विद्या सर्वार्थि साधिका

ANANDALAYA
PERIODIC TEST – 1
Class: XI

Subject : Mathematics | M.M :30
Date : 06-08-2022 | Time : 1 hour 30 Min

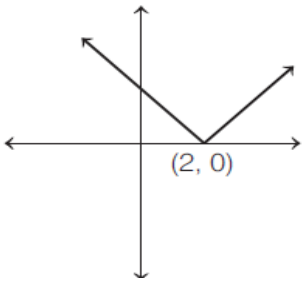
General Instructions:

1. The question paper consists of 14 questions divided into 4 sections A, B, C and D
2. All questions are compulsory.
3. Section A comprises of 5 questions of 1 mark each. Internal choice has been provided in one question.
4. Section B comprises of 4 questions of 2 marks each. Internal choice has been provided in one question.
5. Section C comprises of 3 questions of 3 marks each. An internal choice has been provided in one question.
6. Section D comprises of 2 questions of 4 marks each. An internal choice has been provided in one question.

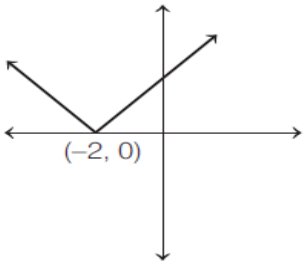
SECTION – A

1. Write the set of all natural numbers x such that $4x + 9 < 50$ in roster form. (1)

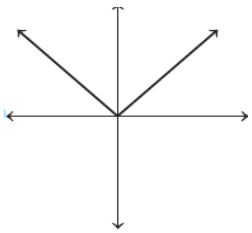
2. The graph of the functions $(x) = |x - 2|$ is_____. (1)



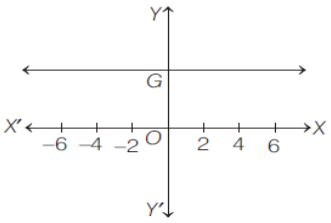
(A)



(B)



(C)



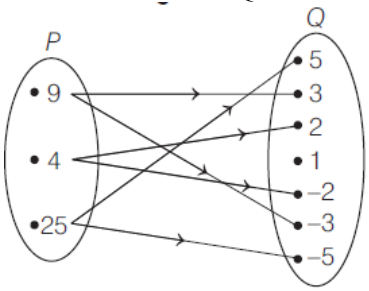
(D)

3. If A = the set of letters in 'ALLOY' and B = the set of letters in 'LOYAL', then AαB. Here, α refers to _____. (1)
(A) equal (B) unequal (C) disjoints (D) None of these

4. If $A \times B = \{(a, 1), (b, 3), (a, 3), (b, 1), (a, 2), (b, 2)\}$. Then write the sets A and B. (1)

OR

The figure shows a relation R between the sets P and Q. Write the relation R in roster form.



5. List the elements of the following set $\{x: x = \frac{n}{n^2+1}\ and\ 1 \leq n \leq 3, where\ n \in N\}$. (1)

SECTION – B

6. If a relation R is defined on the set Z of integers as follows$(a, b) \in R \Leftrightarrow a^2 + b^2 = 25$, then write the domain of R. (2)

7. A survey shows that 73% of the Indians like apples, whereas 65% like oranges. What % Indians like both apples and oranges? (2)

OR

Draw Venn diagram for $(A \cap B)'$.

8. If A = {1, 2, 5, 6} and B = {1, 2, 3}, then find the value of (A $\times$B) $\cap$(B $\times$A). (2)

9. If A = {2, 4, 6, 8} and B = {6,8,10,12}, then find A $\cup$B and A $\cap$ B. (2)

SECTION – C

10. Find the domain of the function for which $f(x) = g(x), if\ f(x) = 3x^2 + 1, and\ g(x) = 7x - 1.$ (3)

OR

If $f(x) = \begin{cases} x^2, & x < 0 \\ x, & 0 \leq x < 1 \\ \frac{1}{x}, & x \geq 1 \end{cases}$ then find the value of $f\left(\frac{1}{2}\right) + f(2)$.

11. If A = {1, 3, 5, 6} and B = {3, 4, 5}, write the relation R as a set of ordered pairs, if (3)
(i) R = {(x, y): (x, y) $\in$ A x B: x + y is even}.
(ii) R = {(x, y): (x, y) $\in$ A x B: x y is odd}.

12. Let A and B be two sets such that $n(A^c) = 0.84, n(B^c) = 0.86$ and $n(A \cup B) = 0.25$. Then, find the value of $n(A \cap B)$. (3)

SECTION – D

13. Find the domain and range of the following functions: (4)
(i) $f(x) = \frac{x}{1+x^2}$.
(ii) $g(x) = \sqrt{a^2 - x^2}$.

14. In a town of 10,000 families it was found that 40% families buy newspaper 'A', 20% families buy newspaper 'B', 10% families buy newspaper 'C'. 5% of families buy newspaper 'A' and 'B', 3% of families buy newspaper 'B' and 'C' and 4% of families buy newspaper 'A' and 'C'. If 12% of families buy all the three newspaper find; (4)
(i) the number of families which buy newspaper 'A' only.
(ii) the number of families which buy none of the newspapers 'A', 'B' and 'C'.

OR

Two finite sets have m and n elements.The number of subsets of the first set is 112 more than that of the second set. Find the values of m and n.