

QB365

Important Questions - Sets

11th Standard CBSE

Mathematics

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

Section-A

- 1) Which of the following sets are empty set, singleton set and equal set. 2
A={x:2x=10 and x²-7x+10=0}
B={x:x²-16x+55=0 and x²=25}
C={x:- $\frac{1}{2} \leq x \leq \frac{1}{2}$ }, D={x:0≤4x²≤1}
- 2) If U={a,b,c,d,e,f}, A={a,b,c}, B={c,d,e,f}, C={c,d,e}, D={d,e,f}, then tabulate the following set A∩C 2
- 3) If U={a,b,c,d,e,f}, A={a,b,c}, B={c,d,e,f}, C={c,d,e}, D={d,e,f}, then tabulate the following set (U∩φ)' 2
- 4) If U={a,b,c,d,e,f}, A={a,b,c}, B={c,d,e,f}, C={c,d,e}, D={d,e,f}, then tabulate the following set (U∪A)' 2
- 5) In a school there are 20 teachers who teach Maths or Physics.Out of these, 12 teach Maths and 4 teach Physics and Maths.How many teach Physics? 2
- 6) In a committee, 50 people speak Franch, 20 speak Spanish and 10 speak both Spanish and French.How many people speak atleast one of these two languages? 2

Section-B

- 7) Which of the following sets are finite and which are infinite? 3
Set of concentric circles in a plane.
- 8) Which of the following sets are finite and which are infinite? 3
{x∈R:0<x<1}
- 9) If A = { 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, then insert appropriate symbol ∈ or ∉ in each of the following blank space. 3
-4 ... A
- 10) If A = { 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, then insert appropriate symbol ∈ or ∉ in each of the following blank space. 3
0 ... A
- 11) Write the set of all vowels in English alphabet which precedes 'S'. 3
- 12) If X and Y are two sets such that n(X) = 17, n(Y) = 23 and n(X∪Y) = 38,then find n(X∩Y) 3

Section-C

- 13) Two finite sets have m and n elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. Find the values of m and n. 5
- 14) Out of 100 students, 15 passed in English, 12 passed in Mathematics, 8 in Science, 4 in English and Science, 4 in all the three.Find how many students passed in Mathematics and Science but not in English? 5
- 15) If n(A)=4, n(B)=6, then what can be the minimum number of elements in A∪ B? 5
- 16) If X={1,2,3} and n represents any member of X, write the following sets containing all numbers represented by 4n 5

17) In a group of 65 people, 40 like Cricket, 10 like both Cricket and Tennis only and not Cricket? How many like Tennis? 5

Section-A

1) $A = \{x: x=5 \text{ and } (x-2)(x-5)=0\} = \{5\}$ 2
 $B = \{x: (x-11)(x-5)=0 \text{ and } x=\pm 5\} = \{5\}$
 $C = \{x: -\frac{1}{2} \leq x \leq \frac{1}{2}\}$, $D = \{x: 0 \leq 4x^2 \leq 1\}$
 $= \{x: 0 \leq x^2 \leq \frac{1}{4}\} = \{x: \frac{1}{2} \leq x \leq \frac{1}{2}\}$
 $\therefore C = D$

Ans. A and B are singleton sets, C and D are equal sets.

2) $\{c\}$ 2
 3) U 2
 4) ϕ 2
 5) $n(M \cup P) = 20$, $n(M) = 12$, $n(P \cap M) = 4$ 2
 $\therefore n(M \cup P) = n(M) + n(P) - n(M \cap P)$

Ans. 60

6) $n(F \cup S) = 50 + 20 - 10$ **Ans.** 60 2

Section-B

7) We can draw infinite circles having same centre. 3
 \therefore It is an infinite set.
 8) Given, $\{x \in \mathbb{R}: 0 < x < 1\}$ Here, 0 We know that between any two real numbers, there are infinite real numbers. 3
 \therefore The set $\{x \in \mathbb{R}: 0 < x < 1\}$ is an infinite set.
 9) Given, $A = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ 3
 Since, -4 is not an element of A, therefore $-4 \notin A$
 10) Given, $A = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ 3
 Since, 0 is an element of A, therefore $0 \in A$
 11) The vowels which precedes 's' are a, e, i and o. 3
 So, the required set is $A = \{a, e, i, o\}$.
 12) Given, $n(X) = 17$, $n(Y) = 23$ 3
 and $n(X \cup Y) = 38$
 Clearly, $n(X \cup Y) = n(X) + n(Y) - n(X \cap Y)$
 $\Rightarrow n(X \cap Y) = n(X) + n(Y) - n(X \cup Y)$
 $\Rightarrow n(X \cap Y) = 17 + 23 - 38 = 40 - 38 = 2$

Section-C

13) $2^m = 56 + 2^n \Rightarrow 2^m - 2^n = 56$ 5
Ans. $m=6, n=3$

$$14) n(E \cap S \cap \bar{E}) = n(E \cap S) - n(E \cap M \cap S) \\ = 7 - 4 = 3$$

5

$$15) n(A \cup B) \geq n(B) = 6$$

5

$$16) \{4, 8, 12\}$$

5

$$17) n(T \cup \bar{C}) = n(T) + n(C) - n(T \cap C)$$

5

$$n(T) = 35$$

$$\text{Now, } n(T \cap \bar{C}) = n(T) - n(T \cap C)$$

$$= 35 - 10 = 25$$

Ans. 25, 35

