



Number Theory – Free Sample Quiz Explanatory Answers

1. The sum of 'n' consecutive integers is '0'. Which of the following statements is / are true?
- I. There will be more odd integers than even integers in the above set of integers.
 - II. The value of 'n' will be odd
 - III. The first and the last integer of the set of integers will be even.

Explanatory answers

If the sum of 'n' consecutive integers is '0', then the set of integers will have equal number of positive and negative integers and will also include '0' which is neither positive nor negative.

For instance, -2, -1, 0, 1, 2.

It has two negative integers, two positive integers and '0'.

Therefore, the value of 'n' will always be odd. Hence, statement II is true.

In the above example, we have more even integers than odd integers. It could be the other way too, depending on the first term. If the first term is odd, then there will be more odd integers. If the first term is even, then there will be more even integers. Hence, statement I is not true.

It is also evident that the third statement is false.

Hence, answer is (II only)

2. Which of the following numbers will always divide a 5-digit number of the form $xy0xy$, where 'x' can take values from 1 to 9 and 'y' can take values from 0 to 9?
- I. 143
 - II. 77
 - III. 93

Explanatory answers

A number of the form $xy0xy$ can be written as $xy \cdot 1000 + xy$
 $= xy(1000 + 1) = 1001 \cdot xy$

1001 can be factorized as $7 \cdot 11 \cdot 13$.

Hence, the number $xy0xy$ can be written as $7 \cdot 11 \cdot 13 \cdot (xy)$

This number will always be divisible by $11 \cdot 13 = 143$ and by $11 \cdot 7 = 77$.

Therefore, the correct answer is (I and II)

3. What is the remainder of the division of $14414 \cdot 14416 \cdot 14418$ by 14?

Explanatory answers

If three product of three numbers $p \cdot q \cdot r$ is divided by a divisor, 'd', then the remainder obtained will be the product of the remainders of the division of 'p' by 'd', 'q' by 'd' and 'r' by 'd'.

In this case, we need to find the remainder of the division of $14414 \cdot 14416 \cdot 14418$ by 14.

The remainder when 14414 is divided by 14 is 8

The remainder when 14416 is divided by 14 is 10 and

The remainder when 14418 is divided by 14 is 12.

Hence, the required remainder is $8 \cdot 10 \cdot 12 = 960$.

The remainder of any division HAS TO BE LESS THAN the divisor.

In this case 960 is > 14 .

Hence, find the remainder when 960 is divided by 14. The remainder is 8.

Therefore, the remainder of the division of $14414 \cdot 14416 \cdot 14418$ by 14 is 8.