ST. JOSEPH STUDY CENTRE

12th STD: Unit Test-2 **MATHEMATICS** **Time: 1 Hr / Total Marks: 25**

I. Answer the following questions: **[3 x 2 = 6]**

1. Solve the system of linear equation by Cramer's rule.

   $3x + 3y – z = 11$; $2x – y + 2z = 9$; $4x + 3y + 2z = 25$

2. Solve the system of linear equation by Gauss elimination method.

   $4x + 3y + 6z = 25$; $x + 5y + 7z = 13$; $2x + 9y + z = 1$

3. Test the consistency of the system of linear equation and if possible solve:

   $x + y + z = -9$; $2x – 2y + 2z = -18$; $3x – 3y + 3z + 27 = 0$

II. Answer the following questions: **[3 x 3 = 9]**

4. A chemist has one solution which is 50% acid and another solution which is 25% acid. How much each should be mixed to make 10 litres of a 40% acid solution? [Use Cramer's rule to solve the problem]

5. If $ax^2 + bx + c$ is divided by $x + 3$, $x – 5$ and $x - 1$, the remainders are 21, 61 and 9 respectively. Find a, b and c. [Use Gaussian elimination method]

6. Solve the following system of homogenous equations,

   $x + y – 2z = 0$, $2x – 3y + z = 0$, $3x – 7y + 10z = 0$, $6x – 9y + 10z = 0$

III. Answer the following questions: **[2 x 5 = 10]**

7. Investigate the values of λ and μ if the system of linear equations,

   $x + 2y + z = 7$; $x + y + \lambda = \mu$; $x + 3y – 5z = 5$ has

   (i) No solution, (ii) A unique solution, (iii) An infinite number of solutions

8. By using Gaussian elimination method, balance the chemical reaction equation.

   $C_2H_6 + O_2 \rightarrow H_2O + CO_2$

----------ALL THE BEST----------

Test should be written under the supervision of your parents and get the answer paper signed from them.

No corrections should be made after the test timings. We expect your honesty.

Test Papers have to be submitted after the completion of all the 4 tests.

Submission Date of Test Papers: 1st July, 2nd July, 3rd July Timings: 9 AM – 12.30 PM / 5 PM- 7 PM