Exercise 10(2)

1) State, whether the given sets is infinite or finite:

i) $\{3, 5, 7, \dots\}$

Ans - The given set is Infinite.

ii) $\{1, 2, 3, 4\}$

Ans - The given Set is finite.

iii) $\{\dots, -3, -2, -1, 0, 1, 2\}$

Ans - The given set is infinite.

iv) $\{20, 30, 40, 50, \dots 200\}$

Ans - The given set is finite.

2) Which of the following sets is empty?

i) Set of counting numbers between 5 and 6.

Ans - The given set is empty.

ii) Set of Odd numbers between 7 and 19.

Ans - The given set is not empty.

iii) Set of odd numbers between 7 and 9.

Ans - The given set is empty.

iv) Set of even numbers that are not divisible by 2.

Ans - The given set is empty.

v) $\{0\}$

Ans - The given set is not empty.

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

i) $\{3, 5, 7\}$ and $\{5, 3, 7\}$

Ans - The given set is Equal set.

ii) $\{8, 6, 10, 12\}$ and $\{3, 2, 4, 6\}$

Ans - The given set is Equivalent set.

iii) $\{7, 7, 2, 1, 2\}$ and $\{1, 2, 7\}$

Ans - The given set is a Equal set.

iv) $\{2,4,6,8,10\}$ and $\{a,b,d,e,m\}$

Ans- The given set is Equivalent set,

v) $\{5,5,2,4\}$ and $\{5,4,22\}$

Ans- The given set is a Equal set,

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

i) Set of Integers

Ans- The given set is Infinite,

ii) $\{$Multiples of $5\}$

Ans- The given set in Infinite,

iii) $\{$Fracting between 1 and 2$\}$

Ans- The given set is Infinite,

iv) $\{$Number of people in India$\}$

Ans- The given set is Finite,

v) Set of trees in the world.

Ans- The given set is Infinite

vi) Set of leaves on a tree.

Ans- The given set is finite.

vii) Set of children in all schools of Delhi.

Ans- The given set is finite,

viii) $\{......, -4, -2, 0, 2, 4, 6, 8\}$

Ans- The given set is Infinite.

ix) $\{-12, -9, -6, -3, 0, 3, 6, ...\}$

Ans- The given set is Infinite,

x) $\{$Number of points in a line segment 4cm long$\}$

Ans- The given set is Infinite,

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

i) {Prime numbers divisible by 2}

Ans- The given set is not empty.

ii) Negative natural numbers.

Ans- The given set is Empty.

iii) {woman with height 5 metre}

Ans- The given set is Empty.

iv) {Integers less than 5}

Ans- The given set is not Empty.

v) {Prime numbers between 17 and 23}

Ans- The given set is not Empty.

vi) {Set of even numbers ~~less that~~ not divisible by 2}

Ans- The given set is empty.

vii) Set of multiples of 3 that are more than 9 and less than 15.

Ans- The given set is not empty.

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

i) {Natural numbers less than five} and {Letters of the word 'BOAT'}.

Ans- The given set is Equivalent.

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

Ans- The given set is Equal.

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

Ans- The given set is Equal.

iv) {Letters of the word MEMBER} and {Letters of the word 'REMEMBER}

Ans- The given set is Equal.

v) {Negative natural number} and {50th day of a month}

Ans- The given set is Equal and Equivalent.

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

Ans- The given set is Equivalent.

7. State whether the following are finite or infinite sets:
   i) {2,4,6,8,.....,800}
   Ans- The given set is finite.
   ii) {....,-5,-4,-3,-2}
   Ans- The given set is infinite.
   iii) {x: x is an integer between -60 and 60}
   Ans- The given set is finite.
   iv) {No. of electrical appliances working in your house}
   Ans- the given set is finite.
   v) {x: x is a whole number greater than 20}
   Ans- The given set is infinite.
   vi) {x: x is a whole number less than 20}
   Ans- The given set is finite

8. For each statement given below write True or False:
   i) {....,-8,-4,0,4,8} is a finite set.
   Ans- The given statement is False.
   ii) {-32,-28,-24,-20,...., 0,4,8,16} is an infinite set.
   Ans- The given statement is False.
   iii) {x: x is a natural number less than 1} is an empty set.
   Ans- The given statement is True.
   iv) {whole numbers between 5 and 16} = {Natural numbers between 5 and 16}
   Ans- The given statement is True
   v) {odd numbers divisible by 2} is an empty set.
   Ans- The given statement is True.
   vi) {Even natural numbers divisible by 3} is an empty set.
   Ans- The given statement is False.
   vii) {x: x is positive and x < 0} is the empty set.
   Ans- The given statement is True
   viii) {....,-5,-3,-1,1,3,5...} is a infinite set.
   Ans- The given statement is 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}

Ans: Disjoint set : as no girl can be of age below 15 years and also above 15 years.

ii) C = {Boys with ages above 20 years} and
    D = {Boys with ages above 21 years}

Ans- Overlapping sets : as boys above 21 year are also above 20 years.

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

Ans- Overlapping sets : as natural numbers from 50 to 59 are common to both sets.

iv) P = {Students of class IX studing in I.C.S.E Board} and
    Q = {Students of class IX}

Ans - Overlapping sets : as students of class IX studying in I.C.S.E Board are common.

v) A = {Natural numbers that are multiples of 3 and less than 30} and
   B = {Natural numbers divisible by 4 and lying between 20 and 45}

Ans- Overlapping sets : as the natural number 24 is common in both the sets.

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

Ans- Disjoint set : as no letter is common to both the sets.