

## Subject: Engineering Mathematics

DPP-01

## Chapter: Numerical Methods

## Topic : Numerical Solution of Linear Equation

1. Solve the following equations by Jacobi method  
 $20x + y - 2z = 17;$        $3x + 20y - z = -18;$   
 $2x - 3y + 20z = 25$   
 Assuming initial guess  $x_0 = y_0 = z_0 = 0$ , the value of  $x$  after first approximation is \_\_\_\_\_
2. Solve the system of equations by Gauss-Seidal interactive method  
 $54x + y + z = 110$   
 $2x + 15y + 6z = 72$   
 $-x + 6y + 27z = 85$   
 What is the value of  $z$  after second approximation?
3. Solve by Jacobi's method.  
 Assuming initial guess  $x_0 = y_0 = z_0 = 0$ , the value of  $y$  after first approximation is \_\_\_\_\_  
 $4x + y + 3z = 17;$        $x + 5y + z = 14;$   
 $2x - y + 8z = 12$
4. Solve the following system of equations using Gauss-Seidal interactive method  
 $2x + 10y + z = 51$   
 $10x + y + 2z = 44$   
 $x + 2y + 10z = 61$   
 What is the value of  $z$  after first approximation?
5. Use Gauss-Seidal interactive method to solve the following equations as  
 $9x + 4y + z = -17$   
 $x - 2y - 6z = 14$   
 $x + 6y = 4$   
 What is the value of  $y$  after second approximation?
6. Gauss-Seidel method is used to solve the following equations (as per the given order):  
 $x_1 + 2x_2 + 3x_3 = 5$   
 $2x_1 + 3x_2 + x_3 = 1$   
 $3x_1 + 2x_2 + x_3 = 3$   
 Assuming an initial guess as  $x_1 = x_2 = x_3 = 0$ , the value of  $x_3$  after the first iteration is \_\_\_\_\_.
7. The approximate solution of the system of simultaneous equations  
 $5x - 2y + z = -1$   
 $3x + 4y - 2z = 2$   
 $4x - y + 3z = 4$   
 by applying Gauss-Jacobi method one time (using initial approximation) as  $x = 0, y = 0, z = 0$  will be:  
 (a)  $x = 1.25, y = 2.275, z = -3.72$   
 (b)  $x = -1.5, y = 3.25, z = 1.275$   
 (c)  $x = 1.5, y = -2.375, z = 2.234$   
 (d)  $x = -0.2, y = 0.5, z = 1.33$
8. Solve by Gauss-Seidal method, the following system  
 $28x + 4y - z = 32;$        $x + 3y + 10z = 24;$   
 $2x + 17y + 4z = 35$   
 What is the value of  $z$  after second approximation?

## Answer Key

- |            |             |
|------------|-------------|
| 1. (0.85)  | 5. (0.9991) |
| 2. (2.406) | 6. (-6)     |
| 3. (2.8)   | 7. (d)      |
| 4. (4.816) | 8. (1.8497) |



Any issue with DPP, please report by clicking here:- <https://forms.gle/t2SzQVvQcs638c4r5>

For more questions, kindly visit the library section: Link for web: <https://smart.link/sdfez8ejd80if>

Link for Telegram: <https://t.me/ChetanIITR>



PW Mobile APP: <https://smart.link/7wwosivoicgd4>