the following numbers is not a multiple of 6?

(1) 12 (2) 21 (3) 24 (4) 36

Subjective Questions

11. List all the factors of 18, 120 and 162.

12. (A) Write first 6 multiples of 11 and 15.

(B) Write first five multiples of 9.

13. Find the possible factors of 45, 30.

14. Find all multiples of 25 up to 100.

15. Write first 3 multiples of greatest 4-digit number.

SOLUTIONS DPP-02

1. Option (2)

Except 4, all the other given numbers are completely divisible by 8 and hence 4 is not a multiple of 8.

2. Option (1)

We know that 18 = 2 × 9 = 3 × 6, Therefore, 5 is not a factor of 18.

3. Option (2)

Every number is divisible by 1. So, 1 is the factor of every number.

4. Option (1)

25 gets divided exactly by 1, 5 and 25. Thus, the factors of 25 are 1, 5 and 25.

5. Option (2)

Since 1 × 1 = 1, 1 × 2 = 2, 1 × 3 = 3, 1 × 4 = 4

So, 1 is factor of every number or every number is a multiple of one.

6. Option (3)

Take factors of any number say

Factors of 7 = 1, 7

Factors of 9 = 1, 3, 9

So, it is true that 1 is a factor of every number.

7. Option (1)

Multiples of any number are infinite.

Example: Multiples of 50 are 50, 100, 150, 200, ……..

i.e., list is endless, so multiples of a given number are infinite.

8. Option (4)

$$8\overline{)\,36\,)4}$$
$$\underline{-32}$$
$$4$$

Remainder is not zero hence 8 is not a factor of 36.

9. Option (4)

$$5\overline{)\,24\,)4}$$
$$\underline{-20}$$
$$4$$

Remainder is not zero hence 5 is not a factor of 24.

10. Option (2)

Multiple of 6 are 6,12, 18, 24, 30, 36 and so on. Here, 21 not comes.

11. The number 18 can be written as :

$1 \times 18, 2 \times 9$ and 3×6

$\therefore$ Factors of 18 are 1, 2, 3, 6, 9, 18

The number 120 can be written as: -

$1 \times 120, 2 \times 60, 3 \times 40, 4 \times 30, 5 \times 24, 6 \times 20, 8 \times 15, 10 \times 12$

$\therefore$ Factors of 120 are 1, 2, 3, 4, 5, 6, 8, 10 ,12, 15, 20, 24, 30 ,40, 60, 120.

The number 162 can be written as:-

$1 \times 162, 2 \times 81, 3 \times 54, 6 \times 27, 9 \times 18$

$\therefore$ Factors of 162 are 1, 2, 3, 6, 9, 18 ,27, 54, 81, 162.

12. **(A)** First 6 multiples of 11 will be:-

$11 \times 1 = 11$

$11 \times 2 = 22$

$11 \times 3 = 33$

$11 \times 4 = 44$

$11 \times 5 = 55$

$11 \times 6 = 66$

And, first 6 multiples of 15 will be: -

$15 \times 1 = 15$

$15 \times 2 = 30$

$15 \times 3 = 45$

$15 \times 4 = 60$

$15 \times 5 = 75$

$15 \times 6 = 90$

(B) The first five multiples of 9 will be:-

$9 \times 1 = 9$

$9 \times 2 = 18$

$9 \times 3 = 27$

$9 \times 4 = 36$

$9 \times 5 = 45$

13. The number 45 can be written as :-

$1 \times 45, 3 \times 15, 5 \times 9$

$\therefore$ Factors of 45 are 1, 3, 5, 9, 15 ,45.

The number 30 can be written as :-

$1 \times 30, 2 \times 15, 3 \times 10, 5 \times 6$

$\therefore$ Factors of 30 are 1, 2, 3, 5, 6, 10, 15, 30.

14. Multiples of 25 up to 100 are :

$25 \times 1 = 25$

$25 \times 2 = 50$

$25 \times 3 = 75$

$25 \times 4 = 100$

15. We know that greatest 4-digit number is 9999. Its 3 multiples are :

$9999 \times 1 = 9999$

$9999 \times 2 = 19998$

$9999 \times 3 = 29997$

DAILY PRACTICE PROBLEM

Playing with Numbers DPP-03

Multiple Choice Questions

1. The number which is divisible by 5 is

(1) 3527 (2) 3614 (3) 4399 (4) 37595

2. The number 438750 is divisible by

(1) 2, 4 (2) 8 (3) 5,10 (4) 2, 5, 10

3. What least value should be given to * so that the number 8456*4107 is divisible by 3?

(1) 0 (2) 1 (3) 2 (4) 5

4. Number 10824 is

(1) divisible by 11 (2) divisible by 3, 11

(3) divisible by 2, 3, 4, 6, 9, 11 (4) divisible by 2, 3, 4, 6, 11

5. Which of the following number is divisible by 9?

(1) 2952 (2) 2953 (3) 2954 (4) 2950

6. Which of the following number is divisible by 6?

(1) 12930 (2) 12935 (3) 12933 (4) 12932

7. Which of the following number is divisible by 4?

(1) 12930 (2) 12935 (3) 12933 (4) 12932

8. What least value should be given to * so that the number 653*47 is divisible by 11?

(1) 9 (2) 6 (3) 2 (4) 1

9. The number divisible by 11 is

(1) 1116365 (2) 1802701 (3) 8790322 (4) 901351

10. Which of the following number is divisible by 4?

(1) 2513784 (2)1820741 (3) 7012345 (4) 6854321

11. Which of the following number is not divisible by 5?

(1) 3416800 (2) 4151615 (3) 2110505 (4) 5000501

12. **Fill in the blanks with the smallest digit making**

(i) 146_8 divisible by 3 (ii) 5703_2 divisible by 4

(iii) 725_26 divisible by 11

Subjective Questions

13. Using divisibility test determine which of the following numbers are divisible by 4 and 8.

(i) 6000 (ii) 726352 (iii) 21084 (iv) 12159

14. (A) Write digit in the blank space of each of the following numbers so that each number is divisible by 11.

