EDUTECH ACADEMY
NURTURING THE FUTURE...
— Classes 5 to 10 —

N 926

SET B

Seat No. | | | | | | | |

2025 XII 26 1100 – N 926 – MATHEMATICS (71) GEOMETRY – PART I (E)

(NEW COURSE)

Time : 2 Hours **(Pages 10)** **Max. Marks : 40**

Q.1 (A) Choose the correct alternative: **4**

(1) To draw graph of $4x + 5y = 19$, Find y when x = 1.

(a) 4 (b) 3 (c) 2 (d) -3

(2) What is the probability of the event that a number chosen from 1 to 100 is a prime number ?

(A) $\frac{1}{5}$ (B) $\frac{6}{25}$ (C) $\frac{1}{4}$ (D) $\frac{13}{50}$

(3) A committee of 3 members from 3 boys and 3 girls is created for a NGO work, write event and number of sample points to form committee of at most 1 boy.

(a) n(A) = 9 (b) n(A) = 12 (c) n(A) = 15 (d) n(A) = 10

(4) For simultaneous equation in variable x and y, $D_x = 66$, $D_y = 121$, D= 11 then what is the value of x

(a) 6 (b) – 6 (c) $\frac{1}{6}$ (d) $-\frac{1}{6}$

(B) Solve the following: **4**

(1) Find the first term and common difference for each of the A.P: 0.6, 0.9, 1.2, 1.5, . . .

(2) FV = Rs. 100, premium = Rs. 65 then MV = ?

(3) If $17x + 15y = 11$ and $15x + 17y = 21$, then find the value of x – y.

(4) A bag contains 50 cards. Each card bears only one number from 1 to 50. One card is drawn at random from the bag. Write the sample space. Also write the events A, B and find the number of sample points in them.

(i) Condition for event A : the number on the card is divisible by 6.

(ii) Condition for event B : the number on the card is a complete square.

Q.2(A) Complete the following activities:(Any TWO) **4**

(1) The percentage of marks of 50 students in a test is given in the following table. Find the mean of the percentage.

Percentage of marks	0 - 20	20 - 40	40 - 60	60 - 80	80 – 100
No. of students	3	7	15	20	5

The following table is prepared as per steps.

Class (Percentage of marks)	Class mark x_i	Frequency (No. of students) f_i	Class mark × frequency $x_i f_i$
0–20	10	3	30
20–40	30	7	210
40–60	50	15	750
60–80	70	20	1400
80–100	90	5	450
Total		$N = \sum f_i = 50$	$\sum x_i f_i =$ ☐

$\overline{X} =$ ☐

$=$ ☐ / 50

$=$ ☐

∴ The mean of the percentage = 56.8

(2) Solve the following quadratic equation by completing the square method: $2y^2 + 9y + 10 = 0$

First divide the equation by 2 so that coefficient of y^2 becomes 1.

$\rightarrow \frac{2}{2} y^2 + \frac{9}{2} y +$ ☐ $= \frac{0}{2}$

$\rightarrow y^2 + \frac{9}{2} y + 5 = 0$

To solve the quadratic equation $y^2 + \frac{9}{2} y + 5 = 0$ by method of completing square, add and subtract square of the half of coefficient of 'y'

Added/ Subtracted value $= \left(\frac{1}{2} \times \frac{9}{2}\right)^2$

$=$ ☐^{2}

$\therefore y^2 + \frac{9}{2} y + \left(\frac{9}{4}\right)^2 - \left(\frac{9}{4}\right)^2 + 5 = 0$

$\rightarrow y^2 +$ ☐ $\left(\frac{9}{4}\right) + \left(\frac{9}{4}\right)^2 = -\left(\frac{9}{4}\right)^2 - 5$

$\rightarrow (y + \frac{9}{4})^2 =$ ☐ $- 5$

$\rightarrow (y+\frac{9}{4})^2=\left(\frac{1}{4}\right)^2$

Taking square roots

$\rightarrow y+\frac{9}{4}=\frac{1}{4}$ or $y+\frac{9}{4}=-\frac{1}{4}$

$\rightarrow y=\frac{1}{4}-\frac{9}{4}$ or $y=-\frac{1}{4}-\frac{9}{4}$

$\rightarrow y=\frac{-8}{4}$ or $y=\frac{-10}{4}$

$\rightarrow y=-2$ or $y=\frac{-5}{2}$

$\therefore$ -2 and $\frac{-5}{2}$ are roots of the quadratic equation

(3) The following table shows the income of farmers in a grape season. Find the mean of their income.

Income (Thousand rupees)	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 – 80
Farmers	10	11	15	16	18	14

Let us assume mean method to find mean. Let a = 55

Income (Rs.)	x_i	No. of farmers (fi)	$u_i = x_i - a$	f_iu_i
20 – 30	25	10	-30	-300
30 – 40	35	11	-20	-220
40 – 50	45	15	-10	- 150
50 – 60	55	16	0	0
60 – 70	65	18	10	180
70 - 80	75	14	20	280
		$\sum fi = 84$		$\sum_i u_i =$ ☐

$\therefore$ Mean = a + ☐

= 55 + ☐

= 55 – ☐

$\bar{x} = 52.5$

$\therefore$ Mean income of farmers is Rs. 52.5 thousand or Rs. 52500

(B) Solve the following: (Any FOUR) **8**

(1) A two digit number is formed with digits 2, 3, 5, 7, 9 without repetition. What is the probability that the number formed is an odd number?

