Sets and Union-Exercise Questions updated on Dec 2024

1.Which of the following set is equivalent to set A= {a,b,c,d,e}

a. B= {1,2,3,4,5} b. B= {c,a,b,f} c. B= {-1,0,2,4} d. None of these

2.If A and B are two sets, then (A-B)UB is……..

a. A b. B c. AUB d. A∩B

3.If A and B are two sets, then (A-B) ∩ B is…….

a. A b. B c. A∩B d.{ }

4.If A⊂B⊂C, then (A-B)U(B-C)U(A-C)=…….

a. A∩B∩C b. AUBUC c. { } d. None of these

5.Find the solution set of the equation $x^2+x+2=0$ in roster form

a. {1,-2} b. { } c. {1,1} d. {1}

6.Find the roster form of the following set

E= The set of all letters in the word TRIGNOMETRY

a. E= {T,R,I,G,N,O,M,E,T,R,Y} b. E= { } c. E={T,R,I,G,N,O,M,E,Y}d. None of these

7.Convert the A= {3,-3}into set-builder form

a. A= {x:x is a positive integer and is a divisor of 19}

b. A= {x:x is an integer and $x^2-9=0$}

c. A= {x:x is an integer and x+1=1}

d. None of these

8.Find the number of elements in the power set of {1,2}

a. 4 b. 0 c. 2 d. None of these

9.B={x:x is an even natural number less than 6}ì A= {x:x is a natural number which divides 36}. Find B in roster form

a. B= {2,3,4,6} b. B= {2} c. { } d. None of these

10.Number of subsets of A= {0}

a. 1 b. 0 c. 2 d. None of these

11. In a class of 120 students numbered 1 to 120, all even numbered students opt for Physics, whose numbers are divisible by 5 opt for Chemistry and those whose numbers are divisible by 7 opt for Math. How many opt for none of the three subjects?

a.19 b.41 c.21 d.26

12. Of the 200 candidates who were interviewed for a position at a call center, 100 had a two-wheeler, 70 had a credit card and 140 had a mobile phone. 40 of them had both, a two-wheeler and a credit card, 30 had both, a credit card and a mobile phone and 60 had both, a two wheeler and mobile phone and 10 had all three. How many candidates had none of the three?

a. 0 b. 20 c. 10 d.18

13. In a class of 40 students, 12 enrolled for both English and German. 22 enrolled for German. If the students of the class enrolled for at least one of the two subjects, then how many students enrolled for only English and not German?

a.30 b. 10 c. 18 d.8

14. In a class 40% of the students enrolled for Math and 70% enrolled for Economics. If 15% of the students enrolled for both Math and Economics, what % of the students of the class did not enroll for either of the two subjects?

a.5% b.15% c. 0% d. 25%

Answer & Explanations

1. Option (a)

Number of elements of A= Number of elements of B

2.c

3.d

4.c

5. Option (a)

(x+2)(x-1)=0

x=-2 or 1

6. Option (c)

Avoid repeated letters

7.b

8. Option (a)

Power set is the set of subsets of {1,2}

That is { {1,2}, {1}, {2}, f}

9.b

10.c

11. Number of students who took at least one of the three subjects can be found by finding out A U B U C, where A is the set of those who took Physics, B the set of those who took Chemistry and C the set of those who opted for Math.

Now, AUBUC = A + B + C - (A n B + B n C + C n A) + (A n B n C)
A is the set of those who opted for Physics = 120/2 = 60 students

B is the set of those who opted for Chemistry = 120/5 = 24
C is the set of those who opted for Math = 120/7 = 17.
The 10th, 20th, 30th…… numbered students would have opted for both Physics and Chemistry.
Therefore, A n B = 120/10 = 12
The 14th, 28th, 42nd…. Numbered students would have opted for Physics and Math.
Therefore, C n A = 120/14 = 8
The 35th, 70th …. Numbered students would have opted for Chemistry and Math.
Therefore, A n B = 120/35 = 3
And the 70th numbered student would have opted for all three subjects.
Therefore, AUBUC = 60 + 24 + 17 - (12 + 8 + 3) + 1 = 79.
Number of students who opted for none of the three subjects = 120 - 79 = 41.

12. Number of candidates who had none of the three = Total number of candidates - number of candidates who had at least one of three devices.

Total number of candidates = 200.
Number of candidates who had at least one of the three = A U B U C, where A is the set of those who have a two wheeler, B the set of those who have a credit card and C the set of those who have a mobile phone.
We know that AUBUC = A + B + C - {A n B + B n C + C n A}+ A n B n C
Therefore, AUBUC = 100 + 70 + 140 - {40 + 30 + 60}+ 10
Or AUBUC = 190.
As 190 candidates who attended the interview had at least one of the three gadgets, 200 - 190 = 10 candidates had none of three.

13. The correct choice is (C) and the correct answer is 18.

Let A be the set of students who have enrolled for English and B be the set of students who have enrolled for German.
Then, (A U B) is the set of students who have enrolled at least one of the two subjects. As the students of the class have enrolled for at least one of the two subjects, A U B = 40
We know A U B = A + B - (A n B)
i.e, 40 = A + 22 - 12
or A = 30 which is the set of students who have enrolled for English and includes those who have enrolled for both the subjects.
However, we need to find out the number of students who have enrolled for only English = Students enrolled for English - Students enrolled for both German and English= 30 - 12 = 18.

14. The correct choice is (A) and the correct answer is 5%.

We know that (A U B) = A + B - (A n B),where (A U B) represents the set of people who have enrolled for at least one of the two subjects Math or Economics and (A n B) represents the set of people who have enrolled for both the subjects Math and Economics.
Note: (A U B) = A + B - (A n B) => (A U B) = 40 + 70 - 15 = 95%
That is 95% of the students have enrolled for at least one of the two subjects Math or Economics.
Therefore, the balance (100 - 95)% = 5% of the students have not enrolled for either of the two subjects.