

CHAPTER 4

SETS

More Questions for Practice

- Let $A = \{1, 2, 4, 7, 9, 13, 15\}$, $B = \{3, 4, 7, 10, 12\}$ and $C = \{5, 8, 11, 14\}$. Which of the following statements are *true* and which are *false*?
(a) $7 \in C$ (b) $7 \notin A$ (c) $9 \notin B$ (d) $12 \in B$.
- Write each of the following sets in *Roster Form*:
 - The set of first five even numbers.
 - The set of first four prime numbers.
 - The set of all the seven colours in the rainbow.
 - The set of any three political parties of India.
- Write each of the following sets in *Roster Form*:
 - $E = \{x \mid x \text{ is an even prime number}\}$.
 - $F = \{x \mid x \text{ is a multiple of 2 but the multiple does not exceed 20}\}$.
 - $G = \{x \mid x \text{ is a counting number that lies between 5 and 12}\}$.
- Which of the following sets are *empty sets*?
 - $A =$ set of triangles with two right angles.
 - $B =$ set of natural numbers, greater than 6 but less than 4.
 - $C = \{x \mid x \in W \text{ such that } x + x = x\}$.
- State whether the following sets are *finite* or *infinite sets*:
 - The set of all even numbers.
 - The set of all decimals between 0 and 1.
 - The set of all schools in Chennai.
 - The set of all points common to two given parallel lines.
- Write each of the following sets in *Roster Form*:
 - $E = \{x \mid x \text{ is a whole number and } 14 < x < 15\}$.
 - $F = \{x \mid x \text{ is a factor of 17}\}$.
- Write each of the following sets in *Set-builder Form*:
 - $A = \{5, 10, 15, 20, 25\}$.
 - $B = \{a, e, i, o, u\}$.
- Write the following set using *Set-builder form*:
 - $\left\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots\right\}$
 - $\left\{\frac{1}{2}, 1, 1\frac{1}{2}, 2, 2\frac{1}{2}, 3, 3\frac{1}{2}, 4, 4\frac{1}{2}\right\}$.
- Show that the set of letters needed to spell 'CATARACT' and the set of letters needed to spell 'CARAT' are equal.
- Which of the following are *empty sets*?
 - $A = \{x \mid x \text{ is the difference of 19 and 19}\}$.
 - $B = \{x \mid x \text{ is an acute angle in a rectangle ABCD}\}$.
 - $C = \{x \mid x \text{ is a point where parallel lines } l \text{ and } m \text{ meet}\}$.

11. Which of the following are *singleton sets*?
- (a) $A = \{x \mid x \text{ is factor of } 13, x \neq 1\}$.
 (b) $B = \{x \mid x \text{ is the quotient of all prime number divided by themselves}\}$.
 (c) $C = \{x \mid x \in W, x + 7 = 7\}$.
 (d) $D = \{x \mid x \text{ is an even prime number, } x \neq 2\}$.
12. Write the cardinal number of each of the following sets:
- (a) $A = \{x : x \text{ is a month of a year}\}$.
 (b) $B = \{x : x \text{ is a whole number different from a natural number}\}$.
 (c) $C = \{x : x \text{ is a letter of the word "INFINITE"}\}$.

ANSWERS

1. (a) False (b) False (c) True (d) True
2. (a) $\{2, 4, 6, 8, 10\}$ (b) $\{2, 3, 5, 7\}$
 (c) {Violet, Indigo, Blue, Green, Orange, Yellow, Red} (d) {BJP, SP, BSP}
3. (a) $E = \{2\}$ (b) $F = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$ (c) $G = \{6, 7, 8, 9, 10, 11\}$
4. (a) and (b) 5. Finite sets—(c), (d) Infinite sets—(a), (b)
6. (a) $E = \phi$ (b) $F = \{1, 17\}$
7. (a) $A = \{x \mid x \text{ is multiple of } 5 \text{ between } 1 \text{ and } 26\}$
 (b) $B = \{x \mid x \text{ is a vowel of English alphabet}\}$
8. (a) $\left\{x \mid x = \frac{1}{y}, y \in \mathbb{N}\right\}$ (b) $\left\{x \mid x \text{ is a multiple of } \frac{1}{2} \text{ and } x < 5\right\}$
10. (b) and (c) 11. (a), (b) and (c) 12. (a) 12 (b) 1 (c) 5.