(i) 92_389 (ii) 8_9484

(B) Using divisibility test, determine if the following numbers are divisible by 11 or not.

(i) 376948 (ii) 4789321

15. What will come in place of * so that the given numbers are divisible by 9.

(i) 241*279 (ii) 594*84

16. A number is divisible by 12. By what other numbers will that number be divisible?

17. Determine 22155 is divisible by 45 or not.

18. A number is divisible by both 5 and 12. By which other number will that number be always divisible?

19. Using divisibility tests, determine which of the following numbers are divisible by 10.

(i) 567895 (ii) 540980

20. Write the smallest digit in the blank space so that the number formed is divisible by 3:

(i)32 _386 (ii) 5 _ 945

SOLUTIONS DPP-03

1. Option (4)

A number which has either 0 or 5 in its one's place is divisible by 5.

Since, the number 37595 has 5 in its one's place thus it is divisible by 5.

2. Option (4)

Given no: 438750

DIVISIBILITY BY

2 – yes, since units place is even

4 – No, since number formed by last 2 digits is 50, not divisible by 4

5 – Yes, since units place is 0.

8 – No, since number formed by last three digits i.e., 750 is not divisible by 8.

10 – Yes, since units place is 0.

3. Option (2)

8456*4107

Sum of the digit = 8 + 4 + 5 + 6 + * + 4 + 1 + 0 + 7 = 35 + *

So, * = 1

As 35 + 1 = 36, 36 is divisible by 3

So, least value of * = 1

4. Option (4)

10824

Number is even, so it is divisible by 2.

Sum of digits = 1 + 0 + 8 + 2 + 4 = 15

As 15 is divisible by 3 so 10824 is also divisible by 3.

Number formed by least two digits = 24

24 is divisible by 4 so 10824 is also divisible by 4.

Number 10824 is divisible by 2 and 3 both, So it is divisible by 6 also.

$\Rightarrow$ Sum of digits = 15, 15 is not divisible by 9, So 10824 is not divisible by 9.

Sum of digits at even place = 0 + 2 = 2

Sum of digits at odd place = 1 + 8 + 4 = 13

Difference = 13 – 2 = 11

So, 10824 is also divisible by 11.

5. Option (1)

Sum of digits = 2 + 9 + 5 + 2 = 18

As 18 is divisible by 9, So 2952 is also divisible by 9.

6. **Option (1)**

Number is even, so 12930 is divisible by 2.

Sum of digits = 1 + 2 + 9 + 3 + 0 = 15

As 15 is divisible by 3, So, 12930 is also divisible by 3.

Number 12930 is divisible by both 2 and 3 (Co-prime numbers). So, it is divisible by 6 also.

7. **Option (4)**

Since 12932 is divisible by 4 because number formed by last two digits 32 is divisible by 4, so it is divisible by 4.

8. **Option (4)**

If we put 1 in place of * then that number will be divisible by 11.

Difference = (6 + 3 + 4) – (5 + * + 7)

0 or 11 = 13 – 12 – *

0 = 1 – *

$\therefore$ * = 1.

9. **Option (4)**

In the case of given number 901351, we find that the difference of sum of digits at even place and sum of digits at odd place is divisible by 11, so the number 901,351 is divisible by 11.

Another method: Subtract the last digit from the remaining leading truncated number. If the result is divisible by 11, then so is the first given number. Now on applying the method to 901351; 90135 – 1 = 90134. Then we apply the same to 90134; 9013 – 4 = 9009. Further on applying the same to 9009; 900 – 9 = 891. Finally, we apply the same method to 891; 89 – 1 = 88. We get 88, which is divisible by 11 and so the number. 901,351 is divisible by 11.

10. **Option (1)**

2513784

If the last two term of a given no is divisible by 4, then whole no is also divisible by 4.

84 ÷ 4 = 21

11. **Option (4)**

The last digit should be 0 or 5 for a number divisible by 5.

50,00,501 is not divisible by 5.

12. (i) 146_8

= 146x8

Sum of the digits = 1 + 4 + 6 + x + 8 = 19 + x

To make 19 + x a multiple of 3, smallest value of x = 2.

$\Rightarrow$ 19 + 2 = 21 = multiple of 3

$\therefore$ x = 2, number = 14628

(ii) 5703__2

= 5703x2

The last 2 digits are x2.

To make x 2 divisible by 4, x = 1, 3, 5, 7, 9

Smallest digit is 1 making x2 = 12.

$\therefore$ x = 1, number = 570312.

(iii) 725__26

= 725x26

Sum of the digits at odd places = 7 + 5 + 2 = 14

Sum of digits at even places = 2 + x + 6 = 8 + x

Difference = 14 – (8 + x) = 14 – 8 – x = 6 – x

To make difference equal to 0, x = 6.

