Ex-10-(D)

1. State whether the given set is infinite or finite:

(i) $\{3,5,7,.....\}$ (ii) $\{1,2,3,4\}$
(iii) $\{....,-3,-2,-1,0,1,2\}$ (iv) $\{20,30,40,50....200\}$

Solution:

i- Set $\{3,5,7,.....\}$ is infinite.
ii- Set $\{1,2,3,4\}$ is finite.
iii- Set $\{.....-3,-2,-1,0,1,2\}$ is infinite.
iv- Set $\{20,30,40,50.....200\}$ is finite.

2. Which of the following sets is empty?

(i) Set of counting numbers between 5 and 6.
(ii) Set of odd numbers between 7 and 19.
(iii) Set of odd numbers between 7 and 9.
(iv) Set of even numbers which are not divisible by 2.

Solution:

i- We know that, there is no counting number between 5 and 6.
Hence, the given set is empty.

ii- There are elements in the set of odd numbers between 7 and 9
Hence, the given set is empty.

iii- We know that, there is no odd numbers between 7 and 9.
Hence the given set is empty.

iv- We know that there is no even number that is not divisible by 2.
Hence the given set is empty.

v- We find one element in the given set.
Hence, the given set is not empty.

2- State whether true or false:

(i) Sets {4,9,6,2} and {6,2,4,9} are not the same.

3. State which pair of sets given below are equal sets and which are equivalent.

(i) {3,5,7} and {5,3,7}
(ii) {8,6,10,12} and {3,2,4,6}
(iii) {7,7,2,1,2} and {1,2,7}
(iv) {2,4,6,8,10} and {a,b,d,e,m}

Solution:

(i)- Given sets
{3,5,7} and {5,3,7}
The elements are same in both sets.
Hence, the given pair of sets is equal.

ii- Given sets
{8, 6, 10, 12} and {3, 2, 4, 6}
The elements of both the sets are different but the number of elements is same

Hence the given pair of sets is equivalent

iii- Given sets
{7, 7, 2, 1, 2} and {1, 2, 7}

The elements are same in both the sets.

Hence, the given pair of sets is equal.

iv- Given sets

{2, 4, 6, 8, 10} and {a, b, d, e, m}.

The elements of both the sets are different but number of elements is same.

4. State which of the following are finite and which are infinite.

(i) Set of integers (ii) {Multiple of 5}
(iii) {fraction between 1 and 2}
(iv) {Number of people in India}
(v) Set of trees in the world.
(vi) Set of leaves on a tree.
(vii) Set of children in all the schools of Delhi.
(viii) {....., -4, -2, 0, 2, 4, 6, 8}.

ix. {-12, -9, -6, -3, 0, 3, 6, ...}
x. {Number of points in a line segment 4 cm long}.

Solution :

i- We know, integers are infinite.
Hence, set of integers are infinite.

ii- We know multiple of 5 are infinite.
Hence, set of {multiple of 5} is infinite.

iii- There are infinite number of fraction between 1 and 2.
Hence, set {fraction between 1 and 2} is infinite.

iv- There is finite number of people in India.
Hence, set {Number of people in India} is finite.

v- There are infinite number of trees in world. Hence, set ~~of~~ tree in world is infinite.

~~5. State wh~~

vi- There is finite number of leaves on a tree.
Hence, the set of leaves on a tree is finite.

vii- We know that children in all schools of Delhi are counted.
Hence, the set of children in all the school of

Delhi are finite.

viii- There is/are uncounted numbers of integers in this set.
Hence, the set is infinite.

ix- There are ~~uncounted~~ uncounted positive integers in this set.
Hence, the set is infinite.

x- uncounted number of points in a line segment
Hence, the set is infinite.

