SHIKSHA CLASSES

Subject : Algebra **Marks : 40**

Class : X **Prelim Question Paper - 2** **Time : 2 Hr.**

Q.1 A. Choose the correct alternative **4**

1) If for any A.P. d = 5 then

$t_{18} - t_{13}$ = ...

a) 5 b) 20

c) 25 d) 30

2) Which number cannot represent a probability ?

a) $\frac{2}{3}$ b) 1.5

c) 15 % d) 0.7

3) Find the value of $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$.

a) –1 b) –41

c) 41 d) 1

4) A letter is chosen from the word APALA. Find the probability of choosing letter A.

a) $\frac{1}{5}$ b) $\frac{2}{5}$

c) $\frac{3}{5}$ d) $\frac{4}{5}$

B. Solve of the following sub questions. **4**

1) If n(A) = 2, P(A) = $\frac{1}{5}$, then n(S) = ?

2) To solve x + y = 3; 3x – 2y – 4 = 0 by determinant method find D.

3) Check the sequence is A.P. or not if A.P. Find the common difference.

$3, 3+\sqrt{2}, 3+2\sqrt{2}, 3+3\sqrt{2}, \ldots$

4) Determine nature of roots of the quadratic equations $x^2 + 2x - 9 = 0$.

Q.2 A. Solve Any TWO of the following **4**

1) From a 'Road safety committee' of two from two boys (B_1, B_2) and two girls (G_1, G_2) complete the following activity to write the sample space.

a) Committee of 2 boys = $\{B_1, B_2\}$

b) Committee of 2 girls = $\{\quad\}$

c) Committee of one boy and one girl

= $\{\quad\}$

sample space S = { }

2) Complete the following activity to solve the simultaneous equations

5x + 3y = –11,

2x + 4y = – 10 by cramer's rule.

$D = \begin{vmatrix} 5 & 3 \\ 2 & 4 \end{vmatrix} = 14$

$Dx = \begin{vmatrix} -11 & 3 \\ -10 & 4 \end{vmatrix} = \square$

$Dy = \begin{vmatrix} 5 & -11 \\ 2 & -10 \end{vmatrix} = \square$

$x = \frac{\square}{\square} = \square$

$y = \frac{\square}{\square} = \square$

3) If $x = 5$ is the root of $kx^2 - 14x - 5 = 0$ then find the value of k.

One root of $kx^2 - 14x - 5 = 0$ is $\square$

$\therefore$ Put $x = \square$ in the above equation

$\therefore$ $k\square^2 - 14\square - 5 = 0$

$\therefore$ $25k - 70 - 5 = 0$

$\therefore$ $25k - \square = 0$

$\therefore$ $25k = \square$

$k = \frac{\square}{\square} = 3$

Q. 2 B. Solve Any FOUR of the following 8

1) Solve by cramer's rule

$4m - 2n = -4$;

$4m - 3n = 16$

2) Two coins are tossed simultaneously.

Find the probability of getting only Head.

3) Solve the following quadratic equation by using formula method.

$y^2 + \frac{1}{3}y = 2$.

4) Find the fourth term from the end of the A.P. $-11, -8, -5, ---, 49$

5) Solve the simultaneous equation

$15x + 17y = 21$, $17x + 15y = 11$.

Q. 3 A) Complete the following activity

(Any ONE) 3

1) $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ to solve this quadratic equation by factorisation, complete the following activity.

$\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

$\sqrt{2}x^2 + \square + \square + 5\sqrt{2} = 0$

$x(\square) + \sqrt{2}(\square) = 0$

$(\square) + (x + \sqrt{2}) = 0$

$(\square) = 0$ or $(x + \sqrt{2}) = 0$

$x = \square$ or $x = -\sqrt{2}$

$\therefore \square$ and $-\sqrt{2}$ are roots of the equation.

2) Find the 31st term of an AP whose 11th term is 38 and 16th term is 73.

$t_{11} = 38$

$t_{16} = 73$

$t_n = a + (n - 1)d$

$t_{11} =$

$t_{11} = a + 10d$

$a + 10d = 38$ ---(i)

$t_{16} = a + (n - 1)\,d$

$t_{16} = a + (16 - 1)\,d$

$73 = a + 15\,d$

$= 73$ ---(ii)

Substracting

$a + 10d = 38$

$-\ a + 15d = 73$

$-5d = -35$

$d = +\frac{35}{5}$

$d =$

$a + 10d = 38$

$a + 10(\square) = 38$

$a + 70 = 38$

$a = 38 - 70$

$a =$

$t_{31} = a + (n-1)d$

$t_{31} = -32 + (31-1)7$

$= -32 + 30 \times 7$

$= -32 + 210$

$= \square$

$t_{31} = \square$.

Q. 3 B) Solve Any TWO from the following subquestion. 6

1) A two digit number is formed with digits 2, 3, 4, 7, 9 without repetition. What is probability that the number is formed

   i) an odd Number

   ii) a multiple of 5

2) Find the value of

   i) $\begin{vmatrix} 5 & 3 \\ -7 & 0 \end{vmatrix}$

   ii) $\begin{vmatrix} \frac{7}{3} & \frac{5}{3} \\ \frac{3}{2} & \frac{1}{2} \end{vmatrix}$

3) Solve by factorisation method

   $m^2 - 11 = 0$

4) The sum of the first n natural numbers is given by $S = \frac{n(n+1)}{2}$ Find n if the sum is 276.

Q. 4 Solve Any TWO from the following subquestion. 8

1) The sum of two digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2 find the number.

2) If the sum of first p terms of an A.P. is equal to the sum of first q terms then show that the sum of its first (p + q) terms is zero. ($p \neq q$)

3) A die is thrown once find the probability of getting

   (i) a prime number

   (ii) A number lying between 2 and 6

   (iii) an odd number

Q. 5 Solve any ONE from the following subquestion 3

1) The denominator of a fraction is 4 more than twice its numerator. Denominator becomes 12 times the numerator, if both the numerator and the denominator are reduced by 6. Find the fraction.

2) Two dice one blue and one grey are thrown at the same time. Write down all possible outcome. What is the probability that the sum of the two numbers appearing on the top of the dice is (i) 8 (ii) 13.

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