$\therefore$ x = 6, number = 725626

13. (i) 6000

The last two digits are 00 and 00 is divisible by 4. Therefore 6000 is divisible by 4.

The last three digits are 000 and 000 is divisible by 8. Therefore 6000 is divisible by 8.

(ii) 726352

The last two digits are 52 and 52 is divisible by 4, $(\text{as } 52 \div 4 = 13)$. Therefore 726352 is divisible by 4.

The last three digits are 352 and 352 is divisible by 8, $(\text{as } 352 \div 8 = 44)$. Therefore 726352 is divisible by 8.

(iii) 21084

The last two digits are 84 and 84 is divisible by 4, $(\text{as } 84 \div 4 = 21)$. Therefore 21084 is divisible by 4.

The last three digits are 084 and 084 is not divisible by 8. Therefore 21084 is not divisible by 8.

(iv) 12159

The last two digits are 59 and 59 is not divisible by 4. Therefore 12159 is not divisible by 4.

The last three digits are 159 and 159 is not divisible by 8. Therefore 12159 is not divisible by 8.

14. **(A)**

(i) 92__389

Let the digit in the blank space be x.

Now, sum of digits at odd places = 9 + x + 8 = 17 + x

Sum of digits at even places = 2 + 3 + 9 = 14

And, difference = 17 + x – 14 = 3 + x

So, to make (3 + x), a multiple of 11, x = 8

Such that 3 + 8 = 11

$\therefore$ x = 8, number = 928389.

(ii) 8_9484

Let the digit in the blank space be x.

Now, sum of digits at odd places = 8 + 9 + 8 = 25

Sum of digits at even places = x + 4 + 4 = 8 + x

And, difference = 25 – (8 + x) = 25 – 8 – x = 17 – x

So, to make 17 – x a multiple of 11, x = 6.

Such that 17 – 6 = 11

$\therefore$ x = 6 , number = 869484

(B)

(i) 376948

Sum of the digits at odd places = 3 + 6 + 4 = 13

Sum of the digits at even places = 7 + 9 + 8 = 24

Difference = 24 – 13 = 11 = multiple of 11.

Therefore, yes 376948 is divisible by 11.

(ii) 4789321

Sum of the digits at odd places = 4 + 8 + 3 + 1 = 16

Sum of the digits at even places = 7 + 9 + 2 = 18

Difference = 18 – 16 = 2 $\neq$ 0 or multiple of 11.

Therefore, no 4789321 is not divisible by 11.

15. **(i)** 241*279

= 241x279

Sum of its digits = 2 + 4 + 1 + x + 2 + 7 + 9 = 25 + x

To make (25 + x), a multiple of 9, x = 2.

Such that 25 + 2 = 27 = multiple of 9.

$\therefore$ x = 2, number = 2412279.

(ii) 594*84

= 594x84

Sum of its digits = 5 + 9 + 4 + x + 8 + 4 = 30 + x

To make (30 + x), a multiple of 9, x = 6

= 30 + 6 = 36

$\therefore$ x = 6, number = 594684

16. If a number is divisible by 12, then it is divisible by each of the factors of 12.

$\therefore$ Factors of 12 = 1, 2, 3, 4, 6.

Hence, the number will also be divisible by 1, 2, 3, 4, 6, 12.

17. If a number is divisible by 45, then it is divisible by each of the factors of 45.

$\therefore$ factors of 45 = 1, 3, 5, 9, 15, 45.

So, checking the divisibility of 22155 by 3, 5, 9.

(i) Sum of the digits = 2 + 2 + 1 + 5 + 5 = 15 = 3 × 5

Therefore, yes 22155 is divisible by 3.

(ii) The last digit is 5. Therefore 22155 is also divisible by 5.

(iii) Sum of the digits = 15. As 15 is not a multiple of 9 therefore it is not divisible by 9.

Hence 22155 is not divisible by 45.

18. The numbers 5 and 12 are co-prime numbers. Therefore, If a number is divisible by 5 and 12 then it is divisible by their product also = 5 × 12 = 60.

$\therefore$ The number will always be divisible by 60.

19. (i) 567895

The last digit is 5 and not 0.

Therefore 567895 is not divisible by 10.

(ii) 540980

The last digit is 0.

Therefore, 540980 is divisible by 10.

20. (i) 32__386

= 32x386

Sum of its digits = 3 + 2 + x + 3 + 8 + 6 = 22 + x

So, to make (22 + x), a multiple of 3, x = 2.

Such that 22 + x = 22 + 2 = 24 = 3 × 8

$\therefore$ x = 2, number = 322386.

(ii) 5__945

= 5x945

Sum of its digits = 5 + x + 9 + 4 + 5 = 23 + x

So, to make (23 + x), a multiple of 3, x = 1

Such that 23 + x = 23 + 1 = 24 = 3 × 8.

$\therefore$ x = 1, number = 51945.

