Ex. 10.5

1) State wheather the given set is finite or infinite.

i) $\{3, 5, 7, \ldots\}$ → Infinite set

ii) $\{1, 2, 3, 4\}$ → Finite set

iii) $\{\ldots, -3, -2, -1, 0, 1, 2\}$ → Infinite set

iv) $\{20, 30, 40, 50, \ldots, 200\}$ → Finite set

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2) Which of the following sets is empty?

i) Set of counting numbers between 5 and 6.

Ans→ yes, they are empty set.

ii) Set of odd numbers between 7 and 19.

Ans→ No, they are not empty.

iii) Set of odd numbers between 7 and 9.

Ans→ yes, they are empty.

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

Ans→ yes, they are empty.

v) {0}

Ans→ yes, they are 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→ They are both equal and equivalent.

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

Ans→ They are equivalent.

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

Ans→ They are equal.

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

Ans→ They are equivalent.

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

i) Set of integers

Ans→ Infinite Set

ii) {Multiples of 5}

Ans→ Infinite Set

iii) {fractions between 1 and 2}

Ans→ Infinite Set

iv) {Number of people in India}

Ans→ Infinite Set

v) Set of trees in the world.

Ans→ Infinite Set

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vi) Set of leaves on a tree.

Ans → Finite set

vii) Set of children in all the schools of Delhi.

Ans → Finite set

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

Ans → Infinite set

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

Ans → Infinite Set

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

Ans → Finite Set

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

i) Not empty

ii) Empty

iii) Empty

iv) Not Empty

v) Not Empty

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vi) Empty

vii) Not Empty

6) i) Equivalent set

ii) Equal set

iii) Equal set

iv) Equal set

v) Equal set

vi) Equivalent set

7) State whether the following are finite or infite sets.

i) {2, 4, 6, 8, ..., 800}

Ans→ Finite set

ii) {....., -5, -4, -3, -2}

Ans→ Infinite set

iii) {x : x is an integer between -60 and 60}

Ans→ Finite set

iv) {No. of electrical appliances working in your house}.

Ans→ Finite set

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v) $\{x : x$ is a whole number greater than 20$\}$.

Ans → Infinite Set

vi) $\{x : x$ is a whole number less than 20$\}$.

Ans → Finite Set

* Disjoint set → If two given sets have no elements in common, they are disjoint sets.

* Overlapping set → If two given sets have at least one element in common, they are said to be overlapping sets. Ex → $A = \{1, 2, 9, 10\}$ and $B = \{2, 1, 3, 5\}$

8) For each statement given below, write True or False:

i) $\{\ldots, -8, -4, 0, 4, 8, \}$ is a finite set. False

ii) $\{-32, -28, -24, -20, \ldots, 0, 4, 8, 16\}$ is a infinite set. False

iii) $\{x : x$ is a natural number less than 1$\}$ is the empty set. True

iv) {Whole numbers between 15 and 16} = { Natural numbers

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between 5 and 6}. True

v) {Odd numbers divisible by 2} is the empty set. True

vi) {Even natural numbers divisible by 3} is the empty set. False

vii) {x: x is the positive and x < 0} is the empty set. False

viii) {..., -5, -3, -1, 1, 3, 5, ...} is a finite set. 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 = {Girs with ages above 15 years}

Ans→ Disjoint sets; as the girls with ages below 15 years and girls below 15 years could not be same.

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

Ans→ Overlapping sets; as the boys above 20 years can be

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30 years, 40 years etc. They can belong to above 27 years as they can be 30 years, 40 years, etc.

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

Ans→ Overlapping sets; as the natural numbers between 35 and 60, 50 and 80 → 51, 52, 53, 54, 55, 56, 57, 58, 59 are the same elements in both the sets.

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

Ans→ Overlapping sets; as the Students reading in Class IX I.C.S.E. Board and Students reading in Class IX are the same.

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}.

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Ans→ Overlapping sets; as natural number 24 is common to both the sets.

ii) P = {Letters in the word 'ALLAHABAD'} and

Q = {Letters in the word 'MUSSOORIE'}

Ans→ Disjoint sets; as no letters is same in both the words.

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