

# **Playing with Numbers**

## **MATHEMATICAL REASONING**

- A number is divisible by both 5 and 12. By which other number will that number be always divisible?
   (a) 72
   (b) 60
  - (c) 62 (d) 42
- What least value should be given to \* so that the number 653\*47 is divisible by 11?
  (a) 9
  (b) 6
  (c) 7
  (d) 1
- **3.** The number (11, 13) are \_\_\_\_\_numbers. (a) Co-prime
  - (b) Prime
  - (c) Both prime and co-prime
  - (d) None of these
- **4.** The smallest number which when divided by 20, 25, 35 and 40 leaves a remainder of 14, 19, 29 and 34 respectively, is .
  - (a) 1394 (b) 1404
  - (c) 1664 (d) 1406
- 5. The HCF of two consecutive odd numbers is (a) 2 (b) 0 (c) 4 (d) 1
- 6. The HCF of two numbers is 28 and their LCM is 336. If one number is 112, then the other number is \_\_\_.
  (a) 64 (b) 84

| (c) 34 | (d) 92 |
|--------|--------|
| (0) 34 | (u) 92 |

- **7.** A number which has more than two factors is called a
  - (a) Composite number
  - (b) Even number
  - (c) Odd number
  - (d) Prime number

- **8.** Observe the following patterns. Then find the sum of 1+3+5+7+9+...+19.
  - $=1 \times 1 = 1$ 1 1 + 3 $= 2 \times 2 = 4$ 1 + 3 + 5 $= 3 \times 3 = 9$ 1 + 3 + 5 + 7 $= 4 \times 4 = 16$ 1+3+5+7+9 $=5 \times 5 = 25$ ..... ..... (a) 121 (b) 81 (d) 64 (c) 100
- **9.** The HCF of the denominator and the numerator of a fraction which is in its lowest form is
  - (a) 1
  - (b) 0
  - (c) Always an even number
  - (d) Can't be determined
- 10. The two numbers nearest to 10000 which are exactly divisible by each of 2, 3, 4, 5, 6 and 7, are \_\_\_.
  (a) 9660, 10080 (b) 9320, 10080 (c) 9660, 10060 (d) 10340, 10080
- 11. The co-prime numbers from the following pairs, are \_\_\_\_.
  (a) 7 and 63
  (b) 36 and 25
  (c) 25 and 81
  - (c) 35 and 21 (d) 63 and 81
- 12. Which of the following numbers has exactly 4 factors?(a) 16(b) 14
  - (c) 18 (d) None of these
- **13.** HCF of the two numbers =
  - (a) Product of numbers + their LCM
  - (b) Product of numbers their LCM
  - (c) Product of numbers x their LCM
  - (d) Product of numbers their LCM

- 14. A number is always divisible by 90, if .
  - (a) It is divisible by both 2 and 45
  - (b) It is divisible by both 5 and 18
  - (c) It is divisible by both 9 and 10
  - (d) All of these
- 15. The reciprocal of the smallest prime number
  - is . (a) 0

  - (b)  $\frac{1}{2}$
  - (c) 1
  - (d) 2
- **16**. The two numbers which have only 1 as their common factor are called .
  - (a) Co-primes
  - (b) Twin primes
  - (c) Composite
  - (d) Even numbers
- 17. If 5476 a is divisible by 3, then what can be the least value of a?

| (a) 1 | (b) 2 |
|-------|-------|
| (c) 3 | (d) 6 |

18. The least number which when decreased by 9 is exactly divisible by 12, 16, 24 and 48 is

| (a) 16 | (b) 48 |
|--------|--------|
| (c) 57 | (d) 39 |

19. Find the greatest number which will divide the greatest 3-digit number and the greatest 4-digit number exactly.

| (a) 9 | (b) 8 |
|-------|-------|
| (c) 7 | (d) 3 |

- 20. The HCF and LCM of two numbers is 36 and 720 respectively. If one of the numbers is 180, the other number is . (a) 144
  - (b) 120
  - (c) 80
  - (d) 64

