

Row Labels	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Grand Total
HCF & LCM	1	4	2	1	2	5	15
Sum of Numbers	1	3	4	1	2	4	15
Remainder Theorem	1	1	1	2		1	6
Divisibility Rules	1		2			2	5
Unit Digit	1	1		1		1	4
Grand Total	5	9	9	5	4	13	45

1. A rectangular courtyard is 2 meters 16 cm long and 3 meters 60 cm broad. It is to be paved with square tiles of the same size. Find the maximum side length of the square tile.

A) 12 cm B) 72 cm C) 48 cm D) 86 cm E) 60 cm

2. The HCF and LCM of two numbers are 15 and 90 respectively. If the sum of the two numbers is 75, find the two numbers.

A) 15, 60 B) 30, 45 C) 15, 75 D) 25, 50 E) 20, 55

3. Find the least number which when divided by 18, 24, 30, and 42 leaves a remainder of 7 in each case.

A) 2527 B) 2520 C) 2513 D) 1267 E) 1260

4. What is the remainder when 143^{46} is divided by 10? A) 1 B) 9 C) 7 D) 3 E) 5

5. Find the number of positive integer values of k such that $4k + 3$ is divisible by k.

A) 4 B) 3 C) 2 D) 5 E) 1

6. If x^3 is odd, which of the following statements is true if $x > 1$?

1. $x^2 + x$ is odd

2. $x^2 + x$ is even

3. $x^2 + x$ is divisible by 4

A) 1 only B) 2 only C) 1 and 2 only D) 2 and 3 only E)

None of these

7. Find the number of even factors of 720.

A) 30 B) 24 C) 15 D) 12 E) 20

8. Which of the following is not true about 9240?

A) divisible by 9 B) divisible by 8 C) divisible by 3 D) divisible by 11 E) divisible by 5

9. Find the last digit when 3^{83} is added to 7^{82} ?

A) 1 B) 3 C) 6 D) 7 E) 9

Solutions

1. B) Length = 2 m 16 cm = 216 cm; Breadth = 3 m 60 cm = 360 cm

Prime factors: $216 = 2^3 \times 3^3$; $360 = 2^3 \times 3^2 \times 5$

Max tile size = HCF (216, 360) = $2^3 \times 3^2 = 8 \times 9 = 72$ cm

2. B) 30, 45: Product = HCF \times LCM = 1350; numbers satisfying sum 75 \rightarrow 30 and 45.

3. A) 2527: Required number = LCM(18,24,30,42)+7 = 2520+7 = 2527.

4. B) 9: Last digit cycle of 3 $\rightarrow 3^4$ gives 1 cycle; 46 mod 4 = 2 \rightarrow last digit = 9.

5. C) 2: $4k + 3$ divisible by $k \rightarrow 3$ divisible by $k \rightarrow k = 1, 3 \rightarrow$ total 2 values.

6. D) 2 and 3 only: x odd $\Rightarrow x^2$ odd; $x^2+x = \text{odd}+\text{odd} = \text{even}$ and divisible by 4.

7. B) 24: $720 = 2^4 \times 3^2 \times 5 \rightarrow$ even factors = total minus odd = $30-6 = 24$.

8. A) divisible by 9: Digit sum = 15, not divisible by 9 \rightarrow statement false.

9. C) 6: Cyclicity
3 cycle (3,9,7,1), $83 \bmod 4 = 3 \rightarrow$ last digit = 7;
7 cycle (7,9,3,1), $82 \bmod 4 = 2 \rightarrow$ last digit = 9 \rightarrow sum = $7 + 9 = 16 \rightarrow$ last digit = 6.

