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(iii) $C = \{-2, -1, 0, 1, 2\}$

(iv) $D = \{L, O, Y, A\}$

(v) $E = \{\text{February, April, June, September, November}\}$

(vi) $F = \{b, c, d, f, g, h, j\}$.

6. Match each of the sets on the left in the roster form with the same set on the right described in the set builder form :

(i) $\{1, 2, 3, 6\}$

(ii) $\{2, 3\}$

(iii) $\{M, A, T, H, E, I, C, S\}$

(iv) $\{1, 3, 5, 7, 9\}$

(a) $\{x : x \text{ is a prime number and a divisor of } 6\}$

(b) $\{x : x \text{ is an odd natural number less than } 10\}$

(c) $\{x : x \text{ is a natural number and divisor of } 6\}$

(d) $\{x : x \text{ is a letter of the word MATHEMATICS}\}$

Sol. (i) \leftrightarrow (c)

(ii) \leftrightarrow (a)

(iii) \leftrightarrow (d)

(iv) \leftrightarrow (b)

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N.D. STUDY MATERIAL BASED ON

2. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol \in or \notin in the blank spaces.

- (i) $5 \dots\dots\dots A$ (ii) $8 \dots\dots\dots A$ (iii) $0 \dots\dots\dots A$
(iv) $4 \dots\dots\dots A$ (v) $2 \dots\dots\dots A$ (vi) $10 \dots\dots\dots A$
Sol. (i) $5 \in A$ (ii) $8 \notin A$ (iii) $0 \notin A$
(iv) $4 \in A$ (v) $2 \in A$ (vi) $10 \notin A$

3. Write the following sets in the roster form :

- (i) $A = \{x : x \text{ is an integer and } -3 \leq x < 7\}$
(ii) $B = \{x : x \text{ is a natural number less than 6}\}$
(iii) $C = \{x : x \text{ is a two digit natural number such that sum of its digits is 8}\}$
(iv) $D = \{x : x \text{ is a prime number which is a divisor of 60}\}$
(v) $E = \text{the set of all letters in the word TRIGONOMETRY.}$
(vi) $F = \text{the set of all letters in the word BETTER.}$

- Sol. (i) $A = \{-3, -2, -1, 0, 1, 2, 3, 4, 5, 6\}$
(ii) $B = \{1, 2, 3, 4, 5\}$
(iii) $C = \{17, 26, 35, 44, 53, 62, 71, 80\}$
(iv) $D = \{2, 3, 5\}$
(v) $E = \{T, R, I, G, O, N, M, E, Y\}$
(vi) $F = \{B, E, T, R\}$

4. Write the following sets in the set builder form :

- (i) $\{3, 6, 9, 12\}$ (ii) $\{2, 4, 8, 16, 32\}$ (iii) $\{5, 25, 125, 625\}$
(iv) $\{2, 4, 6, \dots\}$ (v) $\{1, 4, 9, \dots, 100\}$

Sol. (i) $A = \{x : x \text{ is a natural number multiple of 3 and } x < 15\}$

- (i) $B = \{x : x = 2^n, n \in \mathbb{N} \text{ and } n < 6\}$
(iii) $C = \{x : x = 5^n, \text{ and } n \in \mathbb{N} \text{ and } n \leq 4\}$
(iv) $D = \{x : x \text{ is an even natural number}\}$
(v) $E = \{x : x = n^2, n \in \mathbb{N} \text{ and } n < 11\}$

5. List all the elements of the following sets :

- (i) $A = \{x : x \text{ is an odd natural number}\}$
(ii) $B = \left\{ x : x \text{ is an integer, } -\frac{1}{2} < x < \frac{9}{2} \right\}$
(iii) $C = \{x : x \text{ is an integer, } x^2 \leq 4\}$
(iv) $D = \{x : x \text{ is a letter in the word "LOYAL"}\}$
(v) $E = \{x : x \text{ is a month of a year not having 31 days}\}$
(vi) $F = \{x : x \text{ is a consonant in the English alphabet which precedes } k\}$.

Sol. (i) $A = \{1, 3, 5, 7, \dots\}$

(ii) $B = \{0, 1, 2, 3, 4\}$

Q1
Ex-
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- (ii) The collection of ten most talented writers of India.
- (iii) A team of eleven best cricket batsmen of the world.
- (iv) The collection of all boys in your class.
- (v) The collection of all natural numbers less than 100.
- (vi) A collection of novels written by the writer Munshi Prem Chand.
- (vii) The collection of all even integers.
- (viii) The collection of questions in this chapter.
- (ix) A collection of most dangerous animals of the world.

Sol. (i) We can definitely say that the members of this collection are : January, June, July.

So, this collection is well-defined and hence, it is a set.

(ii) The term 'most talented' is a vague term. A writer may be most talented to one person and may not be so to the other.

Thus, we cannot judge definitely which writers are there in our collection.

∴ This collection is not well-defined and hence, it is not a set.

(iii) The term 'best' is a vague term. A batsmen may be best to one person and may not be so to the other.

Thus, we cannot judge definitely which batsmen are there in our collection.

∴ This collection is not well-defined and hence, it is not a set.

(iv) We will definitely say that the members of this collection are your classfellows.

∴ This collection is well-defined and hence, it is a set.

(v) Clearly, the members of collection are 1, 2, 3, ..., 97, 98, 99.

∴ This collection is well-defined and hence, it is a set.

(vi) Clearly, the members of collection are the novels written by Munshi Prem Chand.

∴ This collection is well-defined and hence, it is a set.

(vii) We can definitely say that the members of this collection are 2, 4, 6, ...

∴ This collection is well-defined and hence, it is a set.

(viii) Clearly, the members of the collection are the different questions of this chapter.

So, it is well-defined and hence, it is a set.

(ix) The term 'most dangerous' is a vague term. An animal may be most dangerous to one person and may not be so to the other.

So, it is not a set.