CHAPTER NINE

SET

The number system:

Our number system can be divided into the following groups of set:

1. The set of integers, i.e {… -3,-2,-1,0,1,2,3,4 ...}
   Integers are positive and negative whole numbers.
2. The set of whole numbers ie {0,1,2,3,4 ……}
   Whole numbers are numbers from zero upwards.
3. The set of natural or counting numbers i.e
   {1,2,3,4 …}
   These are numbers from 1 upwards
4. The set of odd numbers ie. {1,3,5,7,9……..}
   These are numbers which when divide by 2, always give us a remainder, but 1is an odd number.
5. The set of prime numbers ie {2,3,5,7,11,13,17,…}
   Prime numbers are numbers which have only two factors, for example 7 = 1x7 i.e has only two factors which are 1 and 7.
   Also 3 = 1x3 ie has only two factors ie 1and 3.
   But 9 is not a prime number since it has four factors which are 3 and 3, as well as 1 and 9. i.e 9 = 1x9 and 9 = 3x3.
6. The set of composite numbers ie {4,6,8,9,10 …..}
   These are numbers which have more than two factors. For example the factors of 4 are 1 and 4, as well as 2 and 2 i.e 4 = 1x4 and 4 = 2 x 2.
7. The set of even numbers i.e {2,4,6,8,10,12….}
   These are numbers which can be divided by 2 without any a remainder.

Factors of a given number:

These are whole numbers which can divide that given number without any remainder, with the given number being the highest factor. Examples are

1. The factors of 6 = 1,2,3,6
2. The factors of 8 = 1,2,4,8

3. The factors of 30 = 1, 2, 3,5, 6,15, 30.

Multiple of a given number:

If y is our number, then the multiples of y = 1xy, 2xy, 3xy,4xy ……
= y, 2y,3y,4y,…….

For example: The multiples of 2 = 1x2, 2x2, 3x2, 4x2 = 2,4,6,8 …….
Also the multiples of 5 = 1x5, 2x5, 3x5, 4x5 …. = 5, 10, 15, 20……

Q1. Find the set of natural numbers from 1 to 12.

Soln.

The set of natural numbers from 1 to 12 = {1,2,3,4,5,6,7,8,9,10,11,12} or {1,2,3,…….12}.

Q2.Find the set of the even natural numbers from 1 to 12

Soln.

We first find the set of natural numbers from 1 to 12 ie.

{1,2,3,4,5,6,7,8,9,10,11,1

We then select the even numbers among them. $Therefore$ { natural even numbers from 1 to 12} = {2, 4, 6, 8, 10, and 12}.

Q3. Determine the set of the multiples of 3, which are less than 15.

Soln.

The multiples of 3 less than 15 = {3, 6, 9, 12}.

Q4. Find the set of the odd multiples of 3 up to 18.

Soln.

The multiples of 3 up to 18 = {3, 6, 9, 12, 15, 18}.

Selecting the odd ones among them =>{Odd multiples of 3 up to 18} = {3, 9, 15}.

Q5. Find the set of the prime factors of 6.

Soln.

{Factors of 6} = {1, 2, 3, 6}.

Selecting only the prime numbers among them

=>{Prime factors of 6} = {2, 3}.

Q6. Find the set of the even whole numbers from 10 to 15.

Soln.

{whole numbers from 10 to 15}= {10, 11, 12, 13, 14, 15}

Selecting the even numbers among them => {even whole numbers from 10 to 15} = {10, 12, 14}.

Q7. Find the set of the odd whole numbers from 5 to 10

Soln.

{whole numbers from 5 to 10} = {5, 6, 7, 8, 9, 10}.

Selecting the odd ones among them =>{odd whole numbers from 5 to 10} = {5, 7, 9}.

Q8. Find the set of all the composite numbers from 3 to 12.

Soln.

{Composite numbers from 3 to 12}= {4, 6, 8, 9, 10, 12}.

Q9. Find the set of the odd prime numbers from 1 to 6

Soln.

{Prime numbers from 1 to 6}= {2, 3, 5}.

Selecting the odd numbers among them $=>$ odd prime numbers from 1 to 6} = {3, 5}.

Q10. Find the set of composite odd numbers from 5 to 12.

Soln.

{Odd numbers from 5 to 12} = {5, 7, 9, 11}.

Selecting the composite ones among them => the{composite odd numbers from 5 to 12} = {9}.