DAILY PRACTICE PROBLEM

Playing with numbers DPP-04

Multiple Choice Questions

1. The prime factorisation of 24 is

(1) 2 × 3 × 4 (2) 2 × 2 × 2 × 3 (3) 6 × 4 (4) 8 × 3

2. The prime factorisation of 140 is

(1) 2 × 2 × 7 (2) 2 × 2 × 5 (3) 2 × 2 × 5 × 7 (4) 2 × 2 × 5 × 7 × 3

3. The prime factorisation of 96 is

(1) 2 × 2 × 2 × 3 (2) 2 × 2 × 2 × 2 × 2 × 3

(3) 6 × 16 (4) 8 × 12

4. The prime factorisation of 1323 is

(1) $3^3 \times 3^3$ (2) $3^3 \times 7^3$ (3) $3^3 \times 7^2$ (4) $3^2 \times 7^3$

5. The prime factorisation of 100 is

(1) 2 × 3 × 5 (2) 2 × 2 × 5 (3) 2 × 2 × 5 × 5 (4) 2 × 5 × 2

6. The prime factorisation of smallest four digit number is

(1) 2 × 2 × 2 × 5 × 5 × 5 (2) 2 × 2 × 2 × 5 × 5

(3) 2 × 2 × 2 × 2 × 5 × 5 (4) 2 × 2 × 2 ×2 × 5 × 5 × 5 × 5

7. The prime factors of 135 are

(1) 3, 3, 15 (2) 3, 5, 9 (3) 3, 3, 3, 5 (4) none of these

8. Which of the following is the correct prime factorisation of the greatest 4-digit number?

(1) 2 × 2 × 11 × 101 (2) 2 × 3 × 5 × 11 (3) 2 × 3 × 11 × 11 (4) 3 × 3 × 11 × 101

9. The sum of all the prime factors of 63 is

(1) 4 (2) 8 (3) 10 (4) 14

10. Considering the prime factorization, the prime factors of 450 are

(1) 2 × 3 × 3 × 5 × 5 (2) 2 × 5 × 7 (3) 2 × 3 × 5 × 5 (4) 2 ×2 × 5

11. The prime factors of 680 are

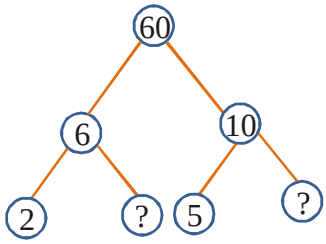
(1) 2 × 3 × 3 × 5 ×5 (2) 2 ×3 × 7 (3) 2 × 2 × 2 × 5× 17 (4) 2 ×3 × 5 × 8

Subjective Questions

12. Express 144 as a product of prime factors and draw a factor tree.

13. Write the smallest 5-digit number and express it into the form of prime factors.

14. Write the missing numbers in the given factor tree.



15. In which of the following expressions prime factorisation has been done.

(i) $24 = 2 \times 3 \times 4$ (ii) $56 = 1 \times 7 \times 2 \times 2 \times 2$

(iii) $70 = 2 \times 5 \times 7$ (iv) $54 = 2 \times 3 \times 9$

SOLUTIONS DPP-04

1. Option (2)

The prime factorisation is 2 × 2 × 2 × 3.

2	24
2	12
2	6
3	3
	1

2. Option (3)

The prime factorisation of 140 is

2	140
2	70
5	35
7	7
	1

So, prime factorisation is 2 × 2 × 5 × 7

3. Option (2)

The prime factorisation of 96 is

2	96
2	48
2	24
2	12
2	6
3	3
	1

So, prime factorisation is 2 × 2 × 2 × 2 × 2 × 3

4. Option (3)

The prime factorisation of 1323 is

3	1323
3	441
3	147
7	49
7	7
	1

So, prime factorisation is $3 \times 3 \times 3 \times 7 \times 7 = 3^3 \times 7^2$

5. Option (3)

The prime factorisation of 100 is:

2	105
2	50
5	25
5	5
	1

$\therefore$ 100 = 2 × 2 × 2 × 5

6. Option (1)

Smallest four-digit number is 1000.

Prime factorisation of 1000 = 2 × 2 × 2 × 5 × 5 × 5

7. Option (3)

3	135
3	45
3	15
5	5
	1

135 = 3 × 3 × 3 × 5

8. Option (4)

9999 is the greatest 4-digit number.

3 × 3 × 11 × 101 is the prime factorisation of 9999.

9. Option (3)

3	63
3	21
7	7
	1

63 = 3 × 3 × 7

So, Prime factor are 3, 7

Sum of prime factors = 3 + 7 = 10

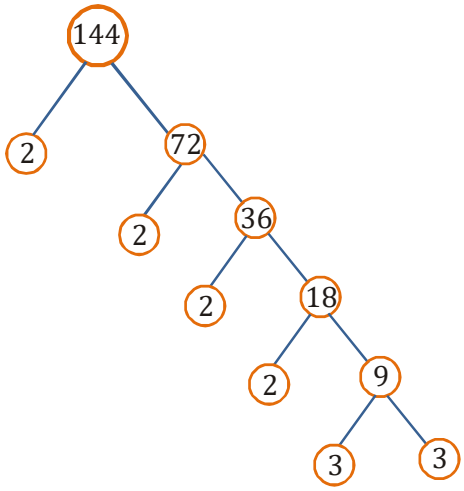
10. Option (1)

Prime factor of 450= 2 × 3 × 3× 5 × 5

11. Option (3)

Prime factor of 680= 2 × 2 × 2 × 5× 17

12. The factor tree of 144 is :-



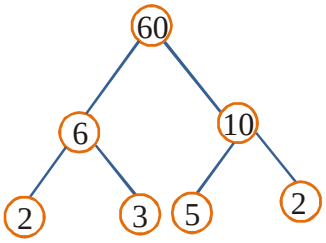
$\therefore$ 144 = 2 × 2 × 2 × 2 × 3 × 3