5. State whether or not the following sets are empty:

(i) {Prime numbers divisible by 2}
(ii) {Negative natural numbers}
(iii) {Women with height 5 metre}
(iv) {Integers less than 5}
(v) {Prime numbers between 17 and 23}
(vi) {Set of even numbers not divisible by 2.}
(vii) Set of multiples of 3 that are more than 9 and less than 15

Solution:

i- Not empty
ii- Empty
iii- Empty
iv- Not empty
v- Not empty
vi- Empty
vii- Not empty

6. State if the given pairs of sets are equal sets or equivalent sets :

(i) {Naturals number less than five} and {Letters of the word 'Boat'}

(ii) {2, 4, 6, 8, 10} and {even natural number less than 12}

(iii) {1, 3, 5, 7.....} and set of odd natural numbers.

(iv) {Letters of the word 'Member'} and {Letters of the word 'Remember'}.

(v) {Negative natural numbers} and {5th month of a day}

(vi) {Even natural numbers} and {odd natural numbers}

Solution :

i- {Natural numbers less than five} and {Letters of the word 'Boat'}.
Here both the have same numbers of element.
Hence, the given set of pair is equivalents.

ii- {2, 4, 6, 8, 10} is the roster form for the even natural numbers less than 12.
Hence, the given set of pair is equal.

iii- ~~{2, 4, 6, 8, 10} is the~~

iii- {1,3,5,7 ....} is the Roster form the set of odd natural numbers.
Hence, the given set of pairs is equal.

iv- {Letters of the word 'MEMBER'} and {Letters of the word 'Remember'}
Here, the letters of both the sets are same
Hence, the given set of pair is equal.

v- We know, there is no negative natural number and their is no month which has 50 days.
Thus both sets are empty.
Hence, the given set of pair is equal.

vi- {Even natural numbers} and
{odd natural numbers}
Hence the given set of pair is equivalent.

7. State wheather the following are finite or infinite sets:

(i) {2,4,6,8, ... 800}
(ii) {..... -5, -4, -3, -2}
(iii) {X: X is an integer between -60 and 60}
(iv) {No. of electrical appliances working in your house}
(v) {X: X is a whole number greater than 20}

Solution:
i- Finite
ii- infinite

iii- Finite
iv- Infinite
v- Finite

8- For each statement, given below, write True or false.

(i) {....., -8, -4, 0, 4, 8} is a finite
(ii) {-32, -28, -24, -20, ..., 0, 4, 8, 16} is an infinite set.
(iii) {x : x is a natural number less than 1} is the empty set.
(iv) {Whole numbers between 15 and 16} = {Natural numbers between 5 and 6}.
(v) {odd numbers divisible by 2} is the empty set.
(vi) {Even natural numbers divisible by 3} is the empty set.
(vii) {x : x is positive and x < 0} is the empty set.
(viii) {....., -5, -3, -1, 1, 3, 5, ...} is a finite set.

Solution:

i- False
ii- False
iii- True
iv- True
v- True
vi- False
vii- True
viii- False

9. State giving reasons, which of the following pairs of sets are disjoint sets and which are overlapping sets:

(i) A = {Girls with ages below 15 years} and
B = {Girls with ages above 15 years}

(ii) C = {Boys with ages above 20 years} and
D = {Boys with ages above 27 years}

(iii) A = {Natural numbers between 35 and 60} and
B = {Natural numbers between 50 and 80}

(iv) P = {students of class IX studying C.B.S.E. Board}
Q = {Students of class IX}

(v) A = {Natural numbers that are multiple of 3 and less than
B = {Natural numbers divisible by 4 and between 20 & 45}

(vi) P = {Letters in the word 'ALLAHABAD'} and
Q = {Letters in the word 'MUSSOORIE'}

Solution:

i- Disjoint sets; as no girl can be age of 15 years
ii- Overlapping sets; as boys above 27 years are also above 20 years.
iii- Overlapping sets; as natural numbers from 50 to 59 are common to both the sets.
iv- Overlapping sets: as student of class IX studying in C.B.S.E are common}
v- Overlapping set; as natural number 24 is common to both the sets.

vi- Disjoint sets as no laetterz is common to both the sets.