SETS

1. Which of the following is not a sets
   A) The collection of all the months of a year beginning with the letter J
   B) The collection of all boys in your class.
   C) The collection of ten most talented writers of India.
   D) The collection of all natural numbers less than 100.
   ANSWER:
2. The set of intelligent students in a class is

   A)A null set B) A singleton set

   C)A finite set D) Not a well defined collection

3. The set {x : x is a positive integer and $x^2 < 40$} in the roster form is
   A) {1, 2, 3, 4, 5} B) {1, 4, 9, 16, 25, 36}
   C) {49, 64, 81, 100,….} D) {1, 2, 3, 4, 5, 6}.
   ANSWER:

4. The set A = {1, 4, 9, 16, 25, . . . } in set-builder form

   A) {x : x = 2n-1, where n ∈ N} B) { x : x = 3n-2, where n ∈ N }

   C) { x : x = n^2, where n ∈ N} D) { x : x = 2n, where n ∈ N }.

   ANSWER:

5. The set {x : x is a prime number which is divisor of 60} in the roster form is
   A) {1, 2, 3, 4, 5,6,10,12,15,20,30,60} B) {1,2, 3, 5}
   C) {2,3,5} D) {2, 3}.
   ANSWER:

6. The set {x : x is a letter of the word MATHEMATICS},in the roster form is

   A) {M,A,T,H,E,M,A,T,I,C,S } B) {M,A,T,H,E,I,C,S }
   C) {H,E,M,A,T,I,S } D) { H,E,M,A,T,I,C }.
   ANSWER:

7. The set {x : x≠ x} represents

   A) {0} B){ } C){1} D) { Ø }

   ANSWER:

8. Which of the following sets is not disjoint set.

   A) $\{1,2,3\}$ and $\{x \mid x \in N,\ x \geq 4 \ \& \ x \leq 6\}$

   B) $\{a, e, i, o, u\}$ and $\{c, d, g, f\}$

   C) {x|x is an even integer } and {x|x is a odd integer}

   D) {x|x is a positive prime ≤ 10} and {x|x is a positive even integer ≤ 10 }.

   ANSWER:

9. If R is the set of real number and Q is the set of rational number then, $R - Q$ is

   A) set of real number B) set of rational number

C) set of irrational number D) set of integer number.
ANSWER:

10. If A$\subset B$ Then the number of elements in $A \cup B$ is equal to

A)n(A) B)n(B) C) n(A)+ n(B) D) n(A)- n(B).

ANSWER:

11.Let U $= \{1,2,3,4,5,6,7,8,9\}$,A $= \{1, 3, 5, 7,9\}$ then the complement of set A is

A) {1, 3, 5, 7,9} B) {2,4,6,8,10} C) {2,4,8} D) {2,4,6,8}.
ANSWER:

12. The number of non-empty subsets of the set {1, 2, 3, 4} is

A) 14 B)15 C)16 D) 17.

ANSWER:

13. If *A* and *B* be any two sets, then $(A \cap B)^1$ is equal to

A) $A^1 \cap B^1$ B) $A^1 \cup B^1$ C) $A \cap B$ D) $A \cup B$

ANSWER:

14. Let A and B be two sets such that $A \cup B = A$. Then, $A \cap B$ is equal to

A) ϕ B) B C) A D) *none of these*

ANSWER:

15. Which of the following set is not empty set.

A) $\{x : 1 < x < 2, x$ is a natural number$\}$.

B) $\{x : x^2 - 1 = 0$ and x is a natural number$\}$.

C) $\{ x : x^2 = 4, x$ is odd $\}$

D) $\{x : x$ is an even prime number greater than $2\}$
ANSWER:

16. The $\{x | x \in R, -5 < x \leq 7\}$ sets as intervals is

A) $(-5,7)$ B) $[-5,7]$ C) $\{-5,7\}$ D) $(-5,7]$.
ANSWER:

17. The $\{x | x \in R, 6 < x < 10\}$ sets as intervals is

A) $(6,10)$ B) $[6,10]$ C) $\{6,10\}$ D) $(6,10]$.
ANSWER:

18. The $\{x | x \in R, x \leq 1\}$ sets as intervals is

A) $(-\infty, 1)$ B) $[-\infty, 1]$ C) $[-\infty, 1)$ D) $(-\infty, 1]$.
ANSWER:

19. The intervals $[-7,12)$ sets

A) $\{x|x \in R, -7 < x \leq 12\}$ B) $\{x|x \in R, -7 \leq x \leq 12\}$

C) $\{x|x \in R, -7 < x < 12\}$ D) $\{x|x \in R, -7 \leq x < 12\}$.

ANSWER:

20. The intervals $(3,8)$ sets

A) $\{x|x \in R, 3 < x \leq 8\}$ B) $\{x|x \in R, 3 \leq x \leq 8\}$

C) $\{x|x \in R, 3 < x < 8\}$ D) $\{x|x \in R, 3 \leq x < 8\}$.