13. We know that the smallest 5-digit number is 10000.
The prime factorisation of 10000 is: -

2	10000
2	5000
2	2500
2	1250
5	625
5	125
5	25
5	5
	1

$\therefore$ 10000 = 2 × 2 × 2 × 2 × 5 × 5 × 5 × 5

14. The factor tree of 60 is :-



15. (i) 24 = 2 × 3 × 4
The number 4 is not a prime number. Therefore 24 is not expressed in prime factorisation.
(ii) 56 = 1 × 7 × 2 × 2 × 2
The numbers 2 and 7 are prime numbers but not 1. Therefore 56 is not expressed in prime factorisation form.
(iii) 70 = 2 × 5 × 7
The numbers 2, 5 and 7 are prime numbers. Therefore 70 is expressed in prime factorisation form.
(iv) 54 =2 × 3 × 9
The number 9 is not a prime number. Therefore, 54 is not expressed in prime factorisation form.

DAILY PRACTICE PROBLEM

Playing with numbers DPP-05

Multiple choice questions

1. The common factors of 20 and 24

(1) 1, 2, 12 (2) 1, 4, 6 (3) 1, 4, 8 (4) 1, 2, 4

2. All the common factors of 25 and 75

(1) 5 (2) 25 (3) 5, 25 (4) 1,5,25

3. The common factors of 35 and 34

(1) 1, 5 (2) 1, 7 (3) 1 (4) 1, 2, 5, 7, 17, 34, 35

4. The common factors of 6, 8 and 12

(1) 1, 2 (2) 1, 2, 3 (3) 1, 2, 4 (4) 1, 2, 6

5. First three common multiples of 4 and 6 are

(1) 1, 2 and 3 (2) 2, 4 and 6. (3) 12, 24 and 36 (4) 12, 30 and 46

6. The first three common multiples of 8 and 12 are

(1) 24, 48, 12 (2) 16, 48, 72 (3) 36, 48, 72 (4) 24, 48, 72

7. The common factor of 9 and 15 is

(1) 3 (2) 6 (3) 9 (4) 15

Subjective Questions

8. Find first three common multiples of

(i) 3 and 6 (ii) 12 and 18 (iii) 10 and 15

9. Find the common factors of

(i) 8, 20

(ii) 9, 15

10. Find all the common factors of

(i) 12, 15, 18 (ii) 10, 28, 35

SOLUTIONS DPP-05

1. Option (4)

The factors of 20 = 1,2, 4, 5, 10, 20

The factors of 24 = 1, 2, 3, 4, 6, 8, 12, 24

Therefore, common factors of 20 and 24 = the numbers which occur in both the lists =1, 2, 4.

2. Option (4)

The factors of 25 = 1,5, 25

The factors of 75 = 1, 3, 5, 15, 25,75

Therefore, common factors of 25 and 75 = the numbers which occur in both the lists =1, 5, 25.

3. Option (3)

The factors of 35 = 1,5, 7, 35

The factors of 34 = 1, 2, 17, 34

Therefore, common factors of 35 and 34 = the numbers which occur in both the lists =1.

4. Option (1)

The factors of 6 = 1,2, 3, 6

The factors of 8 = 1, 2, 4, 8

The factors of 12 = 1, 2, 3, 4, 6, 12

Therefore, common factors of 6, 8 and 12 = 1, 2

5. Option (3)

The multiples of 4 = 4, 8, 12, 16, 20, 24, 28, 32, 36, ...

The multiples of 6 = 6, 12, 18, 24, 30, 36, ...

Therefore, first three common multiples of 4 and 6 = the numbers which occur in both the lists = 12, 24 and 36.

6. Option (4)

Multiples of 8 are 8, 16, 24, 32, 40, 48, 56, 64, 72, ...

Multiples of 12 are 12, 24, 36, 48, 60, 72, ...

Therefore, the first three common multiples of 8 and 12 are 24, 48, and 72.

7. Option (1)

Since 9 and 15 are divided by 3

$$3\overline{)9}\,(3 \quad\quad 3\overline{)15}\,(5$$
$$\underline{-9} \quad\quad\quad \underline{-15}$$
$$0 \quad\quad\quad 0$$

$9 = 3 \times 3$

$15 = 3 \times 5$

8. (i) Multiples of 3 = 3, 6, 9, 12, 15, 18, 21, 24 .....

Multiples of 6 = 6,12,18,24,30,36,42,48 .....

∴ First 3 common multiples of 3, 6 = 6, 12 and 18 .

(ii) Multiples of 12 = 12, 24, 36, 48, 60, 72, 84, 96, 108 .....

Multiples of 18 = 18, 36, 54, 72, 90, 108 .....

∴ First three common multiples of 12, 18 = 36, 72, 108.....

(iii) Multiples of 10 = 10, 20, 30, 40, 50, 60, 70, 80, 90 .....

Multiples of 15 = 15, 30, 45, 60, 75, 90 .....

∴ First Three common multiples of 10 & 15 = 30, 60, 90 ....

