

EXERCISE 10(D)

Question 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}
- (v) {7, 14, 21,....., 2401}

Solution:

- (i) Infinite
- (ii) Finite
- (iii) Infinite
- (iv) Finite
- (v) Finite

Question 2.

- (i) Which of the following sets is empty?
- (ii) Set of counting numbers between 5 and 6.
- (iii) Set of odd numbers between 7 and 19. Set of odd numbers between 7 and 9.
- (iv) Set of even numbers which are not divisible by 2.
- (v) {0}.

Solution:

- (i), (iii) and (iv)

Question 3.

State, which pair of sets, given below, are equal sets or equivalent sets:

- (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}
- (v) {5, 5, 2, 4} and {5, 4, 2, 2}

Solution:

- (i) Equal
- (ii) Equivalent
- (iii) Equal
- (iv) Equivalent
- (v) Equal

Question 4.

State, which of the following are finite or infinite sets :

- (i) Set of integers
- (ii) {Multiples of 5}
- (iii) {Fractions 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) Infinite
- (ii) Infinite
- (iii) Infinite
- (iv) Finite
- (v) Infinite
- (vi) Finite
- (vii) Finite
- (viii) Infinite
- (ix) Infinite
- (x) Infinite

Question 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, which 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



Question 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'}.
- (ii) {2, 4, 6, 8, 10} and {even natural numbers 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 {50th day of a month}
- (vi) {Even natural numbers} and {odd natural numbers}.

Solution:

- (i) Equivalent
- (ii) Equal
- (iii) Equal
- (iv) Equal
- (v) Equal
- (vi) Equivalent

Question 7.

State, whether 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}
- (vi) {x : x is a whole number less than 20}

Solution:

- (i) Finite
- (ii) Infinite
- (iii) Finite
- (iv) Finite
- (v) Infinite
- (vi) Finite

Question 8.

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

- (i) {..., -8, -4, 0, 4, 8} is a finite set.
- (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 (each set is the empty set)
- (v) True
- (vi) False (6 is an even natural number which is divisible by 3)
- (vii) True (no positive number can be less than 0)
- (viii) False

Question 9.

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

- (i) $A = \{\text{Girls with ages below 15 years}\}$ and $B = \{\text{Girls with ages above 15 years}\}$
- (ii) $C = \{\text{Boys with ages above 20 years}\}$ and $D = \{\text{Boys with ages above 27 years}\}$
- (iii) $A = \{\text{Natural numbers between 35 and 60}\}$ and $B = \{\text{Natural numbers between 50 and 80}\}$
- (iv) $P = \{\text{Students of class IX studying in I.C.S.E. Board}\}$ and $Q = \{\text{Students of class IX}\}$
- (v) $A = \{\text{Natural numbers multiples of 3 and less than 30}\}$ and $B = \{\text{Natural numbers divisible by 4 and between 20 and 45}\}$
- (vi) $P = \{\text{Letters in the word 'ALLAHABAD'}\}$ and $Q = \{\text{Letters in the word 'MUSSOORIE'}\}$

Solution:

- (i) Disjoint sets; as no girl can be of age below 15 years and also above 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 students of class IX studying in I,C.S.E. board are common.
- (v) Overlapping sets; as natural number 24 is common to both the sets.
- (vi) Disjoint sets; as no letter is common to both the sets.