(2) In year 2015, Mrs. Shaikh got a job with salary Rs. 1,80,000 per year. Her employer agreed to give Rs. 10,000 per year as increment. Then in how many years will her annual salary be Rs. 2,50,000?

(3) Solve the following quadratic equation by factorisation: $2y^2 + 27y + 13 = 0$

(4) 'Chetana Store' paid total GST of Rs. 1,00,500 at the time of purchase and collected GST Rs. 1,22,500 at the time of sale during 1st of July 2017 to 31st July 2017. Find the GST payable by Chetana Stores.

(5) Obtain the A.M of the following data.

Score, x	Frequency, f
5	4
10	5
15	7
20	4
25	3
30	2

Q.3 (A) Complete the following activity:(Any ONE) **3**

(1) Solve the following simultaneous equation using Cramer's rule.

6x - 4y = -12; 8x - 3y = -2

Given equations are

$6x - 4y = -12$

$8x - 3y = -2$

$D = \begin{vmatrix} 6 & -4 \\ 8 & -3 \end{vmatrix}$

$= 6(-3) - 8(-4)$

$= -18 + 32$

$= 14$

$D_x = \begin{vmatrix} -12 & -4 \\ -2 & -3 \end{vmatrix}$

$= -12(-3) - (-2)(-4)$

$= \square - 8$

$= \square$

$D_y = \begin{vmatrix} 6 & -12 \\ 8 & -2 \end{vmatrix}$

$= 6(-2) - 8(-12)$

$= -12 + 96$

$= \square$

$x = \frac{D_x}{D}$

$= \frac{28}{14}$

$= \square$

and

$y = \frac{D_y}{D}$

$= \square$

$= \square$

(2) The following frequency distribution table shows the classification of the number of vehicles and the volume of petrol filled in them. Find the mode of the volume.

Petrol filled (Litre)	1 - 3	4 - 6	7 - 9	10 - 12	13 – 15
No. of vehicle	33	40	27	18	12

The given classes are not continuous. So, let us make them continuous and rewrite the table.

Class	Continuous classes	Frequency
1–3	0.5–3.5	$33 \rightarrow f_0$
4–6	3.5–6.5	$40 \rightarrow f_1$
7–9	6.5–9.5	$27 \rightarrow f_2$
10–12	9.5–12.5	18
13–15	12.5–15.5	12

From the above table, the modal class is ☐

$$\text{Mode} = L + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$$

$$\text{Mode} = 3.5 + \left[\frac{40-33}{2(40)-33-27}\right] \times h$$

$$= 3.5 + \left[\frac{7}{\square}\right] \times \square$$

$$= 3.5 + \square$$

$$= 3.5 + \square$$

$$= \square$$

(B) Solve the following: (Any TWO) **6**

(1) Out of 200 students from a school, 135 like Kabbaddi and the remaining students do not like the game. If one student is selected at random from all the students, find the probability that the student selected doesn't like Kabbaddi.

(2) Arati Gas Agency supplied LPG cylinder to the consumer for taxable value of Rs. 545. GST charged is 5%. What is the amount of CGST and SGST in the tax invoice ? What is the total amount paid by the consumer ? Find the amount of GST to be paid by Arati Gas Agency.

(3) Solve the following quadratic equation by completing the square method: $m^2 - 5m = -3$

(4) Write sample space 'S' and number of sample point n(S) for each of the following experiments. Also write events A, B, C in the set form and write n(A), n(B), n(C): Two digit numbers are formed using digits 0, 1, 2, 3, 4, 5 without repetition of the digits.

Condition for event A : The number formed is even

Condition for event B : The number formed is divisible by 3.

Condition for event C : The number formed is greater than 50.

Q.4 Solve the following: (Any TWO) **8**

(1) In a class test the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in two subjects.

(2) There is an auditorium with 27 rows of seats. There are 20 seats in the first row, 22 seats in the second row, 24 seats in the third row and so on. Find the number of seats in the 15th row and also find how many total seats are there in the auditorium?

(3) A tank fills completely in 2 hours if both the taps are open. If only one of the taps is open at the given time, the smaller tap takes 3 hours more than the larger one to fill the tank. How much time does each tap take to fill the tank completely ?

Q.5 Solve the following: (Any ONE) **3**

(1) When the son will be as old as his father today, the sum of their ages then will be 126. When the father was as old as his son is today, the sum of their ages then was 38. Find their present ages.

(2) Following table gives frequency distribution of time (in minutes) taken by a person in watching T.V. on a day

Time (in min)	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
Number of persons	4	6	19	14	8	7	2

Obtain modal time taken for watching a T.V. by persons on a day.

....All The Best....