9. (i) Factors of 8 = 1, 2, 4, 8

Factors of 20 = 1, 2, 4, 5, 10, 20

∴ Common factors of 8 & 20 = 1, 2, 4

(ii) Factors of 9 = 1, 3, 9

Factors of 15 = 1, 3, 5, 15

∴ Common factors of 9 & 15 = 1, 3

10. (i) Factors of 12 = 1, 2, 3, 4, 6, 12

Factors of 15 = 1, 3, 5, 15

Factors of 18 = 1, 2, 3, 6, 9, 18

∴ Common factors of 12, 15 &18 = 1, 3

(ii) Factors of 10 = 1, 2, 5, 10

Factors of 28 = 1, 2, 4, 7, 14, 28

Factors of 35 = 1, 5, 7, 35

∴ Common factors of 10, 28, 35 =1

DAILY PRACTICE PROBLEM

Playing with numbers DPP-06

Multiple choice questions

1. LCM of 36 and 72 is

(1) 36 (2) 72 (3) 108 (4) 2

2. Find the L.C.M of 112, 160 and 188

(1) 188 (2) 4 (3) 52640 (4) 105280

3. Find the LCM of 18, 24 and 32 is

(1) 2 (2) 132 (3)254 (4) 288

4. Find the least number, which is divisible by 20, 40, 75.

(1) 600 (2) 800 (3) 1500 (4) 300

5. Greatest and smallest 3-digit number which are exactly divisible by 3,5,15 is

(1) 45, 945 (2) 75, 980 (3) 105, 990 (4) 120, 975

6. The greatest 4-digit number which is divisible by 4, 6, 12 is

(1) 9998 (2) 9997 (3) 9996 (4) 9995

7. The smallest 4 digits number exactly divisible by 8, 10, 12 is

(1) 1000 (2) 1040 (3) 1080 (4) 1200

8. Find the smallest number which when divided by 36 and 63 leaves 3 as the remainder?

(1) 365 (2) 435 (3) 255 (4) 445

9. HCF of 36 and 144 is

(1) 36 (2) 144 (3) 4 (4) 2

10. The HCF of 9 and 27 is

(1) 27 (2) 9 (3) 3 (4) 2

11. The HCF of 35, 42 and 77 is

(1) 7 (2)6 (3) 5 (4) 2

12. Find the HCF of 48, 64

(1) 8 (2) 16 (3) 48 (4) 64

13. Find the HCF of 96, 128

(1) 96 (2) 128 (3) 32 (4) 8

14. For any two numbers, which of the following is correct?

(1) HCF × LCM = their sum (2) HCF × LCM = their difference

(3) HCF × LCM = their product (4) All the above

15. LCM of two numbers =……?

(1) Product of numbers ÷ their HCF (2) Product of numbers × their HCF

(3) product of numbers (4) None of these

16. H.C.F of two numbers =…..?

(1) Product of the numbers and their L.C.M

(2) Product of the numbers ÷ L.C.M

(3) Both

(4) None

17. Product of two numbers is 2160 and their H.C.F is 12. The L.C.M of these numbers is

(1) 1030 (2) 720 (3) 320 (4) 180

18. The LCM and HCF of the numbers 30 and 45 are in the ratio

(1) 2 : 3 (2) 6 : 1 (3) 7 : 2 (4) 7 : 5

19. HCF of 21, 39 and 87 is

(1) 2 (2) 3 (3) 7 (4) 1

Subjective Questions:

20. (i) Find the LCM of 144 and 180 by listing method.

(ii) Find the LCM of 16, 24 using prime factorisation method.

21. Determine the smallest 3-digit number which is exactly divisible by 6, 8 and 12.

22. Find two numbers whose LCM is 4 and their sum is 5.

23. Find the smallest number which when divided by 10, 50, 15 leaves the remainder of 5 in each case.

24. Find the LCM of 25 and 155 by common division method.

25. Find the H.C.F of (i) 24 and 36 (ii) 15, 25 and 30

26. Find the H.C.F of 98 and 112 using prime factorisation method.

27. Find the H.C.F of 255 and 357 by continued division method.

28. Find the H.C.F of 2261, 3059 and 3325.

29. For each of the following pairs of numbers, verify that L.C.M × HCF = product of the numbers

(i) 21, 28

(ii) 104, 195

(iii) 30, 65

(iv) 36, 90

30. Find the HCF & LCM of 231 and 273. Also, find the product of the HCF and LCM of the numbers check, how the above product is related to the product 231 × 273

SOLUTIONS DPP-06

1. Option (2)

72 is the least common multiple of 36 and 72.

2	36, 72
2	18, 36
2	9, 18
3	9, 9
3	3, 3
	1, 1

LCM = 2 × 2 × 2 × 3 × 3 = 72

2. Option (3)

L.C.M of 112, 160 and 188 is given by

2	112,	160,	188
2	56,	80,	94
2	28,	40,	47
2	14,	20,	47
2	7,	10,	47
5	7,	5,	47
7	7,	1,	47
47	1,	1,	47
	1,	1	1

L.C.M. = 2 × 2 × 2 × 2 × 2 × 5 × 7 × 47 = 52640

3. Option (4)

Prime factorisation of 18 = 2 × 3 × 3

Prime factorisation of 24 = 2 × 2 × 2 × 3

Prime factorisation of 32 = 2 × 2 × 2 × 2 × 2

L.C.M. of 18, 24 and 32 = 2 × 2 × 2 × 2 × 2 × 3 × 3 = 288

4. Option (1)

The least number, which is divisible by 20, 40, 75 is the L.C.M of 20, 40, and 75.