# **EVERYDAY MATHEMATICS**

- 21. There are 153 apples and 119 oranges. These fruits are to be arranged in heaps containing the same number of fruits. Then the greatest number of fruits possible in each heap is .
  - (a) 15 (b) 23 (d) 20 (c) 17
- 22. The least number of square tiles that will be needed to pave a plot 225 m by 30 m is (a) 30 tiles
  - (b) 15 tiles
  - (c) 25 tiles
  - (d) 45 tiles
- 23. Three boys steps off together from the same spot. Their steps measure 63 cm, 70 cm and 77 cm, respectively. What is the minimum distance each should cover so that all can cover distanced complete steps?
  - (a) 6930cm
  - (b) 6000cm
  - (c) 7000cm
  - (d) 6520cm
- Two tankers contain 850 litres and 680 litres 24. of kerosene oil respectively, then the maximum capacity of a container which can measure the kerosene out of both the tankers when used an exact number of times is . (a) 170 litres
  - (b) 85 litres
  - (c) 34 litres
  - (d) 10 litres
- 25. The length, breadth and height of a room are 403 cm, 434 cm and 465 cm respectively. Find the longest tape which can measure the three dimensions of the room exactly.
  - (a) 31 cm
  - (b) 30 cm
  - (c) 25cm
  - (d) 35cm

### **ACHIEVERS SECTION (HOTS)**

**26.** State T for true and 'F' for false.

(i) If an even number is divided by 2, the quotient is always odd.

(ii) All even numbers are composite numbers.(iii) The LCM of two co-prime numbers cannot be equal to their product.

(iv) Every number is a factor of itself.

|     | (i) | (ii) | (iii) | (iv) |
|-----|-----|------|-------|------|
| (a) | Т   | Т    | F     | F    |
| (b) | F   | F    | F     | Т    |
| (c) | Т   | F    | Т     | Т    |
| (d) | F   | F    | Т     | Т    |

**27.** Read the following statements. Statement - 1: A number for which sum of all its factors is equal to twice the number is called perfect number.

> Statement-2: If two numbers are divisible by a number, then their sum and difference are also divisible by that number.

Which of the following options holds?

(a) Both Statement-1 and Statement-2 are true.

(b) Statement-1 is true but Statement-2 is false.

(c) Statement-1 is false but Statement-2 is true.

(d) Both Statement-1 and Statement-2 are false.

**28.** Fill in the blanks.

(i) The HCF of two co-prime numbers is <u>P</u>.
(ii) Two natural numbers which have no common factor except 1 are called <u>Q</u> numbers.

(iii) If a number is divisible by 9 then sum of its digits must be divisible by  $\underline{R}$ .

|     | Р | Q        | R |
|-----|---|----------|---|
| (a) | 1 | prime    | 3 |
| (b) | 1 | co-prime | 9 |
| (c) | 0 | prime    | 9 |
| (d) | 0 | co-prime | 3 |

- **29.** Find the value of a + b + c, if 373a is divisible by 9, 473b is divisible by 11 and 371 c is divisible by 6. (a) 7 (b) 6
  - (c) 0 (d) 9
- **30.** Match the following.

| Column I | Column II         |
|----------|-------------------|
| (i) 49   | (p) Multiple of 3 |
| (ii) 25  | (q) Multiple of 4 |
| (iii) 16 | (r) Multiple of 7 |
| (iv) 39  | (s) Multiple of 5 |

|     | (i) | (ii) | (iii) | (iv) |
|-----|-----|------|-------|------|
| (a) | S   | р    | r     | q    |
| (b) | r   | S    | q     | р    |
| (c) | S   | r    | р     | q    |
| (d) | р   | q    | r     | S    |

| ANSWER KEY  |   |     |   |             |   |     |   |     |   |
|-------------|---|-----|---|-------------|---|-----|---|-----|---|
| 1.          | В | 2.  | D | 3.          | С | 4.  | А | 5.  | D |
| 6.          | В | 7.  | А | <b>8</b> .  | С | 9.  | А | 10. | А |
| 11.         | В | 12. | В | 13.         | D | 14. | D | 15. | В |
| 16.         | А | 17. | В | 18.         | С | 19. | А | 20. | А |
| 21.         | С | 22. | А | 23.         | А | 24. | А | 25. | А |
| <b>26</b> . | В | 27. | A | <b>28</b> . | В | 29. | D | 30. | В |

