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Note:-
1. All questions are compulsory.
2. Use of a calculator is not allowed.
3. The numbers to the right of the questions indicate full marks.
4. In case of MCQ, Q NO.1 (A) only the first attempt will be evaluated and will be given credit.
5. For every MCQ, the correct alternative (A), (B), (C) or (D) of answers with sub question number is to be written as an answer.

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Q. 1 A] For every subquestion 4 alternative answers are given. Choose the correct answer and write the alphabet of it. **(4)**

   (i) $ax + by = c$ and $mx + ny = d$ and $an \neq bn$ then these simultaneous equations have ,
   (A) Only one common solution. (B) No solution
   (C) Infinite number of solutions (D) Only two solutions.

   (ii) $\sqrt{5}m^2 - \sqrt{5}\ m + \sqrt{5} = 0$
   Which of the following statements is true for this given equation?
   (A) Real and unequal roots   (B) Real and equal roots
   (C) Roots are not real   (D) Three roots

   (iii)   In an A. P. first two terms are -3, 4 then 21st term is…………
   (A) - 143   (B) 143   (C) 13.7   (D) 17

   (iii)   A die is rolled. What is the probability that the number appearing
   On upper face is less than 3?
   (A) $\dfrac{1}{6}$ (B) $\dfrac{1}{3}$ (C) $\dfrac{1}{2}$ (D) 0

B] Solve the following sub questions. (4)

   (i)   Write any two quadratic equations.

   (ii)   Check whether the following sequence is an A.P. If it is an A.P. , find the common difference.

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

   (iii) Find the value of the following determinant

$$\begin{vmatrix} 5 & -2 \\ -3 & 1 \end{vmatrix}$$

   (iv) If two coins are tossed simultaneously, write the sample space.

Q. 2 A) Complete and write any two activities from the following: (4)

 (i) Complete the following table.

Quadratic equation	General form	a	b	C
$y^2 = 2y - 7$				

 (ii) Find the sum of n numbers, where a = 1, d = 2, n = 75

    Solution

    $S_n = \dfrac{n}{2} [2a + \boxed{} d]$

    $S_n = \boxed{}$

    $S_n = \boxed{} \times 150$

    $S_n = \boxed{}$

 (iii) Find the factors of the following polynomial.

    $x^2 - 4x - 5$

    Solution :- $x^2 - 4x - 5$

        $= x^2 - \boxed{} + 1x - 5$

        $= x \boxed{} + 1(x - 5)$

        $= \boxed{}\boxed{}$

B) Solve any four sub questions from the following. **(8)**

i)   Find k if $x = 3$ is a root of equation $kx^2 - 10x + 3 = 0$

ii)   Determine the nature of roots of the following quadratic equation.
$2y^2 - 7y + 2 = 0$

iii)   Solve the following quadratic equation by factorization.
$m^2 - 14m + 13 = 0$

iv)   Given Arithmetic progression is 12, 16, 20, 24, ………….
Find the 24th term of this progression.

v)   Form two equations using variable a and b whose solution
is (0, 2)

3   A)   Complete and write any one activity from the following.   **(3)**

1)   Solve the following using formula method.

$2x^2 + 13x + 15 = 0$

Solution: $2x^2 + 13x + 15 = 0$

Here a = ☐ , b = 13, c = 15

$b^2 - 4ac = (13)^2 - 4 \times 2 \times$ ☐

$\qquad = 169 - 120 = 49$

$X = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$\therefore X = \dfrac{-\boxed{} \pm \sqrt{49}}{4}$

$\therefore X = \dfrac{-13 \pm \boxed{}}{4}$

$\therefore X = \dfrac{6}{4} \qquad \therefore X = \dfrac{-20}{4}$

$\therefore X = $ ☐   or $X = $ ☐

2) Find 2 digit numbers which are divisible by 5.

Solution:-

Two digit numbers divisible by 5 are

10, 15, 20, 25 ………….. 95

Here a = 10, d = 5, t_n = 95, n = ?

Now t_n = a + (n – 1) ☐

∴ ☐ = 10 + (n – 1) x 5

☐ = (n – 1) x 5

☐ = (n – 1)

∴ n = ☐

∴ ☐ two digit numbers are divisible by 5.

B) **Attempt any two sub questions from the following.** **(6)**

(i) A two digit number is to be formed from the digits 0, 1, 2, 3, 4. Repetition of the digits is allowed. Find the probability that the number so formed is a multiple of 4.

(ii) Solve the following simultaneous equations graphically.

2x – 3y = 4; 3y – x = 4

(iii) Solve using formula: $5x^2$ + 13x + 8 = 0.

(iv) Find 'm' if (m – 12) x^2 + 2 (m – 12) x + 2 = 0 has real and equal roots.

Q.4) **Attempt any two sub questions from the following.** **(8)**

(i) Sum of first 55 terms in an A.P. is 3300, find its 28th term.

(ii) A balloon vendor has 2 red, 3 blue and 4 green balloons. He wants to choose one of them at random to give it to Pranali. What is the probability of the event that Pranali gets.

i) a red balloon   ii) a blue balloon.

(iii)   Kantabai bought $1\frac{1}{2}$ kg tea and 5kg sugar from a shop. She paid ₹ 50 as return fair for rickshaw. Total expense was ₹ 700. Then she realised that by ordering online the goods can be bought with free home delivery at the same price. So next month she placed the order online for 2kg tea and 7kg sugar. She paid ₹ 880 for that. Find the rate of a sugar and tea per kg.

Q. 5) Attempt any one subquestion from the following .   **(3)**
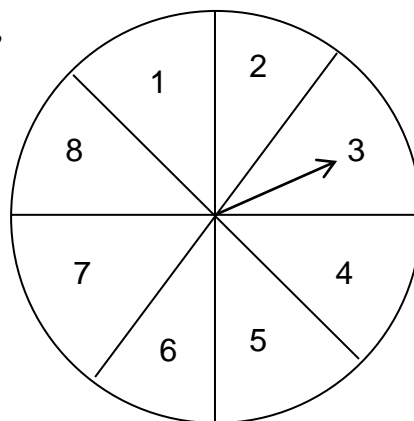
(i)   Form equations using the given information.

$$D = \begin{vmatrix} 4 & -3 \\ 2 & 5 \end{vmatrix} \qquad Dx = \begin{vmatrix} 5 & -3 \\ 9 & 5 \end{vmatrix} \qquad Dy = \begin{vmatrix} 4 & 5 \\ 2 & 9 \end{vmatrix}$$

(ii)   In a game of chance a spinning arrow comes to rest at one of the numbers 1, 2, 3, 4 5, 6, 7, 8
All these are equally likely outcomes.
Find the probability that it will rest at,
i)   an odd number
ii)   a number less than 9

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