2	20,	40,	75
2	10,	20,	75
2	5,	10,	75
3	5,	5,	75
5	5,	5,	25
5	1,	1,	5
	1,	1,	1

L.C.M. = 2 × 2 × 2 × 3 × 5 × 5 = 600

5. **Option (3)**

L.C.M. of 3, 5, 15 is 15.

So, smallest number divisible by 3, 5, 15 is 15.

But we require smallest 3-digit number.

So, it will be 15 × 7 = 105

Next, Greatest 3-digit number will be 15 × 66 = 990.

6. **Option (3)**

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

L.C.M. of 4, 6, 12 = 12

$$\begin{array}{r|l} 12 & 9999 \\ \hline & -96 \\ & \hline & 39 \\ & -36 \\ & \hline & 39 \\ & -36 \\ & \hline & 3 \text{ (Remainder)} \end{array} \quad 833$$

The remainder on dividing 9999 by 12 = 3

Now, the greatest 4-digit number which is divisible by 4, 6, 12 = 9999 – 3 = 9996

7. **Option (3)**

L.C.M of 8, 10, 12

2	8,	10,	12
2	4,	5,	6
2	2,	5,	3
3	1,	5,	3
5	1,	5,	1
	1,	1,	1

2 × 2 × 2 × 5 × 3 = 120

$$\begin{array}{r|l} 120 & 1000 \\ \hline & -960 \\ & \hline & 40 \end{array} \quad 8$$

1000 + (120 – 40) = 1080

8. **Option (3)**

The smallest number divided by 36 and 63 is of LCM.

2	36,	63
2	18,	63
3	9,	63
3	3,	21
7	1,	7
	1,	1

2 × 2 × 3 × 3 × 7 = 252

It gives remainder 3 when divided by 36, 63.

Therefore when 255 is divided by 36 & 63 it gives remainder 3.

9. **Option (1)**

Since $36 = 2 \times 2 \times 3 \times 3$

and $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$

HCF $= 2 \times 2 \times 3 \times 3 = 36$ (Common in both)

Thus, the highest common factor between 36 and 144 is 36.

10. **Option (2)**

Since $9 = 3 \times 3$

and $27 = 3 \times 3 \times 3$

HCF $= 3 \times 3 = 9$ (Common in both)

Thus, the highest common factors between 9 and 27 is 9.

11. **Option (1)**

Prime factors of $35 = 5 \times 7$

$42 = 2 \times 3 \times 7$

$77 = 11 \times 7$

The highest common factor of these numbers is 7.

12. **Option (2)**

Prime factorisation of 48:

2	48
2	24
2	12
2	6
3	3
	1

Prime factorisation of 64:

2	64
2	32
2	16
2	8
2	4
2	2
	1

$48 = \boxed{2} \times \boxed{2} \times \boxed{2} \times \boxed{2} \times 3$

$64 = \boxed{2} \times \boxed{2} \times \boxed{2} \times \boxed{2} \times 2 \times 2$

Highest Common Factor $= 2 \times 2 \times 2 \times 2 = 16$

13. Option (3)

H.C.F. (96, 128) by continued division method.

$$96\overline{)128}\,(1$$
$$-96$$
$$32\overline{)96}\,(3$$
$$-96$$
$$0$$

H.C.F. = 32

14. Option (3)

HCF × LCM = their product

15. Option (1)

Product of numbers =LCM × HCF

Thus, L.C.M = $\frac{\text{Product of two numbers}}{\text{HCF}}$

16. Option (2)

Since, Product of two numbers=L.C.M × H.C.F

Thus, H.C.F = $\frac{\text{Product of two numbers}}{\text{LCM}}$

17. Option (4)

Product of numbers = H.C.F. × L.C.M.

a × b = H.C.F × L.C.M

Where a & b are any two natural numbers

Given is a × b = 2160

H.C.F = 12

Therefore 2160 = 12 × L.C.M Or

L.C.M = 2160 ÷ 12 = 180

18. Option (2)

Factors of 30 = 2 × 3 × 5

Factors of 45 = 3 × 3 × 5

LCM of 30 and 45 = 2 × 3 × 3 × 5 = 90 and

HCF of 30 and 45 = 3 × 5 = 15

Required ratio of LCM and HCF = 90 : 15 = 6 : 1

19. Option (2)

$21 - (3) \times 7$
$39 - (3) \times 13$
$87 - (3) \times 29$

HCF – 3

20. **(i)** Multiples of 144 = 144, 288, 432, 576, 720 ....

Multiples of 180 = 180, 360, 540, 720 ....

$\therefore$ least common multiple of 144 & 180 is 720.

(ii) LCM of 16, 24 :

2	16
2	8
2	4
2	2
	1

2	24
2	12
2	6
3	3
	1

$\Rightarrow$ $16 = 2 \times 2 \times 2 \times 2$

$24 = 2 \times 2 \times 2 \times 3$

Common factor = $2 \times 2 \times 2$; other factors = 2×3

$\therefore$ LCM = $\underbrace{2 \times 2 \times 2}_{\text{Common Factor}} \times \underbrace{2 \times 3}_{\text{Other Factor}} = 48$

21. Given numbers = 6, 8 and 12

LCM of 6, 8, 12

2	6,8,12
2	3,4,6
2	3,2,3
3	3,1,3
	1,1,1

LCM = $2 \times 2 \times 2 \times 3 = 24$

So, 24 is exactly divisible by 6, 8 and 12. Therefore multiples of 24 will also be divisible by 6, 8 and 12. They are 24, 48, 72, 96, 120....

