Short Answer Type Questions – I

[2 marks]

Que 1. Can the number 4", n being a natural number, end with the digit 0? Give reason.

Sol. If 4^n ends with 0, then it must have 5 as a factor. But, $(4)^n = (2^2)^n$ i.e., the only prime factor of 4^n is 2. Also, we know from the fundamental theorem of arithmetic that the prime factorization of each number is unique.

$\therefore$ 4^n can never end with 0.

Que 2. Write whether the square of any positive integer can be of the form 3m + 2, where m is a natural number. Justify your answer.

Sol. No, because any positive integer can be written as 3q, 3q + 1, 3q + 2, therefore, square will $9q^2 = 3m$, $9q^2 + 6q + 1 = 3(3q^2 + 2q) + 1 = 3m + 1$,

$9q^2 + 12q + 4 = 3(3q^2 + 4q + 1) + 1 = 3m + 1$.

Que 3. Can two numbers have 18 as their HCF and 380 as their LCM? Give reason.

Sol. No, because here HCF (18) does not divide LCM (380).

Que 4. Write a rational number between $\sqrt{3}$ and $\sqrt{5}$.

Sol. A rational number between $\sqrt{3}$ and $\sqrt{5}$ is $\sqrt{324} = 1.8 = \frac{18}{10} = \frac{9}{5}$

Que 5. The product of two consecutive integers is divisible by 2. Is this statement true or false? Give reason.

Sol. True, because n (n + l) will always be even, as one out of the n or (n+ l) must be even.

Que 6. Explain why 3 x 5 x 7 + 7 is a composite number.

Sol. $3 \times 5 \times 7 + 7 = 7(3 \times 5 + 1) = 7 \times 16$, which has more than two factors.

Que 7. What is the least number that is divisible by all the numbers from 1 to 10?

Sol. Required number = LCM of 1, 2, 3,… 10 = 2520

Que 8. Find the sum $0.\overline{68} + 0.\overline{73}$.

Sol. $0.\overline{68} + 0.\overline{73} = \frac{68}{99} + \frac{73}{99} = \frac{141}{99} = 1.\overline{42}$

Que 9. "the product of three consecutive positive integers is divisible by 6". Is this statement true or false? Justify your answer.

Sol. True, because n(n + 1)(n + 2) will always be divisible by 6, as at least one of the factors will be divisible by 2 and at least one of the factors will be divisible by 3.