# HINTS & EXPLANATIONS

- 1. (b) : A number is divisible by both 5 and 12. This number is also divisible by  $5 \times 12 = 60$ .
- 2. (d) : Sum of odd places = 6 + 3 + 4 = 13Sum of even places = 5 + \* + 7 = 12 + \*If the number is divisible by 11, then either 13 - (12 + \*) = 0Or 13 - (12 + \*) = 11 m, where m is any integer.  $\Rightarrow * = 1$
- (c) : HCF of 11 and 13 is 1.
   ∴ (11, 13) are co-prime numbers.
   Also, 11 and 13 are prime numbers.

- 4. (a): The smallest number which is exactly divisible by 20, 25, 35 and 40 is their LCM.  $\therefore$  LCM = 2×2×2×5×5×7 = 14002 20, 25, 35, 40 2 10, 25, 35, 20 2 5, 25, 35, 10 5 5, 25, 35, 5 5 1, 5, 7, 1
  - 7 1, 1, 7, 1 1, 1, 1, 1 ... Required number will be 6 less than LCM = 1400 - 6= 1394

#### **5**. (d)

6. (b) : We have, one number =112Let other number be x. HCF = 28, LCM = 336Now, product of two numbers = HCF  $\times$  LCM  $\Rightarrow 112 \times x = 28 \times 336 \Rightarrow x = \frac{28 \times 336}{28 \times 336}$ 112  $\Rightarrow x = 84$ .

- 7. (a)
- 8.  $(c): 1 + 3 + 5 + 7 + 9 + \dots + 19$  $=10 \times 10 = 100$
- 9. (a)
- 10. (a) : The numbers which are exactly divisible by 2, 3, 4, 5, 6 and 7 are the multiples of the LCM of the given numbers.  $\therefore$  LCM=2×2×3×5×7=420 Now, dividing 10000 by 420, we get remainder = 340∴ Number just less than 10000 and exactly divisible by the given numbers = 10000 - 340 = 9660 Number just greater than 10000 and exactly divisible by the given numbers = 10000 + (420 - 340) = 10080
- 11. (b) : (a) HCF (7, 63) = 7

- (b) HCF (36, 25) = 1(c) HCF (35, 21) = 7(d) HCF (63, 81) = 9So, 36 and 25 are co-prime numbers.
- 12. (b) : (a) Factors of 16 are 1, 2, 4, 8, 16 (b) Factors of 14 are 1, 2, 7, 14 (c) Factors of 18 are 1, 2, 3, 6, 9, 18
- 13. (d) :We know that, Product of numbers =  $HCF \times LCM$  $\Rightarrow$  HCF = Product of numbers  $\div$  LCM
- 14. (d)
- 15. (b) : The smallest prime number is 2.

$$\therefore$$
 Required reciprocal =  $\frac{1}{2}$ 

- 16. (a)
- 17. (b) : If 5476a is divisible by 3, then 5 + 4 + 47 + 6 + a = 22 + a is divisible by 3. ∴ a = 2
- 18. (c) :The least number which is exactly divisible by 12, 16, 24 and 48 is their LCM. 9 19 16 94 49

$$\begin{array}{r}
2 & 12, 10, 24, 48 \\
\hline 2 & 6, 8, 12, 24 \\
\hline 2 & 3, 4, 6, 12 \\
\hline 2 & 3, 2, 3, 6 \\
\hline 3 & 3, 1, 3, 3 \\
\hline 1, 1, 1, 1 \\
\therefore LCM = 2 \times 2 \times 2 \times 2 \times 3 \\
= 48 \\
Now, the required number is \\
LCM = 48 + 9 = 57
\end{array}$$

19. (a) : The greatest 3-digit number = 999The greatest 4-digit number = 9999The greatest number which will divide both 999 and 9999 exactly is their HCF.