ANSWER:

21. Which of the following set is an infinite set.

A) $\{x : x \in \text{N and } (x-1)(x-2) = 0\}$

B) $\{x : x \in \text{N and } x^2 = 4\}$ $\{x : x \in \text{N and } x^2 = 4\}$

C) $\{x : x \in \text{N and } 2x-1 = 0\}$

D) $\{x : x \in \text{N and } x \text{ is prime}\}$

ANSWER:

22. Which of the following statement is incorrect

A) Every set is a subset of itself

B)Null set is a subset of all sets.

C)If B $\subset$ A and B $\neq A$, then B is called proper subset of A.

D)If the set A contains n elements then the number of possible subsets is given by $2^n - 1$.

ANSWER:

23. The number of proper subsets of the set {1, 2, 3} is

(A)5 B) 6 C) 7 D)8

ANSWER:

24. Which is the following sets are not equal sets.

A) A = {a, b, c, d} and B = {c, a, b, d}

B) A = {1,2,3,4, } and B = {3,2,4,5}

C) A = {2, 4, 6, 8, 10} B = { $x : x$ is positive even integer and $x \leq 10$}

D) A = {x|x is a letter in the word FOLLOW} and
B = {y|y is a letter in the word WOLF}.

ANSWER:

25. The *length of the intervals* (*-5, 7*]

(A) 10 (B) 12 (C) 11 (D) 2

ANSWER:

26. Which of the following statement is correct statement.

A) $A \cup A' = U$ B) $\varphi' \cap A = A$ C) $A \cap A' = \emptyset$ D) $U' \cap A = A$

ANSWER:

27. Which of the following statement is incorrect

A) { a, b } $\not\subset$ { b, c, d }

B) { a, e } $\subset$ { x : x is a vowel in the English alphabet}

C) { a } $\in$ { a, b, c }. D) { a } $\subset$ { a, b, c }.

ANSWER:

28. Let A = { 1, 2, { 3, 4 }, 5 }. Which of the following statement is correct

A){3, 4} $\subset$ A B){3, 4} $\in$ A C){1,2, 3} $\subset$ A D) 4 $\in$ A.

ANSWER:

29. The number of sub set of a set A = φ is

A) 1 B) 2 C) 0 D) 3.

ANSWER:

24. If X= { a, b, c, d } and Y = { f, b, d, g}, then X – Y is

A) {b, d } B) {f, g } C) {a, c } D) { a, c, f, g }.

ANSWER:

30. Which of the following statement is correct

A){ 2, 3, 4, 5 } and { 3, 6} are disjoint sets.

B){ a, e, i, o, u } and { a, b, c, d }are disjoint sets.

C){ 2, 6, 10, 14 } and { 3, 7, 11, 15} are disjoint sets.

D){ 2, 6, 10 } and { 2,3, 7, 11} are disjoint

ANSWER:

31. If U = { a, b, c, d, e, f, g, h}, then the complements of complements of the sets

{a, b, c}

A) { a, b, c } B) { d, e, f, g, h }

C) { a, b, c, d, e, f, g, h } D) {…}.

ANSWER:

32.Let A, B, and C be the sets such that A ∪ B = A ∪ C and A ∩ B = A ∩ C, then

A) B = C B) A = C C) A ∪ B = A D) A ∩ B = A

ANSWER:

33. Which of the following example of the null set

A) Set of odd natural numbers less than 3.

B) Set of even prime numbers

C) { x : x is a natural numbers, x < 5 or x > 7 }

D) { y : y is a point common to any two parallel lines}.

ANSWER:

34. Given the sets A = {1, 3, 5}, B = {2, 4, 6} and C = {0, 2, 4, 6, 8}, which of the following may be considered as universal set (s) for all the three sets A, B and C

A) {0, 1, 2, 3, 4, 5, 6} B) φ

C){0,1,2,3,4,5,6,7,8,9,10} D) {1,2,3,4,5,6,7,8}

ANSWER:

*1 **Mark Questions***

1. Write the solution set of the equation $x^2 + x - 2 = 0$ in roster form.

Ans:

2. Write the set $\{x : x$ is a positive integer and $x^2 < 40\}$ in the roster form.

Ans:

3. rite the set A = {1, 4, 9, 16, 25, . . . }in set-builder form.

Ans:

4. Write the set E=$\left\{\frac{1}{2},\frac{2}{3},\frac{3}{4},\frac{4}{5},\frac{5}{6}\right\}$ in set builder form.

Ans:

5. Write the set of all letters in the word TRIGONOMETRY in the roster form

Ans:

6. Write $\{x : x$ is a two-digit natural number such that the sum of its digits is 8$\}$ in the roster form

Ans:

7. Write $\{x : x$ is an integer and $-3 \leq x < 7\}$ in the roster form

Ans:

8. Write the set {2,4,8,16,32} in set builder form.

Ans:

9. Let A = { *a, e, i, o, u*} and B = { *a, b, c, d*}. Is A a subset of B ? No. (Why?).

Ans:

10. What universal set would you propose (i) The set of right triangles. (ii) The set of isosceles triangles

Ans:

