MATHS

BOOKS - CALCUTTA BOOK HOUSE MATHS (BENGALI ENGLISH)

SET THEORY

Examples

1. State whether one of the followings are sets and which one are not:

A=The students of serial no. 1 to 10 of class IX,

2. State whether one of the followings are sets and which one are not:

B=The brilliant students of class IX,

3. State whether one of the followings are sets and which one are not:

C=The wild beasts of a forest,

4. State whether one of the followings are sets

and which one are not:

D=Set of irrational numbers.

5. Express the following sets in Roster method:

Set of all the prime numbers between 1 to 20,

6. Express the following sets in Roster method:

Vowels of the english alphabets,

7. Express the following sets in Roster method:

The set of all the factors of 12,

8. Express the following sets in Roster method:

Set of positive even whole numbers.

▶ **Watch Video Solution**

9. Express the following sets In set-builder method:

A=Set of natural numbers 4 or greater than 4 and smaller than 18.

▶ **Watch Video Solution**

10. Express the following sets In set-builder method:

B=(7,14,21,28,........)

> ▶ **Watch Video Solution**

11. Express the following statements by set symbols:

x is not a member of the set A,

> ▶ **Watch Video Solution**

12. Express the following statements by set symbols:

B is a subset of C,

▶ **Watch Video Solution**

13. Express the following statements by set symbols:

R is the super set of Q,

▶ **Watch Video Solution**

14. Express the following statements by set symbols:

A is a set consisting of the roots of the equation $x^2 - 3x + 2 = 0$.

▶ Watch Video Solution

15. Which of the following sets are null sets?

A=$(n: n \in N$ and $n < 4$ and $n > 7\}$,

▶ Watch Video Solution

16. Which of the following sets are null sets?

B={0},

17. Which of the following sets are null sets?

C=$\{x : x \in W$ and $-3 < x < -2\}$,

18. Which of the following sets are null sets?

D=$\{x : x$ is a prime number and $6 < x < 8\}$.

19. Find whether the given pair of sets are equal or not:

A={1,2} B=$\{x : 0 < x < 3 \text{ and } x \in N\}$,

20. Find whether the given pair of sets are equal or not:

$C = \phi, D = \{\phi\}$,

21. Find whether the given pair of sets are equal or not:

X={$x : x$ is an alphabet of the word MARCH}, Y={$y : y$ is an alphabet of the word CHARM},

22. Find whether the given pair of sets are equal or not:

P={1,5}, Q={$x : x^2 - 7x + 10 = 0, x \in R$}

23. Find which of the following operations by Venn diagrams,

X=$\{x : x$ is a rational number and $-1 < x < 1$ $\}$,

24. Find which of the following operations by Venn diagrams,

Y={y : y is a prime number and $y < 10$},

25. Prove the following operations by Venn diagrams,

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$

26. Prove the following operations by Venn diagrams,

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

27. Prove the following operations by Venn diagrams,

$$(A \cup B)^c = A^c \cap B^c$$

28. Prove the following operations by Venn diagrams,

$$(A \cap B)^c = A^c \cup B^c$$

Exercise 1

1. State which of the following are sets and which are not:

A=A group of students of class-IX having heights from 4ft to 5ft,

2. State which of the following are sets and which are not:

B=A group of intelligent womens in your para,

▶ **Watch Video Solution**

3. State which of the following are sets and which are not:

C=A group of your school teachers,

▶ **Watch Video Solution**

4. State which of the following are sets and which are not:

D=A group of beautiful girls of your class.

▶ **Watch Video Solution**

5. Express the following sets in Roster method, X= set of prime numbers in between 20 and 30,

▶ **Watch Video Solution**

6. Express the following sets in Roster method,

Y={$y: y \in N$ and $1 \leq y \leq 8$},

7. Express the following sets in Roster method,

P={$x: x \in R$ and $x^2 - 5x + 4 = 0$},

8. Express the following sets in Roster method,

Q=$\{z : z$ is a letter of the word BEAUTIFUL$\}$,

▶ **Watch Video Solution**

9. Express the following sets in set-builder method:

A=set of different letters of the word EXAMINATION

▶ **Watch Video Solution**

10. Express the following sets in set-builder method:

$$B = \left\{ 0, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \ldots\ldots \right\},$$

▶ **Watch Video Solution**

11. Write whether the set is finite or infinite:

C=set of all real numbers from 1 to 11,

▶ **Watch Video Solution**

12. Express the following sets in set-builder method:

D={4,8,12,16,20,......}

▶ **Watch Video Solution**

13. Express the following statements by set symbols,

x is an element of the set X,

▶ **Watch Video Solution**

14. Express the following statements by set symbols,

y is not an element of the set Y,

▶ **Watch Video Solution**

15. Express the following statements by set symbols,

A is a proper subset of B,

▶ **Watch Video Solution**

16. Express the following statements by set symbols,

P is a super set of Q,

▶ **Watch Video Solution**

17. Express the following statements by set symbols,

C is not a subset of D,

▶ **Watch Video Solution**

18. Express the following statements by set symbols,

The set S consists of the root of the equation $x^2 - 5x + 6 = 0$.

19. Which of the sets of the following sets are null sets? Give reasons infavour of your answers:

$X = \{0\}$,

20. Which of the sets of the following sets are null sets? Give reasons infavour of your answers:

$Y = \phi,$

21. Which of the sets of the following sets are null sets? Give reasons infavour of your

answers:

P=$\{x : x \in R \text{ and } x^2 + 1 = 0\}$

22. Which of the sets of the following sets are null sets? Give reasons infavour of your answers:

Q=$\{x : 2x + 8 = 0 \text{ and } x \in N\}$

23. Write with reasons whether the following pair of sets are equal or not,

$A = \phi$ and $B = \{\phi\}$

▶ Watch Video Solution

24. Write with reasons whether the following pair of sets are equal or not,

P={1} and Q$\{x : x$ is a digit of the number 111},

▶ Watch Video Solution

25. Write with reasons whether the following pair of sets are equal or not,

X={1,2,3} and Y={2,1,3,1,2,3,3},

26. Write with reasons whether the following pair of sets are equal or not,

C={x:x is a letter of a word SCOTLAND and D= {S,C,O,T,L,A,N,D}

27. Find which of the following sets are infinite and which are infinite sets:

A=$\{x : x \in R \text{ and } 0 < x < 2\}$,

▶ **Watch Video Solution**

28. Find which of the following sets are infinite and which are infinite sets:

B=$\{x : x$ is a positive whole number and $x < 7\}$,

▶ **Watch Video Solution**

29. Find which of the following sets are finite and which are infinite sets:

C=$\{x : x \in R$ and $x^2 - 1 = 0\}$

30. Find which of the following sets are infinite and which are infinite sets:

D=$\{n : n = \dfrac{x}{x+1}$, where $x \in N$ and $x < 3\}$,

31. IF A={1,3,5,7} and B={2,3,4,5} then find $A \cup B$

,

32. IF A={1,3,5,7} and B={2,3,4,5} then find $A \cap B$

,

33. IF A={1,2,3,4,5} and U={0,1,2,3,4,5,6,7,8,9}, then find A^c.

34. Prove by Venn diagram:

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C),$$

35. Prove by Venn diagram:

$$(A \cup B)^c = A^c \cap B^c$$

36. Prove by Venn diagram:

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C),$$

▶ **Watch Video Solution**

37. Prove by Venn diagram:

$$(A \cap B)^c = A^c \cup B^c$$

▶ **Watch Video Solution**