Hence, the required number is 120.

22. Let the two numbers be x and y.

Given $(x + y) = 5$

So, possible values of (x, y) = (1, 4) (2, 3)

And L.C.M of x and y = 4

Now, LCM of (1, 4) = 4

And LCM of (2, 3) = 6

Required number are 1, 4.

23. LCM of 10, 50, 15:

2	10,50,15
3	5,25,15
5	5,25,5
5	1,5,1
	1,1,1

LCM = 2 × 3 × 5 ×5 = 150

Required number = 150 + 5 = 155

24. LCM of 25, 155:

5	25,155
5	5,31
31	1,31
	1,1

∴ LCM = 5 × 5 × 31

= 25 × 31

= 775

25. (i) Factors of 24 = 1, 2, 3, 4, 6, 8, 12, 24

Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36

Now, common factors = 1, 2, 3, 4, 6,12

∴ highest common factor (HCF) of 24 and 36 is 12.

(ii) Factors of 15 = 1, 3, 5, 15

Factors of 25 = 1, 5, 25

Factors of 30 = 1, 2, 3, 5, 6, 10, 15, 30

Now, common factors = 1, 5

∴ highest common factor (HCF) of 15, 25, 30, is 5

26. Prime factorisation of 98 and 112 are :-

2	98
7	49
7	7
	1

2	112
2	56
2	28
2	14
7	7
	1

98 = 2 × 7 × 7

112 = 2 × 2 × 2 × 2 × 7

∴ HCF of 98 & 112 = 2 × 7 = 14

27. HCF of 255 & 357 by continued division method

$$\begin{array}{r} 1 \\ 255\overline{)\,357} \\ -255 \\ \hline 102\overline{)\,255} \\ -204 \\ \hline 51\overline{)\,102} \\ -102 \\ \hline 0 \end{array}$$

$\therefore$ HCF of 255 and 357 = 51

28. Prime factorisation of 2261, 3059, 3325 are

7	2261
17	323
19	19
	1

7	3059
19	437
23	23
	1

5	3325
5	665
7	133
19	19
	1

$2261 = \underline{7} \times 17 \times \underline{19}$

$3059 = \underline{7} \times \underline{19} \times 23$

$3325 = 5 \times 5 \times \underline{7} \times \underline{19}$

$\therefore$ HCF of (2261, 3059, 3325) = $7 \times 19 = 133$

29. **(i)** 21, 28

LCM of 21 and 28:

2	21, 28
2	21, 14
3	21, 7
7	7, 7
	1, 1

$= 2 \times 2 \times 3 \times 7$

$= 84$

HCF of 21 and 28

3	21
7	7
	1

2	28
2	14
7	7
	1

HCF = 7

Now, LCM × HCF = Product of numbers

Now, L.H.S. = L.C.M × H.C.F.

$= 84 \times 7 = 588$

and R.H.S = Product of the numbers

$= 21 \times 28 = 588$

As, L.H.S = R.H.S.

Hence verified

(ii) 104, 195

L.C.M of 104 & 195 :

2	104, 195
2	52, 195
2	26,195
3	13, 195
5	13, 65
13	13, 13
	1,1

= 2 × 2 × 2 × 3 × 5 × 13 = 1560

HCF of 104 & 195 =?

2	104
2	52
2	26
13	13
	1

3	195
5	65
13	13
	1

HCF of 104 & 195 = 13

Now, LCM × HCF = Product of numbers

L.H.S = LCM × HCF

= 1560 × 13 = 20280

R.H.S = Product

= 104 × 195 = 20280.

As, L.H.S = R.H.S

Hence verified.

(iii) 30 & 65

LCM of 30 & 65 :-

2	30,65
3	15,65
5	5,65
13	1,13
	1,1

LCM = 2 × 3 × 5 × 13

LCM = 390

HCF of 30 & 65 :

2	30
3	15
5	5
	1

5	65
13	13
	1

HCF = 5

Now, LCM × HCF = Product of numbers

L.H.S = LCM × HCF

= 390 × 5 = 1950

R.H.S = Product

= 30 × 65 = 1950

As, L.H.S = R.H.S

Hence verified.

(iv) 36 & 90

LCM of 36 & 90

2	36,90
2	18,45
3	9,45
3	3,15
5	1,5
	1,1

LCM of 36 & 90 = 2 × 2 × 3 × 3 × 5

LCM = 180

HCF of 36 & 90

2	36
2	18
3	9
3	3
	1

2	90
3	45
3	15
5	5
	1

HCF = 2 × 3 × 3 = 18

LCM × HCF = Product of numbers

Now, L.H.S = LCM × HCF

= 180 × 18 = 3240

R.H.S = Product

= 36 × 90 = 3240

As, L.H.S = R.H.S

Hence verified.

30. LCM of 231 & 273

3	231,273
7	77,91
11	11,13
13	1,13
	1,1

LCM = 3 × 7 × 11 × 13

LCM = 3003

HCF of 231, 273

3	231
7	77
11	11
	1

3	273
7	91
13	13
	1

HCF = 3 × 7

HCF = 21

Now, LCM × HCF = 3003 × 21 = 63063

And Product = 231 × 273 = 63063

We can say that, LCM × HCF is equal to the product of the numbers.