11. Let A = { 2, 4, 6, 8} and B = { 6, 8, 10, 12}. Find A ∪ B.
Ans:

12. Let A = { *a, e, i, o, u* } and B = { *a, i, u* }. Show that A ∪ B = A
Ans:

13. Let A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} and B = { 2, 3, 5, 7 }. Find A ∩ B .
Ans:

14. Let A = { 1, 2, 3, 4, 5, 6}, B = { 2, 4, 6, 8 }. Find A – B
Ans:

15. If X= { *a, b, c, d* } and Y = { *f, b, d, g*}, find Y – X
Ans:

16. If **R** is the set of real numbers and **Q** is the set of rational numbers, then what is **R** – **Q**?
Ans:

17. Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} and A = {1, 3, 5, 7, 9}. Find A′.
Ans:

18. Draw appropriate Venn diagram for each of the following :
(i) $(A \cup B)'$, (ii) $A' \cap B'$, (iii) $(A \cap B)'$, (iv) $A' \cup B'$

Ans:

19. Let U be the set of all triangles in a plane. If A is the set of all triangles with at least one angle different from 60°, what is A′
Ans:

20. Fill in the blanks to make each of the following a true statement :
(i) $A \cup A' = \ldots\ldots$ (ii) $\varphi' \cap A = \ldots.$
(iii) $A \cap A' = \ldots.$ (iv) $U' \cap A = . \ldots\ldots$

21. If A and B are two sets such that $A \subset B$, then what is $A \cup B$ and $A \cap B$?

Ans:

22. Write the following as intervals :
(i) $\{x : x \in R, -4 < x \leq 6\}$ (ii) $\{x : x \in R, -12 < x < -10\}$
(iii) $\{x : x \in R, 0 \leq x < 7\}$ (iv) $\{x : x \in R, 3 \leq x \leq 4\}$

Ans: (i)

(ii)

(iii)

(iv)

23. Write the following intervals in set-builder form :
(i) (– 3, 0) (ii) [6 , 12] (iii) (6, 12] (iv) [–23, 5).

Ans: (i)

(ii)

(iii)

(iv)

2 Mark Questions

1. Write down all the subsets of the following sets
(i) {*a*} (ii) {*a*, *b*} (iii) {1, 2, 3}

Ans :- (i)

(ii)

(iii)

2. Let V = { *a, e, i, o, u* } and B = { *a, i, k, u*}. Find V – B and B – V.
Ans :-

3. Find the union of A = {*x* : *x* is a natural number and $1 < x \leq 6$ }
B = {*x* : *x* is a natural number and $6 < x < 10$ }.
Ans:

4. Find the intersection of A = {x : x is a natural number and multiple of 3}
B = {x : x is a natural number less than 6}.
Ans:

5. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}, find A ∪ B ∪ C .
Ans:

6. Let A= { a, b}, B= {a, b, c}, is A⊂B? what is A∪B?
Ans :-

7. If A= { 3, 5, 7, 9, 11}, B= { 7, 9, 11, 13}, C= {15, 17} find A∩(B∪C).

Ans :-

8. If A= {3, 6, 9, 12, 15, 18, 21} and B= {2, 4, 6, 8, 10, 12, 14, 16}, find

A-B and B-A

Ans:

9. If X= {a, b, c, d} and Y= { b, d, g, f} find X-Y and X∩Y.

Ans :-

10.If U= {1, 2, 3, 4, 5, 6, 7, 8, 9}, A= {1, 2, 3, 4} B= {2, 4, 6, 8},find $(A \cup B)^c$

Ans :-

11. If U= {1, 2, 3, 4, 5, 6, 7, 8, 9}, A= {3, 4, 5, 6} B= {2, 4, 6, 8},

find $(A-B)^c$

Ans :-

12. If A= { 3, 5, 7, 9, 11} B= { 7, 9, 11, 13} C= { 11, 13, 15} D= {15, 17},

find $(A \cap B) \cup (C \cap D)$.

Ans :-

13. Taking set of natural numbers as the universal set, write the

complement of the following sets;

i) { x/ x is an odd natural numbers}, ii) { x/ x is a prime number}

Ans :-

14. Taking set of natural numbers as the universal set, write the complement of the following sets;

i) { x/ x is a natural numbers divisible by 3 and 5},

ii) { x/ x is a perfect square}

Ans :-

15. List all the subsets of the set { –1, 0, 1 }.

Ans:

3 Mark Questions

1. Let U= {1, 2, 3, 4, 5, 6} A= {2, 3}, and B={3, 4, 5}. Show that $(A \cup B)^C = A^C \cap B^C$

Ans :-

2. Let U={1, 2, 3, 4, 5, 6, 7, 8, 9}, A={2, 4, 6, 8}, B={2, 3, 5, 7 }.

Show that $(A \cap B)^C = A^C \cup B^C$.

Ans :-

3. If U = {1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = {2, 4, 6, 8} and B = { 2, 3, 5, 7}. Verify that $(A \cup B)' = A' \cap B'$

Ans :-

4. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15} and D = {15, 17};
find (i) (A ∩ B) ∩ (B ∪ C) (ii) (A ∪ D) ∩ (B ∪ C)

Ans: (i)

(ii)