PVG's
Muktangan English School & Jr. College, Pune - 9
Unit Test I (2024-25)
Standard - X

Subject - Mathematics (Part - I)   **Marks - 20**
Date - 8.8.2024   **Time - 9.30 a.m. to 10.45 a.m.**

Q.I (A) For each question, four alternatives are given. Choose the correct   **(2)**
alternative and write the correct alphabet to indicate the answer.

1) In an A.P., if t_3 = -1 and t_4 = -6; then find value of 'd'.

   (A) 5   (B) -5   (C) 7   (D) -7

2) Identify the linear equation in two variables from the following.

   (A) $\sqrt{3}\,x + \sqrt{5}\,y = 0$ (B) 5x - 2y = 6z

   (C) $\dfrac{4}{x} + \dfrac{5}{y} = 4$ (D) $3x^2 - 7y = 13$

(B) Attempt the following subquestions.   **(2)**

1) To draw graph of 4x + 5y = 19, find y if x = 1.

2) Find first term of the sequence t_n = 3n - 2.

Q. II (A) Attempt any one of the following activities.   **(2)**

1) If (0, 2) is solution of 2x + 3y = k, then to get value of k, complete the
   following activity.

   Solution :

   (0,2) is the solution of equation 2x + 3y = k .... (1)

   $\therefore$ substituting x = ☐ & y = 2 in equation (1), we get

   2 X ☐ + 3 X 2 = ☐

   On solving, we get k = ☐

2) First term and common difference of an A. P. are 6 & 3 respectively. Find S_{27} by
   completing the following activity.

   Given : a = 6, d = 3

   To find S_{27} = ?

   Solution :

   $S_n = \dfrac{n}{2}\,[\,☐\, + (n-1)\,d]$ .... (Formula for S_n)

   $\therefore S_{27} = \dfrac{27}{2}\,[12 + (27-1)☐\,]$
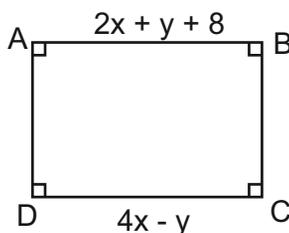
   $\therefore S_{27} = \dfrac{27}{2} \times ☐$

   $\therefore S_{27} = ☐$

(B) Attempt any two of the following subquestions.   **(4)**

1) ▱ABCD is a rectangle.
    Write simultaneous equation
    in the form ax + by = c,
    stating the reason,
    using the information
    given in the figure alongside.

$$A \quad \overset{2x + y + 8}{\square} \quad B$$

$$D \quad \underset{4x - y}{\square} \quad C$$

2) Find 21st term of the following AP :   7, 13, 19, 25, ...

3) Using Cramers rule, find value of 'x' for the simultaneous equations
    3x - 4y = 10 and 4x + 3y = 5.

Q.III (A) Attempt any one of the following activities.   **(3)**

1) If 99x + 101y = 499 and 101x + 99y = 501, then find value of x + y by completing
    the following activity.

    Solution :

    Let 99x + 101 y = 499 .... (1)

    　　101x + 99y = 501 .... (2)

    On $\boxed{}$ equation (1) and (2), we get

    $\boxed{}$ x + $\boxed{}$ y = $\boxed{}$ .... (3)

    On dividing equation (3) by $\boxed{}$ and simplifying, we get

    x + y = $\boxed{}$

2) In an AP, 17th term is 7 more than 10th term. Find the common difference by
    completing the following activity.

    Solution :

    Let first term of an AP be 'a' and the common difference be 'd'.

    According to the given condition,

    $t_{17} = t_{10} + \boxed{}$

    $\therefore$ a + (17-1) d = a + (10-1) d + $\boxed{}$ .... [By using formula t_n = a + $\boxed{}$ d]

    $\therefore$ a + 16 d = a + 9d + $\boxed{}$

    　On rearranging we get

    a + 16 d - a - 9d = $\boxed{}$

    On solving we get

    d = $\boxed{}$

(B) **Attempt any one of the following subquestions :** **(3)**

1) Find four consecutive terms of an A.P. whose sum is 12 and sum of third and fourth term is 14.

2) Solve $\dfrac{4}{x} + \dfrac{5}{y} = 7$ and $\dfrac{3}{x} + \dfrac{4}{y} = 5$

Q.IV Attempt any one of the following subquestions: **(4)**

1) If first term of an A.P. is 'a', second term is 'b' and last term is 'c',

then prove that sum of all terms = $\dfrac{(a+c)\ (b+c-2a)}{2(b-a)}$

2) Anand gave Anushka some 100 rupees and some 50 rupees notes, which amounts to Rs. 2500. If Anand would have given Anushka the amount, by interchanging the number of notes, she would have received Rs. 500 less than previous amount. Find the number of notes of each type given initially to Anushka by Anand.

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