9 more than the

- **20.** (a) :We have, one number =180 Let other number be x. Now, product of numbers =HCF × LCM  $\Rightarrow 180 \times x = 36 \times 720$  $\Rightarrow x = \frac{36 \times 720}{180} = 144$
- **21.** (c) :The greatest number of fruits in each heap is the HCF of 153 and 119.

 $\begin{array}{r} 119 \overline{153} \\ -119 \\ 34 \overline{)119} \\ 34 \overline{)119} \\ -102 \\ 17 \overline{)34} \\ 2 \\ -34 \\ 0 \end{array}$ 

 $\therefore$  HCF (153, 119) =17 Hence, greatest number of fruits possible in each heap is 17.

**22.** (a) : Largest length of side of square tile is the HCF of 225 and 30.  $\therefore$  HCF = 15 Number of tiles required  $= \frac{\text{Area of plot}}{\text{Area of 1 tile}} = \frac{225 \times 30}{15 \times 15} = 30$ 

**23.** (a) : The minimum distance all boys should cover is the LCM of 63 cm, 70 cm and 77 cm.

| 2     | 63, 70, 77                                     |
|-------|--|
| 3     | 63, 35, 77                                     |
| 3     | 21, 35, 77                                     |
| 5     | 7, 35, 77                                      |
| 7     | 7, 7, 77                                       |
| 11    | 1, 1, 11                                       |
|       | 1, 1, 1  |
| : LCN | $A=2\times3\times3\times5\times7\times11=6930$ |

So, 6930 cm is the minimum distance each should cover so that all can cover distance in complete steps.

(a) : Capacity of two tankers are 850 L and 680 L.
 680 850 7

Maximum capacity of container is the HCF of 850 and 680.

∴ HCF=170

So, maximum capacity of container = 170 L

**25.** (a) : Dimensions of room are 403 cm, 434 cm and 465 cm.

The longest tape which can measure the all dimensions of the room exactly is the HCF of 403, 434 and 465.

$$403\overline{)434}1$$

$$-403$$

$$-403$$

$$-31$$

$$\overline{)31}403\overline{)13}$$

$$-31$$

$$-155$$

$$\overline{)93}$$

$$-93$$

$$0$$

$$\cdot \text{HCF} = 31$$

So, length of longest tape = 31 cm

- 26. (b) : (i) If an even number is divided by 2, the quotient is not always odd.
  (ii) 2 is an even prime number.
  (iii) The LCM of two co-prime numbers is always equal to their product.
  (iv) Every number is a factor of itself.
  - **27.** (a)
  - **28.** (b)
- **29.** (d) : 373 a is divisible by 9.  $\Rightarrow 3+7+3+a=13+a \text{ should be divisible}$ by 9.  $\Rightarrow a=5$ 473b is divisible by 11.  $\Rightarrow 4+3-7-b=0 \text{ or } 11 \Rightarrow b=0 \text{ or } 11$   $\therefore b=0$

371 c is divisible by 6. ⇒ 371c is divisible by both 2 and 3. ⇒ c is an even number and 3 + 7 + 1 + c is divisible by 3. ⇒ c = 0, 2, 4, 6, 8 and 11 + c is divisible by 3. ⇒ c = 4∴ a + b + c = 5 + 0 + 4 = 9

- **30.** (b) : (i) 49 is multiple of 7.
  - (ii) 25 is multiple of 5.
  - (iii) 16 is multiple of 4.
  - (iv) 39 is multiple of 3.